Yemen

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 countries where patients often have to pay the full price of medicines. This brief report about medicine prices and availability in Yemen is one of a series of papers summarizing the results of national medicine price and availability surveys carried out around the globe using a standard survey methodology developed by the World Health Organization (WHO) and Health Action International (HAI). It uses a group of 30 medicines, with pre-set dosage forms, strengths, and pack sizes that are relevant to the global burden of disease, plus selected medicines of national importance. The Yemen survey was undertaken in mid-2006 by the Supreme Board for Drugs and Medical Appliances (drug regulatory authority).

Within Yemen:

- The availability of medicines in the public sector outlets was very low.
- In private pharmacies, the prices of originator brand products were generally very high whereas prices of generic equivalents varied from very cheap to high.
- Treatments with low priced generics were relatively affordable compared to originator brands.

Generally, across the WHO Eastern Mediterranean Region, a similar picture emerges: reasonably efficient public sector procurement, people having to pay for their own medicines in the private sector, often at high and frequently unaffordable prices; and the need for stronger government action to introduce or improve national medicines policies and effective pricing policies.

Yemen medicine price and availability survey

Yemen has a population of approx. 19.7 million inhabitants, 71% of whom live in rural areas. The illiteracy rate is high and reaches about 55.7%. Yemen is a low-income country with per capita gross domestic product (GDP) of US$ 659. Yemen spent 5.5% of its GDP on health in 2003 with a total health expenditure per capita of US$ 32. Private expenditure on health as a percentage of total expenditure on health was estimated to be 59% in 2003. In general health services (either public or private) are mainly found in major cities, although primary health care centres/units and polyclinics are scattered throughout the whole country, including some rural areas. Public health services are not free; the patient pays a prescription fee and the ex-store cost of medicines with a 10% mark-up (except for certain subsidized medicines which are given for free) and the cost of any diagnostic tests, as needed. The local pharmaceutical industry covers approximately 10% of the total pharmaceutical market; most medicines are imported via private sector agents. A total of 35 essential medicines were sampled: 27 from the WHO/HAI core list and 8 supplementary medicines. A total of 20 public sector outlets and 20 private pharmacies were included in the survey in the capital Sana'a and the main cities of three other populated governorates: Aden, Taiz and Hodeidah. In each city, one principal public general hospital, four public health centres and five private pharmacies were sampled (see Table 1). The procurement prices were obtained from the National Program for Medical Supply.

Table 1. Measurements in each sector

Areas measured in each sector	Public sector	Private sector
Affordability to patients	√	√
Procurement price	√	–
Price to patients	√	√
Availability	√	√
No. of facilities visited	4 hospitals, 16 public sector outlets	20 private retail pharmacies

Presentation of price information

The WHO/HAI survey methodology presents prices as median price ratios (MPR). The MPR is calculated by dividing the local price by the international reference price (converted into 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

[1] WHO/HAI. Medicine prices: a new approach to measurement, Geneva, World Health Organization, 2003. 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 World Health Organization Eastern Mediterranean Region*. Cairo, World Health Organization Regional Office for the Eastern Mediterranean, 2008 (in press).

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survey were taken from the 2005 Management Sciences for Health (MSH) International Drug Price Indicator Guide (median prices of high quality multi-source medicines offered to developing countries by different suppliers). Use of reference prices facilitates international comparisons.

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 a low-income developing 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 a treatment course for an acute condition or one month's treatment for a chronic condition. At the time of the survey, the lowest paid Yemeni government worker earned 555 Yemeni riyals (YER) (US$ 2.81) per day. Owing to the limited availability of the medicines surveyed, it was possible to calculate affordability in the public sector for only three conditions, with all three medicines costing less than half a day's wage.

Overall in the private retail pharmacies a Yemeni worker, if purchasing lowest priced generics, would generally need less than one day's wage for the standard treatments analysed for affordability, except for amitriptyline (depression), captopril (hypertension), metformin (diabetes) and carbamazepine (epilepsy) where 1.8, 1.4, 1.4 and 1.1 days' wages are required, respectively (Figure 1).

The cost of standard treatments with originator brands were 2 to 12 times greater than the cost when using lowest priced generic equivalents. Treatments with originator brands therefore generally cost more than 3 days' wages. The most expensive treatments when using originator brands included the treatment of peptic ulcer with ranitidine, 5.8 days' wages; treatment of hypertension with captopril, 5.4 day's wages; and treatment of arthritis with diclofenac, 5 days' wages.

