

Medicine prices matter

Rapidly rising costs of health care and high medicine prices are a growing concern worldwide, especially in countries where patients often have to pay the full price of medicines. The burden is greatest for people with non-communicable diseases (NCDs) that require life-long treatment. This report about the prices and affordability of medicines to treat NCDs in Egypt is an outcome of a series of surveys carried out in the World Health Organization's (WHO) Eastern Mediterranean region using a standard survey methodology developed by the WHO and Health Action International (HAI)ⁱ.

Egypt survey

This survey in Egypt was conducted in September 2013 by the Ministry of Health. The survey manager was Mr. Yasin Afify. Support was provided by the World Bank, WHO's Eastern Mediterranean Regional Office and HAI.

The survey was designed to answer the following questions on medicines to treat NCDs:

- What is the patient price for key NCD medicines in private pharmacies?
- How affordable are medicines for low-income people, for the treatment of common NCDs?
- Do prices and affordability for NCD medicines vary within and across sectors (for originator brands, most sold generic and lowest priced generics), and in different regions of the country?
- What price does the government pay for medicines?
- How do prices compare with international reference prices?
- What is the out-of-pocket payment for each medicine procured?

Pharmaceutical sector in Egyptⁱⁱ

Egypt is a large country in terms of size (1,009,500 sq. km) as well as population (approximately 82.5 million people in 2012). Of these, 43% live in urban areas. Health expenditure as a share of GDP was 4.9% (2011). In 2011, 6.9% of the government budget was spent on health. Per capita government spending on health was estimated at \$55 in 2011. Out-of-pocket expenditure was 58.2% of total health expenditure (2011). There are 119 local medicine manufacturers.

The Egyptian Drug Authority (EDA) of the MOH undertakes medicines regulatory activities. Medicinal products must have marketing approval (registration) before importation or before being sold (although waivers/exceptions do exist).

The MOH Central Administration for Pharmaceutical Affairs Pricing Committee regulates patient prices in the private sector. As per the regulations, for originator brands the price is set at the lowest price in all countries in which the product is marketed. If it is marketed in less than five countries, the results of a comparative study are taken into account as well as the lowest price in the countries in which the product is marketed. The first five generic equivalent products to the market are priced at 65% of the originator product price. Further generics are priced at 60% of the originator product price. A high-tech generic imported from a reference country is priced at 70% of the originator product price; if from a non-reference country then the price is set at 65% of the originator product price. In procuring medicines, the MOH has a 15% local preference policy.

Egypt's public health system / social health insurance scheme covers approximately 58.2% of the population (48 million people based on the 2012 population figure). Beneficiaries include government employees, retirees, newly-born children, students (school-age and university), unemployed women and widows. The scheme includes an outpatient medicines benefit where all medicines, including those for treating NCDs, are provided free-of-charge.

Survey methodology

A total of 63 medicines were surveyed; 27 were from a list used in the NCD surveys in the region (with pre-set strengths, dosage forms and recommended pack sizesⁱⁱⁱ) plus 36 were selected due to national importance (also strength and dosage form specific, and recommended pack sizes). Note: different strengths and dosage forms of the survey medicines, and therapeutic alternatives may be on the market (but were not included in the survey).

Of the 63 medicines, forty-six (46) were on the 2012 Egyptian EML.

Patient prices were recorded for the originator brand product (OB) and most sold generic equivalent (MSG) both of which were identified at the national level; and for the lowest priced generic equivalent (LPG) which was determined at each outlet. Most sold generic products were identified using IMS Health sales volume data for the private sector (so does not apply to the public sector).

Of the 63 survey medicines, 2 were older medicines with no identifiable originator brand, 16 originator brand products were not registered in Egypt at the time of the survey, and 4 medicines had no generics registered.

The 63 medicines were separated into a main list (58) and a list of cancer medicines (5). Patient prices for the 58 main

list medicines were collected from a total of 50 private pharmacies in 7 governorates i.e. Cairo, Giza, Qaliobeya, Alexandria, Dakahleya, Assiut and Ismailia. A total of 10 regions were surveyed: Cairo (2 regions), Giza (2 regions), Qaliobey (2 regions), Alexandria (1 region), Dakahleya (1 region), Assiut (1 region) and Ismailia (1 region).

