

# THE WORLD MEDICINES SITUATION 2011

## MEDICINES PRICES, AVAILABILITY AND AFFORDABILITY

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## **The World Medicines Situation 2011**

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## SUMMARY

- Medicine availability and prices in both public and private sectors are key indicators of access to treatment. Surveys of medicine prices and availability, conducted using a standard methodology, have shown that poor medicine availability, particularly in the public sector, is a key barrier to access to medicines. Public sector availability of generic medicines is less than 60% across WHO regions, ranging from 32% in the Eastern Mediterranean Region to 58% in the European Region. Private sector availability of generic medicines is higher than in the public sector in all regions. However, availability is still less than 60% in the Western Pacific, South-East Asia and Africa Regions. In countries where patients pay for medicines in the public sector, average prices of generic medicines range from 1.9 to 3.5 times international reference prices (IRPs) in the Eastern Mediterranean and Western Pacific Regions, respectively. While public sector availability of originator brand medicines is low, when these medicines were sold to patients their average costs ranged from 5.3 times IRPs in the Eastern Mediterranean Region to 20.5 times IRPs in the European Region.
- Due to low availability of medicines in the public sector, patients are often forced to purchase medicines in the private sector. In this sector, patient prices for lowest-priced generic products ranged from 2.6 times IRPs in South-East Asia to 9.5 times IRPs in the Americas. For originator brand products, private sector prices were at least 10 times higher than international reference prices in all WHO regions. When originator brands are prescribed and dispensed for products that are also available in generic form, patients are paying four times more, on average, to purchase the brand.
- High medicine prices increase the cost of treatment. For example, treatment of an adult respiratory infection with a 7-day course of treatment with ciprofloxacin would cost the lowest-paid government worker over a day's wage in most countries. Costs escalate when originator brands are used: the same treatment would cost the lowest-paid unskilled government worker over 10 days' wages in the majority of the countries studied; in Armenia and Kenya, over a month's salary would be needed to purchase this treatment. Additional problems of affordability face people living with chronic diseases due to the lifelong nature of treatment and the frequent need for combination therapy.
- Countries should intensify efforts to measure and regularly monitor medicine prices and availability, and adopt policy measures to address the issues identified. A range of policy options are available to address issues of high prices and low availability of medicines. Low public sector availability can be addressed through improved procurement efficiency, and adequate, equitable and sustainable financing. Medicine prices can be reduced by eliminating duties and taxes on medicines and promoting the use of quality-assured generic medicines. Mark-ups can also be regulated to avoid excessive add-on costs in the supply chain. The most appropriate actions to follow depend on a country's individual survey results and their underlying determinants, as well as local factors including existing pharmaceutical policies and market situations.

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**1.1****INTRODUCTION**

High medicines prices, low affordability and poor availability are key impediments to access to treatment in many low- and middle-income countries (1-9). Certainly, in those countries where the majority of the population still buys its medicines through out-of-pocket payments, the high cost of medicines (relative to the household budget) means that an illness in the family exposes that family to the risk of catastrophic expenditure. Too often the choice is made to go without.

Inequity in medicines access is widely perceived as symptomatic of weaknesses in the health-care system and represents a failure on the part of national governments to fulfil their obligations towards their citizens in terms of their right to health (see also chapter on *Access to medicines as part of the right to health*). Ensuring equitable access to quality pharmaceuticals is thus a key development challenge and an essential component of health system strengthening and primary health care reform programmes throughout the world. The Millennium Development Goals (MDGs) acknowledge the critical importance of improving access to medicines in setting MDG target 8E, which is:

“in cooperation with pharmaceutical companies, to provide access to affordable essential drugs in developing countries”.

Improved access is also a prerequisite to the achievement of several other MDGs, namely MDG 4 (reducing child mortality), MDG 5 (improving maternal health) and MDG 6 (combating HIV/AIDS, malaria and other diseases).

This chapter provides an overview of data on the availability of medicines and on medicine prices and their affordability, three measures which serve as key indicators of access to treatment (2). Comparisons between the public and private sectors are made, with a particular focus on the situation in low- and middle-income countries. The chapter also briefly reviews a range of policy options and other interventions for improving medicines availability and affordability, highlighting some successes in countries that have recently taken steps to address these issues.

