10

International comparisons

While median medicine price ratios within a country can provide insight into the local medicine pricing policies, comparison with medicine prices in other countries can give further information and is particularly powerful in advocacy messages. Reliable evidence that the governments and/or populations of two similar countries are paying very different prices for the same medicine gives advocates and policy-makers in the higher-price country a chance to examine the underlying reasons and to identify ways of obtaining lower prices. Chapter 10 offers suggestions on how international price differences can give clues to possible lines of action to reduce medicine prices.

International comparisons must be undertaken carefully so that valid similarities and differences between like products in like sectors can be identified. The data that you and others using this manual have collected enable international comparisons to be made of:

- the availability and prices of individual originator brand or generic medicines from each defined sector on the global and regional core lists;

- the brand premium – the difference in price between purchasing an originator brand compared to the lowest-priced generic equivalent of the same active ingredient and strength;

- the affordability of selected courses of treatment, measured against each country's public-sector minimum wage; and

- the way in which the retail price of a medicine is composed in different countries.

10.1   PITFALLS IN INTERNATIONAL COMPARISONS

While it is possible to simply take the prices or median price ratio (MPR) for a medicine in two (or more) countries and compare them, the interpretation can be difficult. The medicine market volumes may differ; the surveys may have been conducted in different years with the countries subject to diverse inflation rates (and having used MSH reference prices from different years); and the retail buying power of a currency may vary, depending on the wealth of the respective countries. Adjustment of the data for inflation and purchasing power parity (PPP) may be necessary (Section 10.4).

The comparison of a composite sample or basket of medicines between countries, rather than individual items, can be used to determine whether medicines are more

expensive, in general, in one country than in another. However, such a comparison is relatively more complex than the other comparisons and requires special statistical methods and skills, as well as additional data. This chapter provides some guidance on this, but the assistance of a health economist can be useful.

It should be noted that international comparisons of availability, affordability and price composition of individual medicines are not affected by the factors described above for MPRs and can be performed without adjustment.

10.2   WHERE TO OBTAIN COUNTRY DATA FOR COMPARISON

The HAI web site[1] has a publicly accessible global database dedicated to the storage of country price data collected in accordance with the procedures suggested in this manual. It will allow you and others to compare your data with those from other countries in which similar price surveys have been carried out.

The database can be queried according to:

- price and availability per medicine;
- price and availability per survey;
- summary data from a single survey;
- affordability per survey; and
- affordability per condition.

Fig. 10.1 shows a typical database query and results, in this case, examining the price and availability of salbutamol inhaler in surveys that used 2005 MSH international reference prices for their analysis.

Fig. 10.1   Database query for retail pharmacy salbutamol inhaler price and availability

You are strongly encouraged to send your completed workbook to HAI so that it can be checked and entered in this publicly accessible database.

In addition to the global database, a data extraction tool has been designed to facilitate generation of results across multiple surveys. The data extractor allows

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[1]   http://www.haiweb.org/medicineprices

for more specificity in the extraction of survey data and will be developed to adjust data for inflation, MSH year used and country wealth. The data extractor is available upon request by contacting HAI.[1]

10.3 CHOOSING WHAT TO COMPARE

10.3.1 Choosing countries

Normally, when making comparisons, the countries with which you compare your data should be similar in terms of economic wealth and development; be of similar population size; and have a health system similar in structure and use to that in your country. Neighbouring countries are not always the most appropriate choice, though comparing neighbouring countries may be relevant when investigating subregional approaches to improving access to medicines, e.g. pooled procurement or subregional medicine pricing policies. The choice of countries for comparison will vary, depending on the purpose of the comparison; sometimes comparisons to very poor or very rich countries can carry powerful advocacy messages, e.g. to show that the prices in a relatively poor country are the same as in a relatively rich country. If the survey data chosen are from a different year to that of your survey then adjustments of MPRs may be necessary (see Section 10.4).

> As the vast majority of surveys conducted thus far have used MSH reference prices, using a different source of reference prices in your survey will limit your ability to conduct international comparisons and is therefore discouraged.

10.3.2 Choosing medicines

When selecting a medicine whose price is to be compared across countries, ideally it should be one that has one major indication and is used in a similar manner across countries. Often, suitable drugs are those for chronic diseases, such as diabetes medicines like metformin and asthma medication like salbutamol inhaler. Medicines for acute conditions often have multiple indications and their prescribing patterns as well as corresponding market volumes can be very country-specific.

