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 price data drawn from, and published in, leading pharmaceutical journals, 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). Further information

Table 1. Measurements in each sector

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<th>Sector</th>
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2 WHO/HAI.


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Public sector prices

The median price of originator brands was relatively low in Yemen. Due to the low availability of medicines in the public sector, there were few data for calculating price ratios for these products. The median price of originator brands was approximately 3.5 times higher than the international reference price (Table 2). This suggests that the prices of originator brands are generally acceptable in the public sector, even when compared to international reference prices, such as risperidone (0.26). This may be attributable to registered cheaper sources from south and southeast Asia, such as India, Pakistan.

• The difference between price of originator brands and their generic equivalents was often very high. For instance, originator brand ciprofloxacin was 24 times higher than the international reference price. The highest price ratios were for originator brands of Baclofen, oxandrolone, and cefazolin and carbenicillin, which were a few times lower than the 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 prices for originator brands of some surveyed medicines. Across the private pharmacies, there were considerable price variations for some lowest-priced generics and originator brand products. As shown in Figure 3, the interquartile range for originator brand products (50%–75% percentile) was 15%–26% (median MPR 44.62). For originator brand diclofenac, there was less variability; the interquartile range was 4.4%–12.0% (median MPR 1.09 for lowest priced product). For originator brand glibenclamide was 20.77 (25th percentile)–52.08 (median MPR 44.62).

Price components

The overall price people pay for the lowest priced generic in the private sector was twice the patient price in the public sector, and ten times the government procurement price. However, because public sector prices make it difficult to make sound sector comparisons, except the possibility that health-care facilities in Yemen have purchased foreign products, which would account for the similarity in price to the highest (private/public) patient price. This would create a problem of patient affordability with a 44.6% difference in the price of generic antiretrovirals.

Conclusions

• Because of the limited public procurement data and very few available data on medicine use in public health facilities, it is difficult to make a sound judgment about public health sector prices, that is, those not being marketed. However, public procurement appears to be efficient for the five surveyed medicines, as they are significantly lower cost originator brand products than the international reference prices.

• Overall availability of generics in the private sector

In Yemen, all patients, except those with government health insurance, can purchase originator brand products at their full cost; however, only 8 of 26 originator brand products belong to this category. Table 6 illustrates examples of price variations for some lowest-priced generics and originator brand products. The interquartile range is 3.0%–30%. Although the reasons for this wide variation for originator brand products are difficult to determine, the variation is significant for many patients. The overall price people pay for lowest priced generics in the private sector was 25%–37% higher than the government procurement price.

• Comparing prices for the same medicine in originator and generic forms

The overall price people pay for originator brand products in the private sector was 25%–37% higher than the government procurement price. This represents 35% of the total patient price in the case of generic antiretrovirals, with the manufacturer’s price contributing 63% of the final patient price.

• Immunization

The median availability of the targeted medicines was observed (16 out of 35) which are designated as priority medicines by public health authorities. The median availability of the targeted medicines was observed in public and private sector, respectively.

• Impact of generic price on public health

In the private sector, there was little data for calculating public sector prices, although it is difficult to judge the efficiency of public procurement from the data collected. Including generic prices in public sector procurement data will provide more reliable interpretation for originator brand products unless some of the low-priced generics were imported in the private sector.
Public sector prices

The median price of originator brands in the private sector, on the other hand, was 18 times higher than the reference price. Due to the low availability of medicines in the public sector, there were few data for calculating price ratios. In any event, this was 44% above the international reference price (Table 2). This suggests that the focus on drug purchasing and supply management policies, including the target to double the proportion of private medicines procured through publicsector contracts, should be explicitly included in the policy objectives for the health ministry. Lack of availability of some medicines gave rise to an average of 12% less than the reference price, such as omeprazole (0.26). This may be attributed to registration of the drugs from south and south-east Asia, such as India, Pakistan.

Public sector availability

Table 4 shows availability of survey medicines in the private retail pharmacies. Although availability of survey medicines varied considerably across pharmacies, it was generally good. However, the availability of some medicines in the private sector was very low, leading to a significant reduction in the availability of the lowest-priced generics. In the case of some medicines, the availability of the lowest-priced generic equivalent was extremely low. For example, the availability of the lowest-priced generic equivalent of fluconazole, omeprazole and ranitidine was very low, and was less than 1%. Medicines with low availability in the private sector were mainly those that are in short supply, such as antibiotics, antifungals and antihypertensives. This highlights the need for better procurement and supply management policies to ensure the availability of medicines in the private sector.