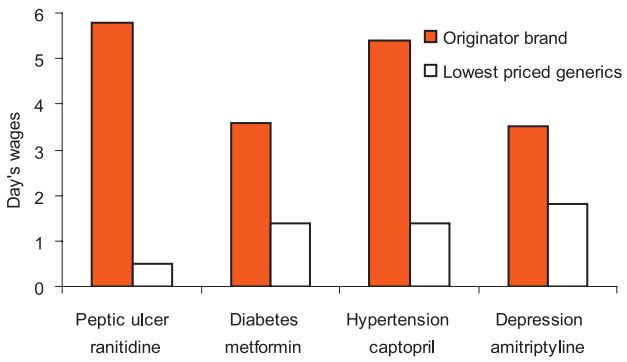

Figure 1. Affordability: number of days' wages for one month's treatment

Public sector prices

The data on public sector procurement prices were limited as tender price information was available for only six medicines (all generics). Due to the low availability of medicines in the public sector, there was little data for calculating price ratios for prices that patients pay in public sector health facilities. On average, generic medicines were purchased by the National Program for Medical Supply at 20% lower price (median MPR = 0.79) than international reference prices (Table 2). This suggests that the National Program for Medical Supply is efficient when procuring medicines, although it is difficult to judge the efficiency of public procurement of pharmaceuticals in Yemen based on such limited data. Likewise, patient prices in the public sector were generally acceptable (median MPR 1.09 for lowest priced generics). However, owing to poor medicine availability, data for only six medicines could be included in the analysis (Table 2) and it was not possible to assess the difference between public sector procurement prices and patient prices (i.e. public sector mark-up).

Public sector availability

The results showed overall public sector median availability of only 5% (Table 3). Only 6 of the 35 surveyed medicines were found in at least four of the surveyed outlets. For individual medicines, a complete absence of more than 45% of the targeted medicines was observed (16 out of 35) which are used to treat important diseases such as hypertension, epilepsy (phenytoin), diabetes (metformin), thyroid disorders (levothyroxine) and asthma (salbutamol and beclometasone inhalers). Only two medicines were in stock in at least 30% of the public health facilities surveyed: captopril (30% availability) and chloroquine phosphate (70% availability). Clearly, most patients have to purchase medicines from private retail pharmacies.

Table 2. Number of times more expensive: public sector prices of lowest priced generics compared to internatinal reference prices

	Procurement prices	Patient prices
Median MPR *(interquartile range)*	0.79 *(0.7–1.2)*	1.09 *(0.9–1.5)*
Minimum	0.5	0.6
Maximum	2.5	2.3
No. of medicines	6	6

Table 3. Availability of survey medicines (*n* = 35) in private retail pharmacies

	Originator brand	Lowest priced generic
Median availability *(interquartile range)*	0%	5% *(0–12.5%)*

Private sector prices

The median retail price of originator brands in the private sector in Yemen was about 18 times higher than international reference prices (Table 4). The prices of these originator brands varied between 2 and 130 times more, with 75% of them costing at least 7 times more than the international reference price. For lowest price generic equivalents, MPRs varied from 0.3 to 18 times greater than international reference prices. The median MPR was 3.5.

At the individual medicines level, the results show that:

- MPRs of some lowest priced generics were much less than the reference prices, such as risperidone (0.26). This may be attributed to registered cheaper sources from south and south-east Asia, such as India, Pakistan.
- The differences between prices of originator brands and their lowest priced generic equivalents were often very high. For instance, originator brand ciprofloxacin was 24 times higher priced than the lowest priced generic equivalent. Originator brands of fluconazole, omeprazole and ranitidine were a little over 11 times more than their lowest priced generic equivalents.

In some cases, both the originator brand and the lowest priced generic equivalent were excessively expensive. Figure 2 illustrates examples of high priced medicines (both originator brands and lowest priced generics) with MPRs over 5.

Across the private pharmacies, there were considerable price variations for some lowest priced generic medicines and originator brand products. As shown in Figure 3, the interquartile range for originator brand glibenclamide was 20.77 (25th percentile) – 56.24 (75th percentile), with the median MPR of 51.92. For originator brand diclofenac there was less variability; the interquartile range was 43.4 – 52.08 (median MPR 44.62).