10.4 ADJUSTING DATA IN INTERNATIONAL COMPARISONS

If you are comparing data between two or more surveys conducted in different years, you should adjust the data so that they use the same MSH reference prices; are corrected for inflation/deflation in local currencies; and, if necessary, PPP in the respective countries. The adjustments specified below are recommended.

Public procurement prices: standardize to the same MSH reference price year and adjust for inflation/deflation. PPP adjustment should not be necessary if most medicines are procured as generics since these are available from multiple suppliers within a global marketplace just as for many other non-health commodities, i.e. rich and poor countries should be able to purchase multisource products at around the same price; in practice, national regulations, bargaining power and other factors may limit the degree to which this is true in a particular instance. The prices of single-source (originator brand) products will be more subject to the pricing strate-

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[1] info@haiweb.org

gies of the manufacturing companies and the procurement authority's negotiating power and skills.

Public sector and retail pharmacy patient prices: standardize to the same MSH reference price year, adjust for inflation/deflation and adjust for the local currency's buying power (PPP). The latter step is needed since the cost of living varies between rich and poor countries; the costs of running the retail pharmacy (including pharmacist's salary, local taxes, rental and overheads) and the currency's buying power will affect medicine prices. Therefore, the prices of the latter will vary considerably between countries according to the strength of their local currency.
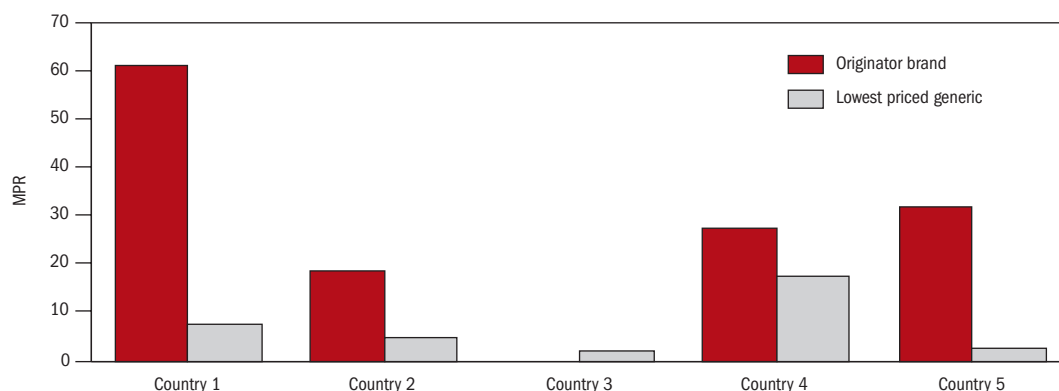
Annex 8 provides basic instructions on how to perform these adjustments along with a sample calculation. In the examples given elsewhere in this chapter, it should be assumed that the appropriate adjustments have been made to allow reliable comparisons of medicine prices.

The large majority of surveys conducted to date have used MSH prices as the standard set of international reference prices to which median local prices are compared. As such, the adjustment instructions provided in Annex 8 assume the use of MSH prices; similar adjustments would also be needed if other reference prices are used.