Much of the data reported in this chapter are derived from surveys of medicine prices and availability conducted using a methodology developed through a collaborative project between WHO and the nongovernmental organization (NGO), Health Action International (see Box 1.1). The WHO/HAI survey methodology was originally developed to address the lack of comparability (10) between the results of earlier attempts to measure medicines prices in low-income and middle-income countries (11-14). Despite certain inevitable limitations, the WHO/HAI methodology has evolved over time to become an internationally-accepted standard way of collecting reliable evidence on medicine prices and availability (4,15).

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**1.2****PRESENT SITUATION**

The situation analysis presented here is based on the results of a total of 53 surveys conducted between 2001 and 2008. Table 1.1 provides a breakdown of the number of countries that have carried out pricing surveys according to WHO/HAI methodology by WHO region.

BOX 1.1

**WHO/HAI standard methodology for measuring medicine prices, availability, affordability and price components**

The WHO/HAI methodology for measuring medicine prices relies on data that are collected through visits to medicines outlets in the public sector, the private sector and any other sectors that serve as important medicine dispensing points (e.g. NGOs, mission hospitals). For each medicine included in the survey (a standard “basket” of 50 medicines is recommended), information on the final price of both the originator brand and the lowest-priced generic equivalent found at each medicine outlet is sought. Data on government procurement prices are also collected, as are data on add-on costs (i.e. the incremental charges that added to medicines as they proceed through the supply and distribution chain). Data collection is conducted by trained data collectors, following which data are double-entered into a pre-programmed Excel workbook that performs a standardized analysis of the data.

For each medicine, the **availability** is calculated as the percentage (%) of medicine outlets in which the medicine was found on the day of data collection. Price results are reported as **median prices** in the local currency and also as **median price ratios** (MPRs). The median price ratio compares local prices with a set of international reference prices (IRPs) reported by the US-based Management Sciences for Health (MSH), and is an expression of how much greater (or lower) the median local medicine price is than the international reference price. A MPR of 2, for example, means that the local medicine price is twice the international reference price. The MSH international prices represent the median prices of multi-sourced medicines offered to low- and middle-income countries by different suppliers. Generally speaking, individual country data are not adjusted for differences in the MSH reference price year used, exchange rate fluctuations, national inflation rates, variations in purchasing power parities, levels of development and a number of other factors.<sup>a</sup>

Medicine prices are also compared with the daily wage of the lowest-paid unskilled government worker in order to derive a measure of treatment **affordability**. Affordability is calculated as the number of days’ wages required to purchase selected courses of treatment for common acute and chronic conditions. Comparisons are possible across sectors, product types (e.g. originator brand versus generic) and regions within a country. Finally, data on medicines prices are broken down into **components** to show the cumulative mark-up applied to the base price of a medicine (e.g. manufacturer’s selling price), as well as the relative contribution of various add-on costs to the final medicine price.

A more detailed description of the WHO/HAI methodology, as well as country-specific data and reports, can be obtained from the HAI web site: (<http://www.haiweb.org/medicineprices/>).

<sup>a</sup> *Measuring medicine prices, availability, affordability and price components*, 2nd ed. Geneva, World Health Organization and Amsterdam, Health Action International, 2008. Available at: <http://www.haiweb.org/medicineprices/manual/documents.html>

**TABLE 1.1 Distribution of completed surveys of medicine prices and availability conducted according to the WHO/HAI survey methodology, by WHO region, 2001–2008**

WHO region	Number of participating countries	Number of completed surveys <sup>a</sup>
Africa	11	11
The Americas	6	6
South-East Asia	4	10
Europe	6	6
Eastern Mediterranean	11	14
Western Pacific	5	6

<sup>a</sup> Note that three countries, China (Western Pacific), India (South-East Asia) and the Sudan (Eastern Mediterranean) conducted multiple state or regional surveys.

Source: Data provided by HAI, 2009 (see also <http://www.haiweb.org/medicineprices/>).