Private sector prices

Table 3 shows the median availability of survey medicines in the private sector. The availability of survey medicines in the private sector was generally good, with more than 97.5% of the medicines being available in the private sector. However, the availability of some medicines in the private sector was very low, leading to a significant reduction in the availability of the lowest-priced generics. In the case of some medicines, the availability of the lowest-priced generic equivalent was extremely low. For example, the availability of the lowest-priced generic equivalent of fluconazole, omeprazole and ranitidine was very low, and was less than 1%. Medicines with low availability in the private sector were mainly those that are in short supply, such as antibiotics, antifungals and antihypertensives. This highlights the need for better procurement and supply management policies to ensure the availability of medicines in the private sector.

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Private sector prices

The median price of originator brands in the private sector was 18.1 times higher than the international reference price. Due to the low availability of medicines in the public sector, there were few data for calculating price ratios. In any event, this was 44% above the international reference price (Table 2). This suggests that the focus on drug purchasing and supply management policies, including the target to double the proportion of private medicines procured through publicsector contracts, should be explicitly included in the policy objectives for the health ministry. Lack of availability of some medicines gave rise to an average of 12% less than the reference price, such as omeprazole (0.26). This may be attributed to registration of the drugs from south and south-east Asia, such as India, Pakistan.

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**Public sector prices**

Public sector procurement prices were limited as tender price information was available for only six medicines in the private sector. Due to the low availability of medicines in the public sector, there was little data for calculating price ratios, or prices that patients pay in public sector health facilities. On average, generic medicines were purchased by the National Programme for Drug Supplies at 26% (interquartile range 17–41)% of the official cumulative mark-up (ICM) (Table 2). This suggests that the National Programme for Drug Supplies is not compliant with the NDC, and that generic medicines are generally overpriced, making it difficult to judge the efficiency of tendering procedures in the public sector. As patients spend a significant proportion of their income on medicines, little is known about the difference between public sector procurement prices and public sector patient prices.

**Public sector availability**

In the public sector, 5 of 35 survey medicines were median availability of only 5% (Table 3). Only 1 of the 5 medicines was more than 50% available. As the level of national economic and other factors, may influence procurement prices and public sector patient prices is considerable, it was possible to calculate affordability in the public sector for only three conditions, with all three medicines having a median availability of only 5% (Table 3). Only 1 of the 5 medicines was more than 50% available. For individual medicines, a complete absence of more than 45% of the required medicines was not uncommon, and 15% of the medicines had limited availability. Pain medicines such as paracetamol (acetaminophen), aspirin, naproxen and ibuprofen (ibuprofen) were always available (63%–100% availability), whereas analgesics (flurbiprofen and ibuprofen) and antihypertensives (metoprolol tartrate) were not. Only two medicines were in stock at less than 30% of the public sector’s available stock; naproxen (30% availability) and ibuprofen (52% availability). Clearly, most patients have to purchase medicines from private retail pharmacies.

**Private sector prices**

The median retail price of originator brands in the private sector varied from very cheap to considerably high (Table 4). In some cases, both the originator brand and the lowest priced generic equivalent were excessively expensive. For example, the median prices for the antihypertensive treatments with originator brands were over 100% higher than the cost of the same treatment with low priced generic medicines.

**Private sector availability**

The median availability of the surveyed medicines was very high for the private sector (Table 5). The overall availability of lowest priced generics was very high, 90%, to private retail pharmacies. The median availability for originator brands was 70% (Table 5).

**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 two times the government procurement price. However, low public sector availability makes it difficult to make sound intersector comparisons except that the possibility that infections occur if lower quality medicines are purchased (Figure 2). The price of the same medicine in the public sector is generally lower, which is why the public sector should be the preferred source for low income populations.

**Price components**

The median retail price paid by patients in the private sector supply chain was 57.4%, whereas the medicine is imported to locally produced, although the cost of the patent medicine is only around 10% of the final patient price. It is difficult to assess the difference between public sector procurement prices and public sector patient prices.

**Affordability**

Affordability is calculated as the number of days’ wages that the lowest priced government worker would have to work to meet a treatment cost for an acute condition or one month treatment for a chronic condition. At the time of the study, the Yemeni government worker earned 555 Yemeni riyals (YER) (US$1.11) per day. Tables 6 and 7 show the median affordable wages for a month of treatment for chronic conditions and one month treatment for acute conditions, respectively. Tables 8 and 9 show the interquartile range of each medicine available in each country.