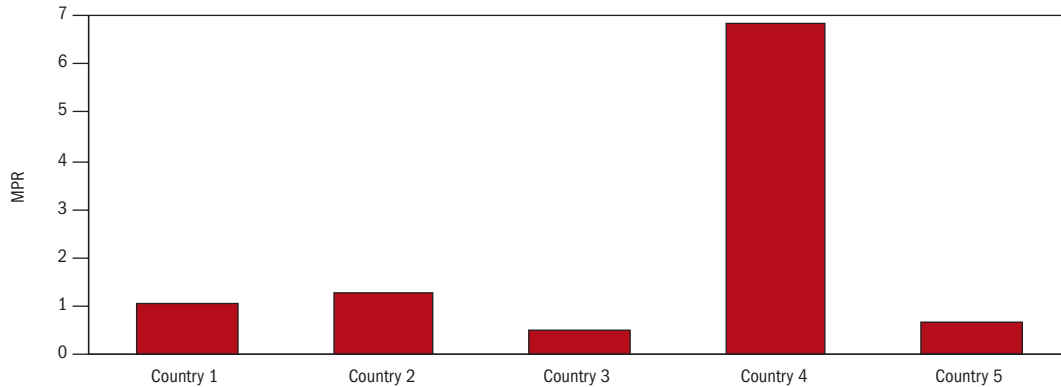## 10.5   COMPARISONS OF THE PRICES OF INDIVIDUAL MEDICINES

When making international comparisons with the survey data, the most robust method to use is the one whereby you compare the prices of individual medicines, i.e. take a medicine and look at its price in various countries. Fig. 10.2 shows a fictitious example of how you can use your data and data from other countries to compare the MPR for the same medicine in several countries. Private sector price ratios for ranitidine in five countries show that while the originator brand MPR in all countries except Country 1 is less than 35 times the international reference price, countries' prices differ markedly from the international benchmarks. Country 1's private sector price for the originator brand is about 60 times the international reference price but only 8 times higher for the generic equivalent. Comparable ratios in Country 4 are 27 (originator brand) and 17 (lowest-priced generic). Notice the difference between originator brand and generic price in each country – the brand premium. The originator product costs almost 8 times that of the lowest-priced generic in Country 1, while in Country 4 the originator is only 1.5 times the price of the generic.

Fig. 10.2   Ratio of local price to international reference price MPR[a] for ranitidine 150 mg tablets, private sector, in five countries (2004)

[a]   Median Price Ratio

Fig. 10.3   Ratio of local price to international reference price MPR[a] for lowest-priced generic omeprazole 20 mg capsules, private sector, in five countries (2004)

[a]   Median Price Ratio

You can, of course, further simplify this by, for example, comparing only the originator brand price ratios or only the lowest-priced generic price ratios between countries, as in Figure 10.3. In this example, the price of lowest-priced generic omeprazole in Country 4 is 7 times higher than in the other selected countries. It would be worth investigating why this is so.

Each of the surveys using this approach employs the same set of reference prices for all studies conducted in a given year, so the MPR for originator brand ranitidine or omeprazole in Country 3 can be compared directly to its equivalent in Country 1 or any other country. These can be adjusted for PPP, where necessary, as explained in Annex 8. Remember, an MPR of 1 means that the medicine's price is exactly equal to the international reference price; a median price of 10 means that it is 10 times more expensive than the international reference price, and so on.

You should not add up or average these median prices across different medicines since, for the reasons mentioned above, developing reliable composite price indices requires different methods and additional data. However, it might be useful to identify the four or five highest-and lowest-priced medicines in each country. Where these 'Top Five' and 'Bottom Five' lists differ widely between countries, local charges such as mark-ups, duties and taxes may be contributing more to these differences than manufacturers' selling prices. Where the same items recur in the Top and Bottom Five, the manufacturers' selling prices may be the major component in the retail price. Further investigation of price composition will probably be necessary to ascertain this, before the focus of policy is turned to manufacturers' selling prices.

10.6   COMPARISONS OF THE AVAILABILITY OF MEDICINES

The availability of medicines can be compared in a similar manner to their prices. As with prices, it is possible to compare the availability of baskets of medicines or individual medicines. In the public sector, it is likely that not all survey medicines are supposed to be available in all facilities or levels of care, and it is possible that medicines not on the essential medicines list should not be available at all. In such cases, comparisons of individual medicines rather than baskets of medicines are preferred to avoid making inappropriate comparisons. For private sector medicine outlets, comparing baskets of medicines presents less of a problem although, ideally, they should be matched so that they contain the same medicines in each

basket, for example, only compare core medicines, not supplementary medicines. Comparing individual medicines is also possible. Table 10.1 shows the availability of carbamazepine tablets in private retail pharmacies in five African countries as an example.

The limitations of the methodology should always be borne in mind when making these comparisons; even if a particular medicine is not available on the day of data collection, alternative dosage forms or strengths or therapeutic alternatives may have been available. In addition, be aware that earlier surveys measured *median* availability, whereas later surveys measure *mean* availability.