Table 4. Number of times more expensive: patient prices in private retail pharmacies compared to international reference prices

	Originator brand	Lowest priced generic
Median MPR *(interquartile range)*	18.11 *(7.4–35.6)*	3.5 *(1.9–7.4)*
Minimum	2	0.3
Maximum	129.4	18.1
No. of medicines	26	30

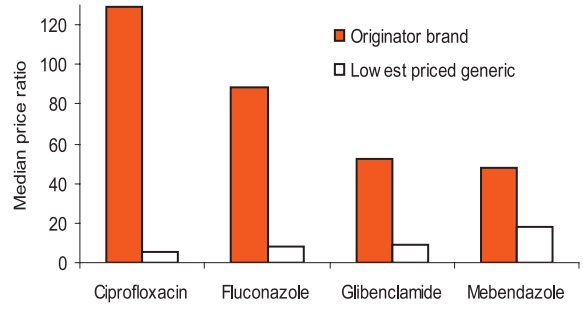

Figure 2. Examples of high prices in private pharmacies

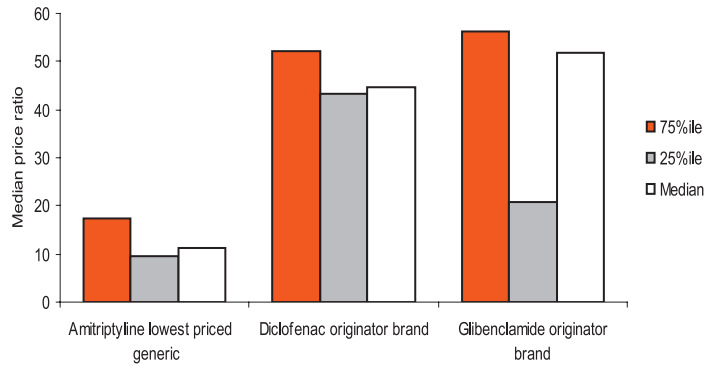

Figure 3. Examples of price variations across private retail pharmacies

Brand premiums in the private sector

For the 24 medicines available in private pharmacies as both the originator brand and lowest priced generic equivalent, the variation in price (median brand premium) was 26%, i.e. on average the cost of the lowest priced generic equivalent was a quarter of that of the originator brand product. The interquartile range was 15% –38%.

Although the various sources of medicines (domestic, Arab countries, south-east Asian countries and European producers) may explain the large price variations of lowest priced or branded generics, it is very difficult to give a feasible explanation or interpretation for originator brand products unless some of the significantly lower cost originator brand products were imported from a subsidized factory in countries with very cheap labour.

Private sector availability

The median availability of the surveyed medicines was very high for generics, 90%, in private retail pharmacies. The median availability for originator brands was 50% (Table 5).

Table 5. Availability of survey medicines (*n=35*) in private retail pharmacies

	Originator brand	Lowest priced generic
Median availability *(interquartile range)*	50% (17.5%–90%	90% *(70%–97.5%)*

No products, either originator brands or generics, were found in the private retail pharmacies surveyed for three medicines: nevirapine, lovastatin and hydrochlorothiazide.

Intersectoral comparisons

The overall price people pay for lowest priced generics in the private sector was twice the patient price in the public sector, and ten times the government procurement price. However, low public sector availability makes it difficult to make sound cross-sector conclusions except the possibility that ceftriaxone injection had been purchased from the local private market which would account for the similarity in price across the sectors (private/public ratio 1.18). This contrasts with a 16-fold difference in the price of generic ranitidine.

Price components

The official cumulative mark-up in the private sector supply chain is 57.44%, whether the medicine is imported or locally produced, generic or originator brand. This includes a wholesale mark-up of 10% and a pharmacy mark-up of 20%. This represents 37% of the total patient price in the case of generic aciclovir, with the manufacturer's price contributing 63% of the final patient price (Figure 4).

Note: Price component data were obtained from official sources and not validated in the field.

To see if the official cumulative mark-up of 57.44% is applied, patient prices of originator brands in the private sector were compared to registered CIF prices. If an offset of ±10% of the official cumulative mark-up is applied, only 8 of 26 originator brand products belong to this category. Table 6 shows some of the wide variations in mark-ups, based on the difference of registered CIF price and observed patient price.

There might be several reasons for such wide variability in cumulative mark-ups:

- officially set retail margins are violated by wholesalers and/or retailers to increase profits;
- registered CIF prices are incorrect or manipulated to decrease liabilities (the 1% importation fee for the cost of each pro-forma invoice and the 5% customs fee for the cost of each shipment);
- the official margin of 57.44% is not feasible and considered to be unfair by medicines traders.