1.2.1

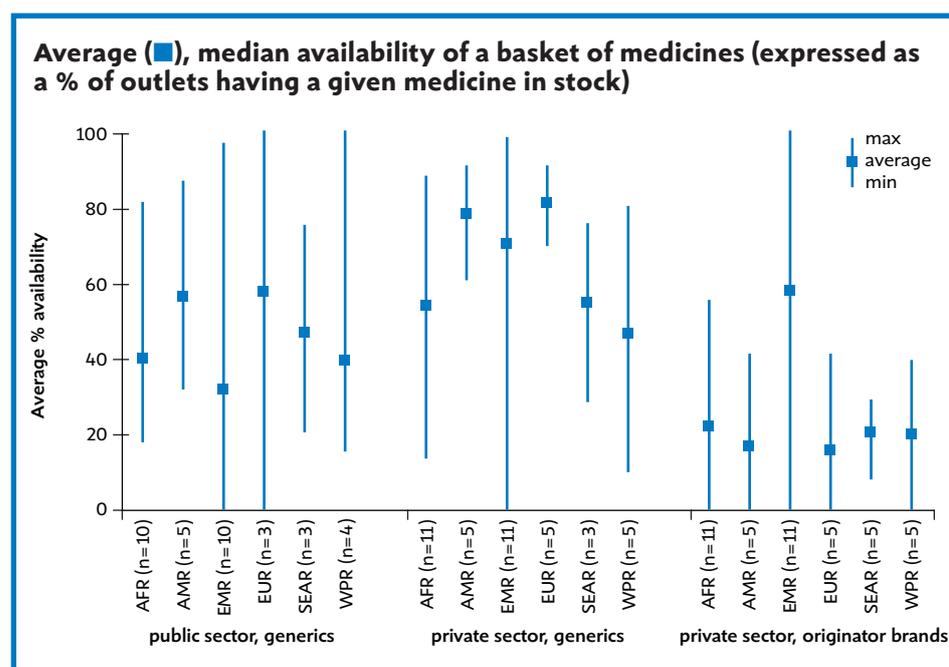
Medicine availability

Public sector

Figure 1.1 shows the average (and minimum and maximum) median availability<sup>1</sup> of a basket of medicines in countries for which data have recently been collected using the WHO/HAI survey methodology, grouped by WHO region. Individual country data are provided in the Statistical Annex (see Annex 2a & 2b). The figure reveals that in all regions, public sector availability of generic medicines is, on average, less than 60%, ranging from 32% in the Eastern Mediterranean to 58% in Europe.<sup>2</sup> However, a large variation is observed across the individual countries of all regions; the largest differences between lowest and highest median availability are seen in the Eastern Mediterranean (where availability ranges from 0% to almost 100%) and Europe, and the smallest in the Americas and South-East Asia (Figure 1.1).

The availability of originator brands in the public sector is low, with most governments favouring the purchase and distribution of lower-priced generic equivalents. Countries with the highest public sector availability of originator brand products are Kuwait (12.0%), the Islamic Republic of Iran (13.3%), United Arab Emirates (16.7%) and Ukraine (50.0%).<sup>3</sup>

FIGURE 1.1



*Availability of generic medicines in public sector is less than 60%. Availability of originator brands in the private sector is lower than generic medicines.*

n = number of countries. Where multiple state or provincial surveys have been conducted (China, India, Sudan), results from individual surveys have been averaged without weighting.

Source: Based on results of surveys of medicine prices and availability conducted using the WHO/HAI standard methodology and collated by HAI (<http://www.haiweb.org/medicineprices/>).

<sup>1</sup> Surveys conducted since 2008 measure mean availability, as opposed to median availability. However, for the purposes of this report, mean availability data has been recalculated to median availability so as to be consistent with surveys conducted prior to 2008.

<sup>2</sup> The sample of countries from Europe consists of the following former Soviet republics: Armenia, Kazakhstan, Kyrgyzstan, Tajikistan, Ukraine and Uzbekistan.

<sup>3</sup> In Ukraine, 11 originator brand products were excluded from the survey as they are not marketed in the country, giving a relatively high median availability of the remaining 13 originator brand products that were purposefully included.