Public sector procurement prices were obtained from the Ministry of Health central tender (2012/2013), and 3 university hospitals tenders (2012). For the 5 cancer medicines, procurement prices were collected from the Ministry of Health central tender (2010) and 2 university hospitals tenders (2013).

Availability was not measured due to logistical challenges at the time of the survey that would have prevented the collection of sufficient data. Price component data were not collected as a new pricing decree had been issued which includes new mark-up levels. However, these new mark-ups had not been implemented as agreement had not been reached with various pharmaceutical bodies. It was felt that any findings on mark-ups would soon be obsolete so this was not surveyed.

Table 1. Measurements in each sector

| Measurement | Public sector | Private pharmacies | Public/ University hospitals* |
|-------------------|--|--------------------|--|
| Price to patient | zero cost | ✓ | zero cost |
| Affordability | zero cost | ✓ | zero cost |
| Procurement price | ✓ | Not measured | ✓ |
| Data collection | MoH central tender; 3 university hosp. tenders | 50 pharmacies | MoH central tender; 2 university hosp. tenders |

*Cancer medicines only

Presentation of price information

The WHO/HAI survey methodology presents prices in local currency (Egyptian Pound) and as median price ratios (MPR). The MPR is calculated by dividing the local price by an international reference price (converted to Egyptian Pounds). 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 2012 Management Sciences for Health (MSH) International Drug Price Indicator Guide^{iv} (the MSH Guide pulls together information from recent price lists of not-for-profit and for-profit medicine suppliers for multisource medicines and thus reflects the prices governments could be expected to pay when tendering for medicines).

Interpretation of findings

Country specific factors such as pricing policies, market size, competition, national economic and other factors may influence prices. For the purposes of these surveys, in

low- and middle-income countries an MPR of less than or equal to 1 for public sector procurement prices are considered to indicate acceptable prices.

Public sector procurement prices

MOH Central Tender

As shown in Table 2, for the 24 medicines (lowest priced generics) being procured by the Ministry of Health in 2012/13 tenders, the overall price was 0.49 times (51% below) international reference prices. Only one originator brand was procured (hydrocortisone sod. succinate inj). Only three medicines were procured at 50% or more than the international reference price i.e. paracetamol 500mg tabs (122% more), ibuprofen 400mg tab (86% more) and furosemide 40mg tabs (67% more).

The MOH was procuring 6 medicines not on their 2012 EML: atenolol 50mg tab, captopril 25mg tab, carvedilol 25mg, diclofenac 25mg, epoetin alpha 4000IU inj, and losartan 50mg tab. However, atenolol, captopril and diclofenac were on the former EML.

Table 2. Summary of Median Price Ratios (MPR): MOH procurement prices compared to international reference prices

| | Originator brand | Lowest priced generic |
|-------------------------------------|------------------|-----------------------|
| Median MPR (interquartile range) | 0.90 | 0.49 (0.27-0.79) |
| Minimum | | 0.08 |
| Maximum | | 2.22 |
| No. of medicines | 1 | 24 |

University hospital tenders

Across the 3 university hospitals sampled, overall procurement prices were 0.67 and 0.76 times (i.e. 33% and 24% below) international reference prices for originator brands and lowest priced generics respectively.

Table 3. Summary of Median Price Ratios (MPR): University hospital procurement prices compared to international reference prices

| | Originator brand | Lowest priced generic |
|-------------------------------------|---------------------|-----------------------|
| Median MPR (interquartile range) | 0.67 (0.36-2.26) | 0.76 (0.46-1.32) |
| Minimum | 0.33 | 0.12 |
| Maximum | 13.63 | 3.96 |
| No. of medicines | 7 | 39 |

While overall procurement prices were below international reference prices, some individual medicines were more than twice the reference price as shown in Table 4.