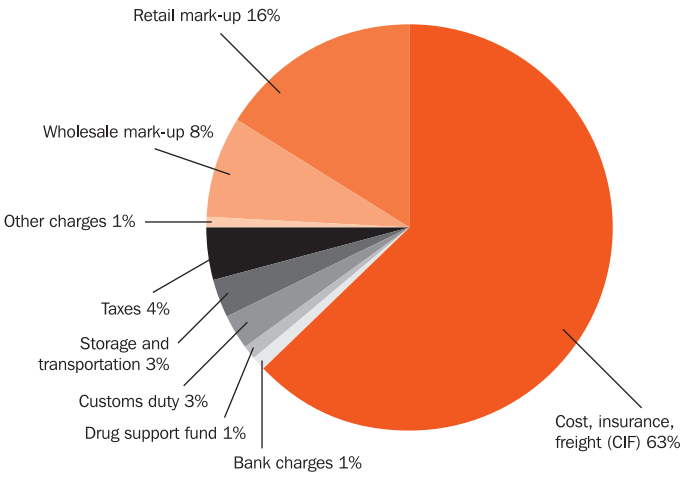

Figure 4. Price composition of the patient price of aciclovir (lowest priced generic) in the private sector

Table 6. Cumulative mark-ups observed for originator brands in the private sector

Medicine	Cumulative mark-up	Country of origin
Amitriptylne	128.5%	Netherlands
Carbamazepine	−13.8%	Switzerland
Ciprofloxacin	719.3%	Germany
Glibenclamide	393.8%	Egypt
Lisinopril	−28.3%	United Kingdom

Conclusions

- Because of the limited public procurement data and very low availability of most medicines in public health facilities it is difficult to make a sound judgement about public health sector prices, that is not also misleading. However, public procurement appeared to be efficient for the few surveyed medicines being procured, and prices paid by patients in the public sector were close to procurement prices.
- Overall the availability of generics in private retail pharmacies was excellent. Originator brand products were also widely available for most of the surveyed medicines. However, the 100% availability of some third generation antibiotics, such as ceftriaxone injection which is mainly used to treat meningitis, pneumonia and septicaemia, may indicate the abuse of the newer generations of antibiotics.
- In comparison with international reference prices, the prices of lowest priced branded-generic/generic medicines in the private sector varied from very cheap to considerably high priced. Most originator brands were considerably higher priced than the reference prices (75% had an MPR>7).

- Almost half of the prices of 15 originator brands were higher in Yemen compared to three Arab countries with much higher GDP per capita, namely, Jordan, Lebanon and Kuwait.
- In comparison with the registered CIF prices of medicines, the cumulative mark-ups varied widely. Some were less than the officially allowed mark-up (57.44%) or even negative (providing evidence of exaggeration in the registered CIF prices) while others reflect significantly greater mark-up values, showing violation of Yemeni pricing policy.

Recommendations

Based on the findings of the study, recommendations made by the investigators to the Government of Yemen included the following.

1. Enhance the role of the public sector to ensure the availability of all medicines on the national essential list, after revising and updating the list to accommodate new therapeutic categories and emerging illnesses.

2. Find alternative sources of financing for the purchasing of medicines and implementing suitable mechanisms to rationalize expenditure; the National Health Accounts methodology might be useful in this regard.

3. Adopt a pricing system that takes into consideration:

- whether medicines are locally produced or imported; originator brands or generics/branded-generics; life saving or otherwise;
- comparing prices across a well-chosen range of countries which use cost-effectiveness analysis, taking into account differences in their wealth to that of Yemen;
- applying regressive mark-ups that is, setting lower mark-ups for more expensive medicines;
- the price of therapeutically equivalent products with the same risk–benefit trade-offs;
- using the registration of new medicines to reduce the prices of older brands produced by the same pharmaceutical company;
- comparing prices compiled by non-profit organizations/ institutions such as Management Sciences for Health, Australian Pharmaceuticals Benefit Scheme and other sources;
- extensive use of pharmaco-economic tools and measurements, including cost–benefit analysis, cost–effectiveness analysis, cost–minimization analysis and cost–utility analysis.
- socioeconomic situation analysis of the country as well as the affordability of treatments for poor patients.

4. Check and revise registered CIF prices on a fair, reliable and regular basis, given that prices of raw materials are decreasing annually for originator brands with the introduction of numerous generic/ branded-generic equivalents.

5. Encourage the prescribing of medicines by the generic name; information disseminated in the media and through health syndicates/ professional associations could play an important role in achieving this goal.

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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