### Private sector

Private sector availability of generic medicines is higher than that in the public sector in all regions (Figure 1.1). Nevertheless, median availability is still less than 60% in Africa, South-East Asia and the Western Pacific. Large differences in availability across individual countries within the same region are again observed; the difference between the lowest and highest availability is as much as 98% and 74% in the countries of the Eastern Mediterranean and Africa, respectively. Elsewhere, particularly in Europe and the Americas, the range in availability is much smaller, 21% and 27%, respectively. This may be due, at least in part, to the smaller number of participating countries in these regions (only six in each region). Availability of originator brands in the private sector was consistently lower than that of generics in all regions. Availability of these products is less than 25% in all regions, with the exception of the Eastern Mediterranean where average private sector availability of originator brands is notably higher (58%) but with a wide range across individual countries (median availability ranges from 0% in the Sudan and Syrian Arab Republic to 100% in the United Arab Emirates).

## 1.2.2

### Medicine prices

#### Public sector

In many countries, medicines are provided free to all patients in the public sector. Where this is the case, price data are not reported. In countries where medicines are only provided free to some groups of patients (e.g. children, the elderly), data on the price paid by those who are required to pay for their medicines are collected. In such cases, the price is the full price paid, even if patients themselves only pay part of this price.

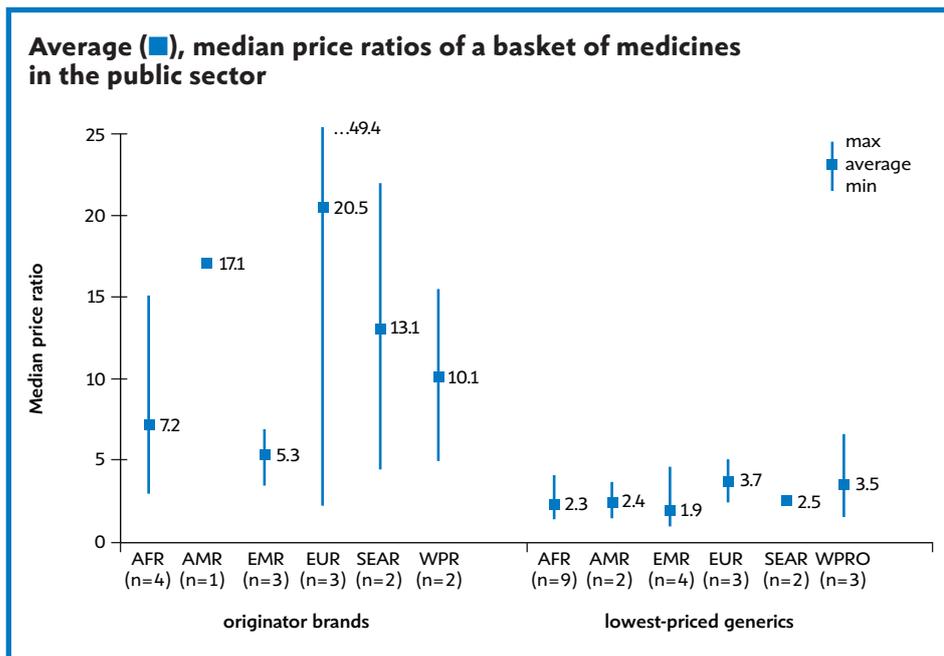
As indicated in Box 1.1, in WHO/HAI methodology medicine prices are reported as median price ratios or MPRs, which express median local prices in relation to a set of MSH IRPs (as the denominator) (16). Figure 1.2 charts average private sector median MPRs for both originator brand and generic medicines, by WHO region. Median MPR data for individual countries, for both the public and private sectors, are listed in the Statistical Annex (Annex 2a & 2b).