Table 4. Median Price Ratios (MPR): University hospital procurement prices for individual medicines compared to international reference prices

| Medicine | Product type | MPR |
|-------------------------|--------------|-------|
| Amlodipine 5mg tab | OB | 13.63 |
| Risperidone 2mg tab | LPG | 3.96 |
| Carbamazepine 200mg tab | OB | 3.34 |
| Amitriptyline 25mg tab | LPG | 2.16 |
| Phenytoin 100mg cap | LPG | 2.05 |

OB= originator brand, LPG=lowest priced generics

Some medicines showed little price variation across the tenders (MOH central tenders and the 3 university hospital tenders). However, there were examples of price variations e.g. carbamazepine 200mg tab ranged from 0.0645 to 0.4092 EGP per tab, and amlodipine 5mg tab ranged from 0.060 to 0.350 EGP each. Even across the university tenders there were a few large price variations e.g. metoclopramide 5mg/ml injection ranged from 0.0375- 0.90 EGP per mL. If all institutions procured at the lowest price significant savings may result.

Cancer medicines

Table 5 shows the procurement price ratios for individual cancer medicines when purchased through the MOH central tender and two university hospital tenders. Procurement prices were below international reference prices except for the originator brand of oxaloplatin. Note: MOH tender prices were for 2010 whereas the university hospital prices were for 2013.

Table 5. Median Price Ratios (MPR): Public sector procurement prices for individual cancer medicines compared to international reference prices

| Medicine | Product type | MOH tender MPR | University hosp. tender MPR |
|-----------------------|--------------|----------------|-----------------------------|
| Carboplatin 450mg inj | LPG | 0.82 | 0.98 |
| Cisplatin 1mg/ml inj | LPG | - | 0.46 |
| Etoposide 20mg/ml inj | LPG | - | 0.83 |
| Imatinib 400mg tab | OB | 0.26 | - |
| Oxaloplatin 100mg inj | OB | - | 2.09 |
| | LPG | 0.44 | 0.99 |

OB= originator brand, LPG=lowest priced generics

Patient prices in private pharmacies

Note: not all Egyptians pay for medicines out-of-pocket from private pharmacies. Approximately 58.2% of the population are covered by the public health insurance scheme where medicines for NCDs are provided free-of-charge.

Across the 50 private pharmacies surveyed, prices were 3.71, 2.22 and 2.22 times the international reference price for originator brand medicines, most sold generics and lowest priced generics respectively (Table 6).

In interpreting this data it must be remembered that international reference prices are bulk procurement prices so in the private sector it would not be expected that patients are paying international reference prices. Manufacturer's selling prices are usually higher for smaller quantities, and distribution chain costs will apply. It is important to consider the affordability of medicines (see below) as that helps determine if patient prices in the private sector are reasonable or not.

Table 6. Summary of Median Price Ratios (MPR): patient prices in the private sector compared to international reference prices

| | Originator brand | Most sold generic | Lowest priced generic |
|----------------------------------|------------------|-------------------|-----------------------|
| Median MPR (interquartile range) | 3.71 (1.20-8.95) | 2.22 (0.93-3.82) | 2.22 (0.89-3.82) |
| Minimum | 0.34 | 0.15 | 0.15 |
| Maximum | 32.90 | 16.45 | 16.45 |
| No. of medicines | 40 | 51 | 51 |

The median price of the 40 originator brands found in the private sector was 3.71 times the international reference price, with some medicines significantly higher at over 10 times the international reference price (acetyl salicylic acid, amlodipine, clopidogrel, fluoxetine, glibenclamide, meloxicam, omeprazole, risperidone, simvastatin). Eight medicines had prices below the international reference price (allopurinol, lactulose syrup, levothyroxine, propranolol, salbutamol inhaler, sodium valproate syrup, isophane and soluble insulin).