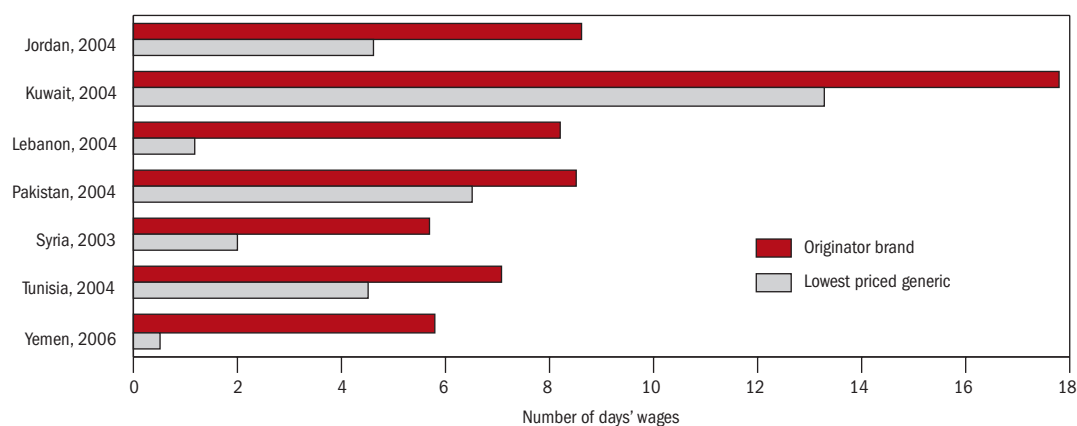**Table 10.1   Availability of carbamazepine 200 mg tablets in private sector medicine outlets in five African countries**

Survey	Median availability	
	Originator brand	Lowest-priced generic
Ethiopia, Sept. 2004	20%	72%
Ghana, Oct. 2004	9%	29%
Kenya, Nov. 2004	59%	81%
Uganda, April 2004	20%	80%
United Republic of Tanzania, Sept. 2004	15%	38%

10.7   COMPARISONS OF THE AFFORDABILITY OF TREATMENT

International comparisons of affordability can be made by transferring the data on the number of days' wages required to pay for a course of treatment (8.6 Analysis of treatment affordability) to a cross-country comparison chart, as in the example in Fig. 10.4.

Fig. 10.4 shows that ulcer treatment with ranitidine bought from a retail pharmacy in Kuwait would cost over 12 days of income for a person on the lowest government wage, while the same treatment course in the other countries would be 6–8 days' wages for the originator brand and 1–6 days' wages for the lowest-priced generic. However, it is important to interpret the results in the context of the country, which can be obtained from the survey reports posted on the HAI web site. In Kuwait, everyone is covered by health insurance, whereas there are millions of people in Pakistan who do not even earn as much money as the lowest-paid unskilled govern-

Fig. 10.4   Intercountry comparison of affordability: number of days' wages needed to purchase 30 days' treatment with ranitidine 150 mg tablets from a private sector medicine outlet

ment worker. Even though ranitidine is more affordable in Pakistan than in Kuwait, it is likely to be unaffordable for much of the population.

Once again, sectors should be compared separately. In these comparisons, there is no need to adjust the data for inflation or PPP since the price of a course of therapy is compared directly to the lowest government wage of that year, with both in local currency units. However, bear in mind that country situations can change over time and old data may be outdated.

As discussed in earlier chapters, the use of the daily wage of the lowest-paid government worker to estimate treatment affordability is limited in that:

- many people may earn less than the lowest-paid government worker or be unemployed;

- other non-discretionary expenditures such as food and housing are not taken into account; and

- many poor people experience seasonal fluctuations in income;

- a number of dependents may live on this wage, who themselves may require medicines, or one person may need more than one medicine, even for the same disease.

Despite these limitations, the daily wage of the lowest-paid government worker has been shown to be a reliable measure that can provide some indication of the affordability of medicines. In conducting international comparisons, it may also be useful to report the proportion of the population living on less than US$ 1.00 or US$ 2.00 per day (accessible from *World Development Indicators* published by the World Bank[1] since medicines that appear affordable for the lowest-paid government worker are still likely to be out of reach for these groups.

10.8   INTERNATIONAL COMPARISONS OF PRICE COMPONENTS

An awareness of how local retail prices are built up is essential information for understanding the significance of differences between the reference prices, which are not retail prices, and the local price. In comparing the price components in your country to those in other countries identify differences in the manufacturer's selling price and add-on costs, of which you might not otherwise have been aware. Such comparisons can help in deciding the level at which advocacy and policy interventions need to be directed, if appropriate.