In the present sample of 23 countries in which patients are required to purchase medicines in the public sector, prices paid for the lowest-priced generic medicines, on average, range from 1.9 times the international reference price (IRP) in the Eastern Mediterranean to 3.7 times the IRP in Europe. In some individual countries, local prices for generics exceed the international reference prices by a factor of four and above: examples include, Ukraine (MPR, 4.0), Sudan (MPR, 4.4), Kazakhstan (MPR, 4.8) and the Philippines (MPR, 6.4). In the Ukraine, Kazakhstan and the Philippines, high procurement prices (3.5, 3.0 and 5.1 times the IRPs, respectively) are largely responsible for the high patient prices in the public sector. Conversely in Sudan, mark-ups in the public sector supply chain (patient prices are 2.4 times higher than government procurement prices) are driving up the prices of medicines for public sector patients.

Although the availability of originator brands in the public sector is generally low, when such products are sold to patients, prices tend to be very high. As indicated in Figure 1.2, average prices range from 5.3 times the IRP in the Eastern Mediterranean to 20.5 times the IRP in Europe. The highest price difference was found in Tajikistan, where median prices were 49.4 times the IRP; however, in this particular case, the median price calculation is based on just four branded products, all of which also recorded low availability (20–50%).

*Public sector prices paid for the lowest-priced generic medicines, range from 1.9 times to 3.7 times the international reference price (IRP) and from 5.3 times to 20.5 times for originator brands.*

FIGURE 1.2



n=number of countries. Where multiple state or provincial surveys have been conducted, results from individual surveys have been averaged without weighting.

Baskets of medicines included in the analysis differ between countries. Data have not been adjusted for differences in the reference price year used, exchange rate fluctuations, national inflation rates, variations in purchasing power parities and levels of development, among other factors.

Source: Based on results of surveys of medicine prices and availability conducted using the WHO/HAI standard methodology and collated by HAI (<http://www.haiweb.org/medicineprices/>).