Overall, most sold generics and lowest priced generic were 2.22 times the international reference price, with 10 medicines over 5 times the international reference price (acetyl salicylic acid, diazepam, diclofenac, enalapril, furosemide, meloxicam, metoclopramide, omeprazole, risperidone, and simvastatin). Fifteen (15) medicines had prices below the international reference price (allopurinol, beclometasone inhaler, betamethasone valerate cream, clozapine, gliclazide, isophane and soluble insulin, isosorbide dinitrate, lactulose syrup, lisinopril, propranolol, salbutamol inhaler, sodium valproate syrup, tamoxifen, and timolol eye drops).

Table 7 lists those medicines with the highest multiples of international reference prices where there could be opportunities for buying and selling at lower prices.

Table 7. Summary of Median Price Ratios (MPR): patient prices in the private sector compared to international reference prices

| | Originator brand | Lowest priced generic |
|-----------------------------|------------------|-----------------------|
| Simvastatin 20mg | 32.90 | 16.45 |
| Acetyl salicylic acid 100mg | 27.91 | 6.98 |
| Clopidogrel 75mg | 14.43 | 3.94 |
| Fluoxetine 20mg | 19.09 | 3.70 |
| Meloxicam 7.5mg | 15.27 | 5.97 |
| Omeprazole 20mg | 23.13 | 5.78 |
| Risperidone 2mg | 20.04 | 7.11 |
| Diclofenac 25mg | 9.89 | 5.28 |
| Enalapril 5mg | | 6.89 |
| Diazepam 5mg | | 6.91 |
| Furosemide 40mg | 5.95 | 6.54 |

tab/cap unless otherwise stated

Price variation by medicine

There was no variation in price across pharmacies for originator brands, and only six most sold generic products showed some price variation (although it was not great). Some lowest priced generics showed price variation, probably reflecting different products found in the

pharmacies. As shown in Table 8, the greatest variation was seen for lowest priced generics of bisacodyl where the 25th and 75th percentiles ranged from 1.10 to 8.79.

Table 8. Price variation in private pharmacies for some lowest priced generics (patient prices compared to international reference prices)

| Medicine | MPR | 25 th % MPR | 75 th % MPR | Min MPR | Max MPR |
|---------------------|------|------------------------|------------------------|---------|---------|
| Bisacodyl 5mg | 1.10 | 1.10 | 8.79 | 1.10 | 8.79 |
| Clopidogrel 75mg | 3.94 | 3.55 | 3.94 | 0.99 | 3.94 |
| Carbamazepine 200mg | 3.67 | 1.55 | 3.67 | 1.55 | 4.89 |

tab/cap unless otherwise stated

Price variation by product type

Using matched medicines pairs, originator brands were on average 1.8 times (80% more) the price of most sold generics and lowest priced generics (Table 9). Overall, most sold generics were the same price as lowest priced generics.

Table 9. Ratio matched pairs of product types, private pharmacies

| | Ratio |
|---|-------|
| Originator brand: most sold generic (n=36 medicines) | 1.8 |
| Originator brand: lowest priced generic (n=36 medicines) | 1.8 |
| Most sold generic: lowest priced generic (n=51 medicines) | 1.0 |

Comparison of patient prices across survey regions

Across individual medicines in private pharmacies, there was virtually no variation in patient prices across the regions surveyed for any product type. That said, diazepam 5mg varied in price from 0.125 EGP per tab in Assiut and a pharmacy in Cairo, Giza and Dakahleya but was 0.30 EGP in pharmacies in the other regions/pharmacies.

Comparison of patient prices in urban and rural areas

Patient prices showed virtually no variation across pharmacies in urban and rural areas.

Affordability

Affordability is calculated as the number of days the lowest paid unskilled government worker would have to work to pay for 30 days treatment for NCD medicines. On 1 January 2014 the daily wage is increasing to 40 Egyptian Pounds [equivalent to US\$ 5.80 per day] so this figure was used in the analysis^v.

Needing to spend more than 1 day's income per month on family medicine needs could be considered to be unaffordable. Table 10 lists how many days this worker would have to work to purchase various treatments.