The staged approach in analysing price components, as described in Chapter 9, facilitates the comparison of price components between countries. Public sector patient prices and private sector patient prices should be compared separately. To ensure comparability, the same categories of medicines should be compared across countries, for example, originator brands vs generics or imported vs locally produced medicines. An example is given in Fig. 10.5 using fictitious private sector data.

It can be seen from the example that much of the patient price of the medicine in Country 1 comes from Stage 1 (predominantly the manufacturer's selling price). Country 2 has a much lower contribution from Stage 1 but has a significant Stage 5 component (tax and dispensing fees). If the prices of medicines in Country 1 are high, Stage 1 components should be targeted. In Country 2, however, it may

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[1]   http://www.worldbank.org/data

Fig. 10.5   International comparison of price components using staged analysis
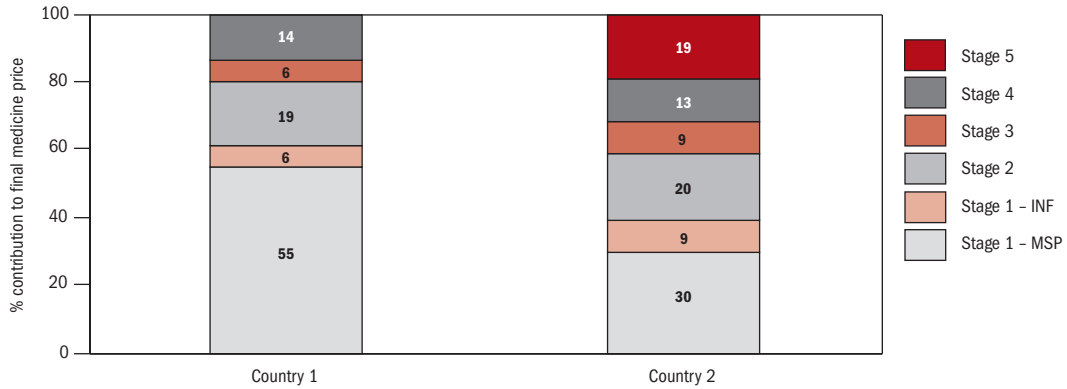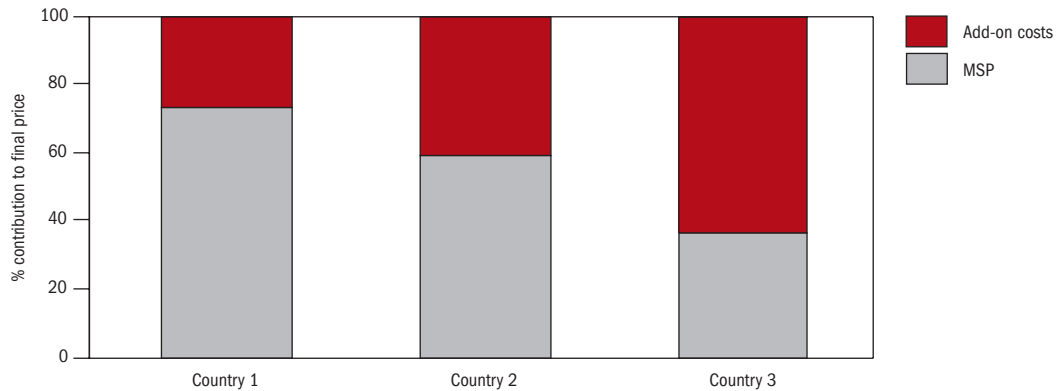

Fig. 10.6   Comparison of the contribution of add-on costs to final selling price for the same medicine across three countries

be more appropriate to investigate whether final taxes and dispensing fees should be reduced. Comparing the individual components within a stage can provide additional information.

Information on price composition from other countries can be found under 'survey results' in the medicine price section of HAI's web site.[1] However, as the staged approach to price components is a new addition to the medicine prices methodology, earlier surveys may not have collected data using this format.

You can compare the per cent contribution of each stage of the supply chain to the final medicine price as in Fig.10.5 or you may choose to examine the contribution of the manufacturer's selling price (MSP) or cost, insurance and freight (CIF) price compared to total add-on costs, as shown in Fig. 10.6. In this fictitious example, MSP makes up a larger proportion of the final price than do add-on costs in Countries 1 and 2. However, in Country 3, add-on costs are more than doubling the MSP price of the medicine and opportunities for reducing add-on costs in the supply chain should be investigated.