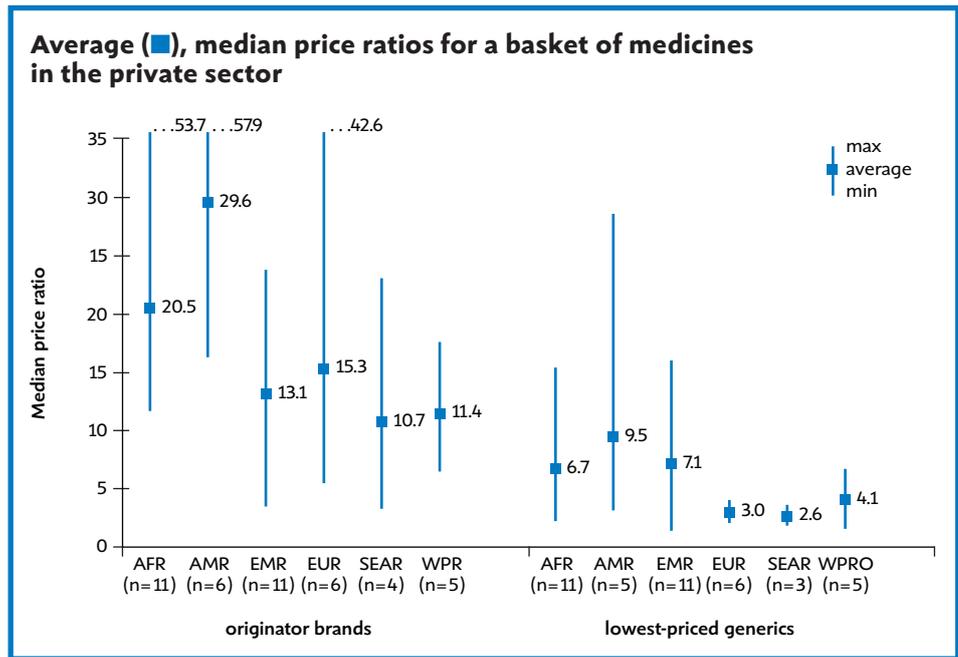
### Private sector

Low availability of medicines in the public sector means that many patients are forced to purchase medicines from the private sector, often at prices they can ill afford. Comparison of Figures 1.2 and 1.3 reveals that, broadly speaking, medicine prices – especially that of generics – are higher in the private sector. In the case of generic products, two distinct patterns emerge across the WHO regions. Among the 43 countries surveyed, moderately high MPRs are observed in Europe (average MPR, 3.0), South-East Asia (average MPR, 2.6) and the Western Pacific (average MPR, 4.1), with only small variations across the individual countries in each region (Figure 1.3). However, while variation across countries in a given region may be small, variation across individual medicines within a country can be substantial. For example, in Mongolia, the price of individual generic medicines ranged from 0.75 to 120.13 times the IRP. The three remaining regions, Africa, the Eastern Mediterranean and the Americas, have in common not just substantially higher MPRs for generic medicines (average MPRs of 6.7, 7.1 and 9.5, respectively) but also much larger price variations between individual countries (Figure 1.3). In the Eastern Mediterranean, MPRs vary from 1.32 in the Islamic Republic of Iran to 1.7 in Kuwait; in Africa, from 2.2 in Ethiopia to 15.1 in Chad, and in the Americas, from 4.5 in Bolivia (Plurinational State of) to 28.3 in El Salvador (Figure 1.3).

*Private sector prices of originator brand medicines were at least 10 times higher than the corresponding international reference prices, and were as much as 20 and 30 times higher in Africa.*

Price differentials for originator brands are much higher than lowest-priced generic equivalent products even for off-patent medicines. In all WHO regions, prices of originator brand medicines were, on average, at least 10 times higher than the corresponding international reference prices, and were as much as 20 and 30 times higher in Africa and the Americas, respectively. Countries with the highest private sector differentials between local and IRPs for originator brand medicines include Bolivia (MPR, 30.3), Tajikistan (MPR, 42.6), Sao Tome and Principe (MPR, 53.7) and El Salvador (MPR, 57.9). Although the baseline IRP

FIGURE 1.3



n=number of countries. Where multiple state or provincial surveys have been conducted, results from individual surveys have been averaged without weighting.

Baskets of medicines used in the analysis differ between countries. Data have not been adjusted for differences in the reference price year used, exchange rate fluctuations, national inflation rates, variations in purchasing power parities and levels of development, among other factors.

Source: based on results of surveys of medicine prices and availability conducted using WHO/HAI standard methodology and collated by HAI (see <http://www.haiweb.org/medicineprices/>).

used to calculate these MPRs is often the procurement price for the generic product, this fact alone does not account for the high prices of originator brands widely observed in the private sector.

In most countries, high medicine prices are a consequence of high prices charged by manufacturers and/or high add-ons in the supply chain, such as wholesale and retail margins and government-imposed duties and taxes. Both of these factors, acting either singly or in combination, can substantially increase the final price of medicines to patients in both the public and private sectors. In the limited number of low- and middle-income countries for which data are available, private sector wholesale mark-ups range from 2% to 380%, whereas retail mark-ups range from 10% to 552% (4). In countries where value added tax (VAT) is applied to medicines, the amount charged varies between 4% and 25% (17,18). In addition to the various mark-ups and taxes, publicity and marketing costs incurred by manufacturers for promoting medicines are often also passed on to the consumer, and can thus represent a significant component of the final price (19).

From the available WHO/HAI survey data, it has been possible to calculate difference in price between selected originator brand products and their lowest-price generic equivalents, the so-called “brand premium”. Table 1.2 shows the results of this analysis, averaged across each WHO region. Individual country data are reported in the Statistical Annex (see Table Annex 2c & 2d). It is apparent that when originator brand medicines that are also available in generic form are prescribed and dispensed, patients are paying as much as four times more, on average, for the branded version. For many patients, price differentials of this magnitude could represent the difference between being able to have the medicine and going without. In individual countries, brand premiums ranged from as low as 1.1 in Kuwait to 13.2 in China; however, it should be noted that the low brand premium in Kuwait was not the result

**TABLE 1.2 Average, minimum and maximum brand premiums (difference in price between originator brand products and their lowest-priced generic equivalents), in the private sector, by WHO region**

WHO region	Number of countries	Average brand premium	Range (minimum–maximum)
Africa	10	3.9	2.1–5.7
The Americas	5	4.1	1.7–6.5
South-East Asia	3	4.8	1.2–9.4
Europe	6	5.3	2.4–13.2
Eastern Mediterranean	11	2.8	1.1–7.0
Western Pacific	4	5.5	2.5–13.2
All countries	39	4.1	1.1–13.2

Where multiple state or provincial surveys have been conducted, results from individual surveys have been averaged without weighting.