Table 10. Affordability: number of days' wages to purchase standard treatment

| Medicine & number of units | Private pharmacies |
|---|-------------------------------|
| Diabetes | |
| Glibenclamide 5mg x60 | 0.5 OB / 0.2 MSG / 0.2 LPG |
| Metformin 500mg x90 | 0.7 OB / 0.5 MSG / 0.5 LPG |
| Gliclazide 80mg x30 | 0.3 OB / 0.2 MSG / 0.2 LPG |
| Isophane insulin 100IU 10ml | 0.8 OB / 0.8 MSG / 0.8 LPG |
| Regular insulin 100IU 10ml | 0.8 OB / 0.8 MSG / 0.8 LPG |
| Cardiovascular disease | |
| Amlodipine 5mgx30 | 1.7 OB / 0.6 MSG / 0.6 LPG |
| Atenolol 50mgx30 | 0.4 OB / 0.1 MSG / 0.1 LPG |
| Captopril 25mgx60 | 0.8 OB / 0.5 MSG / 0.5 LPG |
| Carvedilol 25mg x30 | 2.1 OB / 0.9 MSG / 0.9 LPG |
| Digoxin 0.25mg x30 | 0.1 OB / 0.1 MSG / 0.1 LPG |
| Enalapril 5mgx60 | 0.4 MSG / 0.4 LPG |
| Lisinopril 10mg x30 | 1.1 OB / 0.6 MSG / 0.6 LPG |
| Losartan 50mgx30 | 2.8 OB / 1.4 MSG / 1.4 LPG |
| Nifedipine 20mg Retard x60 | 0.4 MSG / 0.4 LPG |
| Atorvastatin 10mg x30 | 3.2 OB / 1.7 MSG / 1.7 LPG |
| Simvastatin 20mg x30 | 4.3 OB / 2.1 MSG / 2.1 LPG |
| Acetyl salicylic acid 100mg x30 | 0.4 OB / 0.1 MSG / 0.1 LPG |
| Clopidogrel 75mg x30 | 5.5 OB / 1.5 MSG / 1.5 LPG |
| Enoxaparin 40mg syringe x7 | 5.3 OB |
| Respiratory disease | |
| Beclometasone 50mcg/dose x1 inhaler (200 doses) | 0.5 MSG / 0.3 LPG |
| Salbutamol 100mcg/dose x1 inhaler (200 doses) | 0.3 OB / 0.3 MSG / 0.3 LPG |
| Mental health /neuroleptic disorders | |
| Amitriptyline 25mg x90 | 0.3 MSG / 0.3 LPG |
| Fluoxetine 20mg x30 | 3.5 OB / 0.7 MSG / 0.7 LPG |
| Carbamazepine 200mg x90 | 1.2 OB / 1.0 MSG / 1.0 LPG |
| Phenytoin 100mg x90 | 0.5 MSG / 0.5 LPG |
| Clozapine 25mg x90 | 1.8 OB / 1.2 MSG / 1.2 LPG |
| Risperidone 2mgx90 | 14.0 OB / 5.0 MSG / 5.0 LPG |
| Other NCDs | |
| Diclofenac 25mg x60 | 0.6 OB / 0.3 MSG / 0.3 LPG |
| Epoetin alpha 4000IU inj x12 | 57.0 OB / 34.5 MSG / 34.5 LPG |
| Ibuprofen 400mg x90 | 4.1 OB / 3.2 MSG / 3.2 LPG |
| Levodopa+carbidopa 250/25mg x90 | 4.5 OB / 2.7 MSG / 2.7 LPG |
| Levothyroxine 50mcg x30 | 0.1 OB |
| Omeprazole 20mg x30 | 2.9 OB / 1.2 MSG / 0.7 LPG |
| Tamoxifen 20mg x30 | 0.7 MSG / 0.7 LPG |

OB – originator brand; MSG – most sold generic; LPG – lowest priced generic. tab/cap unless otherwise stated

When using generics, most standard treatments required less than 1 days' wages when purchasing 30 days treatment.