Other useful comparisons of price components include:

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[1]   http://www.haiweb.org/medicineprices

1. Comparisons of total cumulative per cent mark-ups by sector across countries

In some cases, it may be useful to show how cumulative per cent mark-ups vary by sector in different countries. A fictitious example is shown in Table 10.2 below. In Country 1, the cumulative per cent mark-ups in the public and NGO sectors are similar while the mark-up in the private sector is substantially higher. In Country 2, there is less variation in cumulative mark-up across sectors.

When conducting such comparisons, data should be analysed for at least two medicines to be sure of a consistent trend.

Table 10.2   Comparisons of total cumulative per cent mark-ups by sector across countries

	Country 1		Country 2	
	Amoxicillin 500 mg cap/tab	Glibenclamide 5 mg cap/tab	Amoxicillin 500 mg cap/tab	Glibenclamide 5 mg cap/tab
Public	43%	38%	67%	67%
Private	87%	113%	78%	92%
NGOs	49%	40%	80%	83%

2. Comparison of a single price component across countries

The fictitious example shown in Table 10.3 below compares the import tariff for generic amoxicillin in four countries.

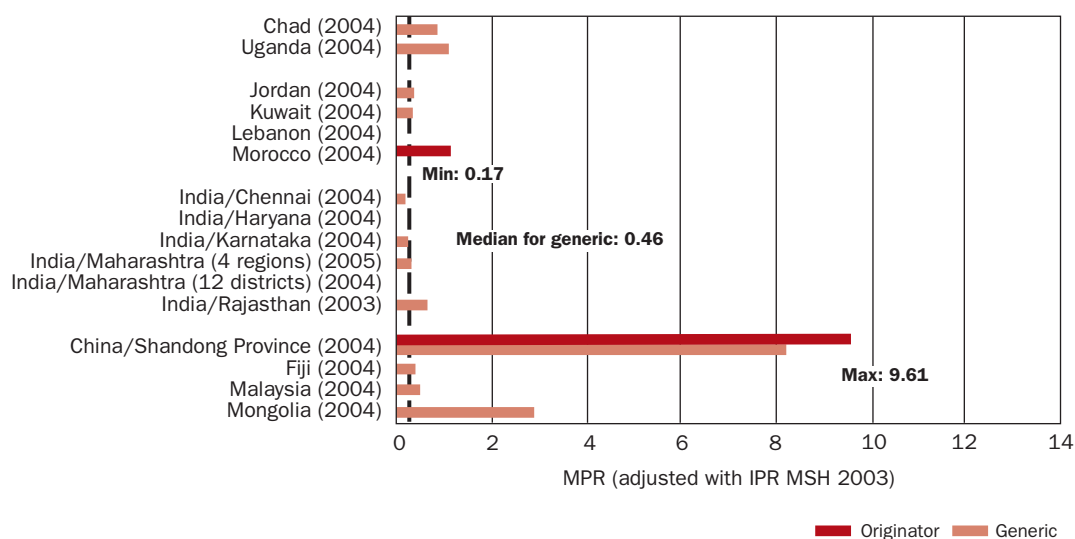**Table 10.3   Import tariff on generic amoxicillin in 4 countries**

	Country 1	Country 2	Country 3	Country 4
Import tariff	2.75%	10%	4%	5%

In Table 10.3, the import tariff applied to generic amoxicillin in Country 2 is more than double that applied in the other countries. In presenting such data in a survey report, it would be important to note whether the same import tariff is applied to all imported generic and originator medicines, and to which sectors in the survey it applies. Other useful information to report is the potential savings that would result from removing the tariff. This information can be obtained by opening the *Price Components: Data Entry* page of the workbook Part II, deleting the data on the import tariff (or other price component being studied), and comparing the new (hypothetical) final price with the actual final price obtained in the survey. (Warning: be careful not to save the workbook if you have deleted data).

10.9   INTERNATIONAL COMPARISONS BY DISEASE GROUP

It is possible to undertake international comparisons of medicines that are used in a particular disease or group of diseases. This has been illustrated recently in a publication that used WHO/HAI survey data to look at price and availability of medicines for chronic diseases (*1*). An example is shown in Fig. 10.7.