Baskets of medicines included in the analysis differ between countries. Data have not been adjusted for differences in the reference price year used, exchange rate fluctuations, national inflation rates, variations in purchasing power parities and levels of development, among other factors.

Source: Based on results of surveys of medicine prices and availability using the WHO/HAI standard methodology and collated by HAI (see <http://www.haiweb.org/medicineprices/>).

of low originator brand prices but of high generic prices (MPR, 15.7 for generics; MPR, 17.9 for originator brands).

### 1.2.3

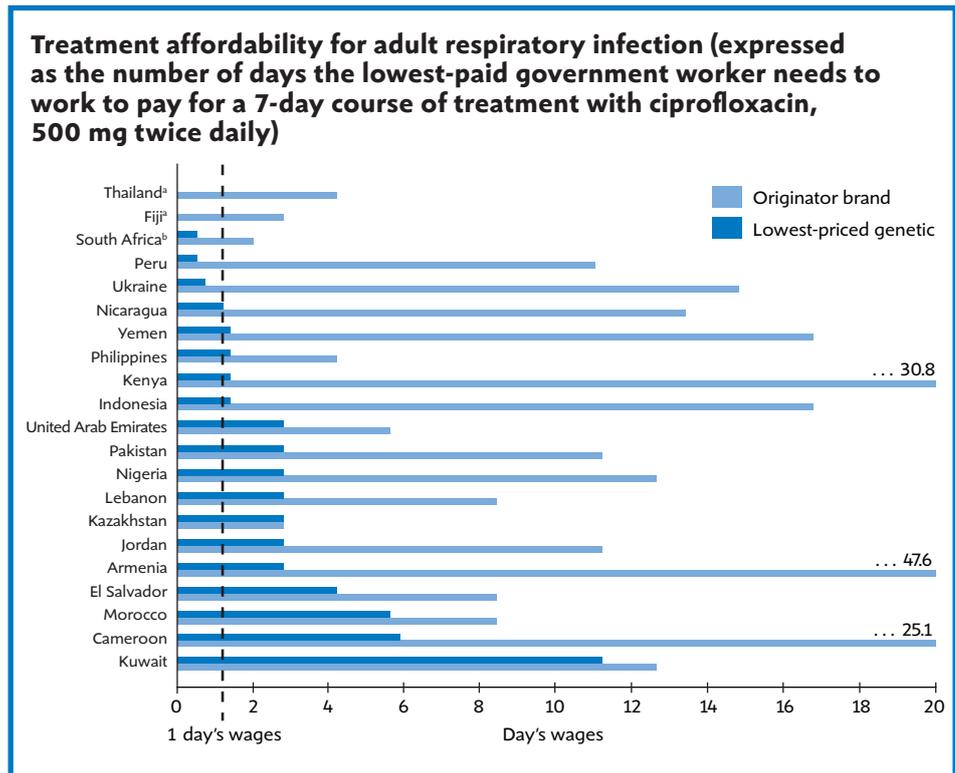
#### Affordability of purchasing treatment in the private sector

Figure 1.4 reflects the very large differences in the affordability of both originator brand products and lowest-priced generics that currently exist in many countries. The figure shows the number of days the lowest-paid government worker needs to work in order to be able to pay for a standard course of treatment for an adult respiratory infection (a 7-day course of ciprofloxacin, 500 mg capsule or tablet, twice daily) in the 20 countries for which such data were available for both product types, originator brand and lowest-price generic. A course of treatment that costs the equivalent of one day's salary of the lowest-paid government worker is generally considered affordable; treatments that cost more than this are classed as unaffordable. It should be noted that large sections of the populations in low- and middle-income countries earn less than the lowest-paid government worker, and as such, the true degree of unaffordability is likely to be underestimated using this indicator.