Neuroleptics (clozapine and risperidone) were less affordable at 1.2 to 14 days' wages depending on the medicine and product type purchased. Likewise, taking levodopa/carbidopa for Parkinsons Disease, ibuprofen for arthritis, and epoetin alpha injections for anaemia will be unaffordable for those on low wages, even when using lowest priced generics (requiring 2.7, 3.2 and 34.5 days' wages respectively). Enoxaparin injections, used to prevent blood clots, would also be unaffordable requiring about 5 days' wages each month for treatment.

Should this government worker need oral treatment for hypertension, diabetes and hypercholesterolaemia, then they would have to use 2 to 7.8 days wages every month to purchase medicines, depending upon the choice of medicine and product type^{vi}. This scenario only represents the medicine needs for one person in a family and hence the burden would be much greater if other family members need medicines.

Summary of key findings from this survey

- Overall public sector procurement prices were good, however, some individual medicines were procured at high prices. Some medicines not on the 2012 EML were being procured. For cancer medicines, public procurement prices were reasonable.
- Overall patient prices in private pharmacies were reasonable when compared with international reference prices. However, some individual medicines were very high priced as originator brands and, in some cases, also lowest priced generics. On average originator brands were 80% higher priced than most sold and lowest priced generics. There was little price variation across pharmacies, regions, and between pharmacies in urban and rural regions.
- Many standard treatments using lowest priced generics required less than 1 days' wages when purchasing 30 days' supply, except for some medicines to treat neuroleptic disorders, Parkinsons Disease and anaemia which are unaffordable for those on low wages. Treating co-morbidities, such as diabetes, hypertension and hypercholesterolaemia, would be largely unaffordable.

Recommendations

Based on the findings of this survey, the MOH recommends the following actions in priority order and showing general timelines:

In progress:

- Implement new legislation and apply new social health insurance coverage to alleviate any medicine affordability problems (longer-term).
- Update the EML (short-term) and review it regularly.

Planned:

1. Utilize pharmaco-economic analyses as a tool for tendering therapeutically equivalent medicines, and pricing of new medicines (short-term).

2. Consider joint tenders for public sector medicine procurement which could result in significant savings. A starting point may be a central university tender (short-term).
3. Regularly monitor procurement prices internationally (including MSH's International Drug Price Indicator Guide) and develop a network amongst countries to share prices in order to make better informed procurement decisions, to self-audit, and to enhance bargaining powers especially for single-source NCD medicines (short-term).
4. Improve the public sector pharmaceutical supply chain, including forecasting. Greater volumes (where needed) should result in lower central tender prices (longer-term).
5. Survey the availability of NCD medicines in public sector outlets and in the private sector (short-term)
6. Request WHO EMRO to establish a regional medicine procurement price exchange, as has been established in WHO's Western Pacific Region (short-term).
7. Ensure all generics on the market are quality-assured and educate the public and health professionals to improve acceptance and use of lower-priced generics (longer-term).
8. Regularly monitor medicine prices and affordability in the private sector to ensure policy changes result in improved affordability. This may include surveying prices and affordability of locally manufactured vs imported medicines when WHO publishes the methodology in 2014 (longer-term).
9. Improve transparency by publishing government procurement prices on the MOH's website (short-term).

Further information

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All the data can be found at

<http://www.haiweb.org/MedPriceDatabase/>

ⁱ WHO/HAI Measuring medicine prices, availability, affordability and price components, 2008; <http://haiweb.org/medicineprices/>

ⁱⁱ Demographic, Social and Health Indicators for Countries of the Eastern Mediterranean, 2013 WHOEM/HST/213/E; Egypt Pharmaceutical Country Profile 2011.

ⁱⁱⁱ Reflecting the burden of NCD disease and WHO's focus on cardiovascular disease, diabetes, respiratory disease and cancer in its NCD Global Plan of Action.

^{iv} <http://erc.msh.org>

^v 1 USD = 6.8913 Egyptian Pounds (Central Bank of Egypt)

^{vi} One antihypertensive (atenolol, amlodipine, captopril, carvedilol, enalapril, losartan, lisinopril, nifedipine) one anti-diabetic (glibenclamide, gliclazide or metformin) and one antihypercholesterolaemia (simvastatin or atorvastatin)