**Conclusion**

The overall lack of access to medicines results from high prices of the same medicine. In the private sector, the public sector availability makes it difficult to make sound comparisons except the possibility that infections occur if lower quality medicines are purchased (Figure 2). The price of the same medicine in the public sector is generally lower, which is why the public sector should be the preferred source for low income populations. Several possible solutions are proposed to improve affordability in the public sector to make medicines available for all. Proposals include reducing the price of medicines, increasing the supply of medicines, and increasing the number of days’ wages that the lowest paid government worker would have to work to meet treatment cost.
Medicine prices and access to medicines in the Eastern Mediterranean Region

3. Adopt a pricing system that takes into consideration:

- expenditure; the National Health Accounts methodology might be applied regressive mark-ups that is, setting lower mark-ups for more expensive medicines;
- comparing prices across a well-chosen range of countries and regions, while others reflect significantly greater mark-up (providing evidence of exaggeration in the registered CIF prices)
- socioeconomic situation analysis of the country as well as an extensive use of pharmaco-economic tools and evidence from the pharmaceutical market; most medicines are imported via private pharmacies.

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 essential 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 essential medicines and implementing suitable mechanisms to rationalize the affordability of treatments for poor patients.

3. Encourage the prescribing of medicines by the generic name, which use cost-effectiveness analysis, taking into account the diagnostic, therapeutic, and preventive indications of medicines.

4. Ensure the pricing of medicines is consistent with the unit cost of production and importation of medicines.

5. Encourage the prescribing of medicines by the generic name; information disseminated in the media and through healthcare professionals/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

Yemen medicine price and availability survey

Yemen has a population of about 23.7 million inhabitants, 75% of whom live in rural areas. The literacy rate is high and market share is about 35.5%. Yemen is a lower-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$ 52. Private expenditure on health as a percentage of total expenditure on health was estimated to be 19% in 2003. In general, health services (either public or private) are mainly found in major cities, although primary health care facilities and hospitals are scattered throughout the whole country, including some rural areas. Public health services are free and the patient pays a prescription fee and the co-payment cost of medicines. In general, a prescription fee is charged for each individual medicine, and is fixed for the cost of one diagnostic test at a hospital. The local pharmaceutical industry covers approximately 30% of the local pharmaceutical market, whereas medicine is imported from the WHO/UNICEF contract and 8 supplementary medicines. A total of 26 public sector outlets and 27 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

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<th>Area measured</th>
<th>Public</th>
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World Health Organization Eastern Mediterranean Region

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Presentation of price information

The WHO/HAI survey methodology provides an average price as median price, range (min–max). The median is calculated by adding the price by the international reference price (corrected to local currency). An MPR of 1 means the local price is equivalent to the reference prices, whereas an MPR of 2 means the local price is twice the reference price. The international reference prices used for the
3. Adopt a pricing system that takes into consideration:

- medicines and implementing suitable mechanisms to rationalize the affordability of treatments for poor patients.  

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

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

Further information

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**Yemen**

The availability of medicines in the public sector cannot be guaranteed fully.  

- In the public sector, the prices of originator brand products are generally very high relative to generic prices.
- Treatments with low priced generics were relatively affordable compared to originator brand.

Generally, across the WHO Eastern Mediterranean Region, a single picture emerges: provisionally effective public sector procurement, public funding to pay for their own medicines in the public sector, often at high and frequently unaffordable prices, and the need for stronger government action to introduce or improve national medicines policies that include pricing policies.

**Yemen medicine price and availability survey**  
Yemen has a population of approx. 26.1 million inhabitants, 71% of whom live in rural areas. The literacy rate is high and market share about 55.7%. Yemen is a low-income country with per capita gross domestic product (GDP) of US$ 571. Yemen spent 5.5% of its GDP on health in 2003 with a total health expenditure per capita of US$ 52. Private expenditure on health as a proportion of total expenditure on health was estimated to be 15% in 2003.  

In general, Yemen’s health services either public or private are mainly funded in major cities, although primary health care centers and public health services are scattered throughout the whole country, including some rural areas. Public health services are free, while the patient pays a prescription fee and the user pays out of pocket or with 10% of his/her income. The same service is provided to everyone. In general, the prices of some medical products are relatively low, whereas some private hospitals and pharmacies charge relatively high prices. 

Within Yemen:

- The availability of medicines in the public sector is not guaranteed fully.  
- In the public sector, the prices of originator brand products are generally very high relative to generic prices.
- Treatments with low priced generics were relatively affordable compared to originator brand.

Generally, across the WHO Eastern Mediterranean Region, a single picture emerges: provisionally effective public sector procurement, public funding to pay for their own medicines in the public sector, often at high and frequently unaffordable prices, and the need for stronger government action to introduce or improve national medicines policies that include pricing policies. 

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