The figure dramatically illustrates that metformin tablets are being procured at too high a price in China (Shandong Province) and also in the surveys in Mongolia, Morocco and Uganda compared to other countries (*2*). By also examining other diabetes medicines from the surveys, e.g. glibenclamide, a picture of the affordability and treatment of diabetes medicines can be created. Of course, the basic

Fig. 10.7 Comparison of metformin 500 mg tablets MPRs[a] in public procurement across 16 surveys[b]

MPR (adjusted with IPR MSH 2003)

■ Originator ■ Generic

[a] Median Price Ratio
[b] WHO/HAI, 2006

methodology does not include all medicines used for a particular disease, only certain sample or indicator medicines, and this must be taken into account when interpreting the results.

10.10 INTERNATIONAL COMPARISONS OF PRICES FOR A SAMPLE OF MEDICINES

To find out whether medicine prices systematically differ between countries, some analysts have undertaken comparisons of a representative sample of medicines in different countries. The Governments of Australia, Canada and the USA have commissioned such comparative work in recent years (3,4,5).

A simple average of the medicine prices in the sample means that every medicine in the basket is given equal weight. If some medicines are more important than others (for example, if some account for a very large share of the market and others a very small share), a simple average will understate the share of the more important medicines in the total. In some cases, statisticians assign a weight to the price of each item in the sample to reflect its relative importance. The weighting may also need to take account of differences in market share of the various strengths and dosage forms in which a medicine is available. An average is then calculated of the weighted prices; this is called an index price. This procedure is common with price indices that measure retail prices, for instance. A price index recognizes that some medicines are more important than others, perhaps because of consumption patterns or local disease epidemiology, and it entails assigning relative weights to each item in the sample. Discounting strategies, distribution of market power and other aspects may also need to be accounted for.

The methodology for such studies requires both statistical skills and data which go beyond the scope of the approach to price sampling and comparison described in this manual. For readers who are interested in the details of more ambitious international comparisons, publications in the Reference section at the end of this chapter provide an introduction to the methodology of such comparisons (6) and more detailed methodological discussion (7,8,9).

Despite this, it can be tempting to compare your summary MPR values to those in other surveys. If you decide to make such comparisons of baskets of medicines for your report, such as comparing sector summary MPRs across countries, you must acknowledge the limitations of the WHO/HAI survey methodology, i.e. that each basket does not contain exactly the same medicines and their importance in the market (as given by sales or market share) is not known. You must also be careful about the conclusions that you draw; such comparisons can indicate that there is a difference in price between the countries but they are not definite proof. Be aware that comparing overall combined ratios like this may leave you open to criticism that you are not comparing like with like, especially if you draw inappropriate conclusions. This could discredit your report. People who may be exposed and criticized by the study's findings may prefer to attack the methods used in the study rather than address the results. By limiting yourself to individual medicines, as distinct from composite comparisons, you can be confident that your results are totally defensible.

For the reasons given above, it is recommended that cross-country comparisons be limited to comparing the price ratios, affordability and price components of individual medicines. Comparing the top five and bottom five medicines in terms of cost in relation to reference prices or affordability may be more than enough to support your conclusions and recommendations.

Another option is to identify a basket of medicines that was found in all of the countries you wish to compare, and calculate and compare the summary data (e.g. average per cent availability, median MPR) for this limited set of medicines. This allows international comparisons to be made on the same group of medicines. However, this approach is very resource-intensive in that it involves identifying a basket of common medicines found in all countries, recalculating summary measures on this limited basket and comparing results across countries. Moreover, if only a small number of medicines are available for this comparison, the results will not be representative or as robust as countrywide measures.

10.11 INTERNATIONAL COMPARISONS USING OTHER DATA SOURCES

This chapter focuses on making comparisons of medicine prices across countries using the data derived from WHO/HAI medicine price surveys. Other data sources of medicine prices and health-care spending are available such as public National Health Accounts, IMS statistics[1] and household survey data. By investigating relationships between medicine price survey data and these other data sources and comparing them between countries, it is possible to gain a deeper understanding of medicine pricing issues within a region or group of countries. However, this is beyond the scope of this chapter.

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[1] http://www.imshealth.com

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