Figure 1.4 reveals that even when lower-priced generic medicines are available, treatment is beyond the reach of many people in low- and middle-income countries; treatment of respiratory infection with generic ciprofloxacin costs over a day's wage in nearly all countries except Thailand (< 0.1 day's wage), Fiji (< 0.1 day's wage), South Africa (0.5 day's wage), Peru (0.5 day's wage) and the Ukraine (0.7 day's wage). Treatment with generics costs over 2 days' wages in over half of the countries studied. The position is far worse when originator brands are considered; treatment with the originator brand product would cost the lowest-paid government worker over 10 days' wages in over half of the countries studied; in Armenia and Kenya, the equivalent of over a month's salary would be needed to purchase this treatment. Nowhere did treatment with a branded product cost less than 2 days' wages (Figure 1.4). On this basis, treatment can be described as "consistently unaffordable" not only for the lowest-paid government worker, but also for the many people earning less than this.

*Treatment of pneumonia with lower priced generic is beyond the reach of many people in low- and middle-income countries.*

FIGURE 1.4



<sup>a</sup> Affordability is calculated as 0.1 day's wages.

<sup>b</sup> Results of a sub-national survey conducted in Gauteng Province.

Source: Based on results of surveys of medicine prices and availability conducted using the WHO/HAI standard methodology and collated by HAI (<http://www.haiweb.org/medicineprices/>).

The problem of medicine unaffordability is further illustrated in Box 1.2 which describes the results of a recent survey of antimalarial use in Uganda. Despite strong commitment to introduce the newer, more effective artemisinin-based antimalarials into the mainstream health-care system, the lack of availability of these first-line antimalarials in the public sector (where they are free), is driving patients to the private sector where up to 11 days of average household income is needed to purchase treatment for a five-year-old child.

People living with chronic diseases face additional problems of affordability due to the lifelong nature of treatment required. Spending a day's wages as a one-time expenditure to treat an acute condition may be within reach for some, but if this sum is deducted from each monthly salary on a regular basis, the financial impact of ill health is clearly going to be much greater. Whereas traditional financial coping mechanisms, such as borrowing or selling household goods, can be used to fund a one-time payment to treat an acute illness, chronic disease treatment is far less amenable to such strategies. Moreover, chronic diseases often require treatment with combination therapy; this can increase costs considerably and further reduce affordability.

*People with chronic diseases requiring lifelong treatment have greater problems of affordability.*

Affordability for chronic combination treatment of hypertensive diabetics who require both oral hypoglycaemics (e.g. metformin) and angiotensin-converting enzyme (ACE) inhibitors for high blood pressure (e.g. captopril) is shown in Figure 1.6. Even for the oral hypoglycaemic alone, a 1-month supply of the lowest-priced treatment regimen using generics costs over a day's wages in the majority of countries for which data are available. In the United Republic of Tanzania, for example, this treatment would cost the lowest-paid unskilled government worker the equivalent of over 5 days' wages. The combined therapy, the oral hypoglycaemics and ACE-inhibitor, would cost the lowest-paid government worker over 2 days' wages in all countries except Fiji and the Islamic Republic of Iran, and as much as 15 days' wages in Ghana.

## BOX 1.2

**Access to effective antimalarial medicines in Uganda**

Malaria is a significant health problem in Africa, particularly in Uganda where malaria accounts for up to 50% of the country's morbidity and mortality. Recent years have witnessed a surge in both national and international interest in reducing the malaria burden and thus willingness and ability to tackle this disease is currently at an unprecedented level. New funding, tools and leadership have emerged, and an effective class of new medicines, artemisinin combination therapies (ACTs), has been developed to replace failing medicines. Since 2004, there has been a strong commitment in many countries to make these artemisinin-based products more widely available in the public sector.

The cost of the new ACTs is significantly greater than that of the older classes of drugs such as chloroquine and the previously recommended first-line treatment, sulphadoxine+pyrimethamine. In Uganda, ACTs are purchased for the public sector largely through international funds such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, and are provided free of charge to patients. Despite such efforts, availability problems mean that ACTs remain unaffordable and inaccessible to a large part of the population, many of whom live below the poverty line and predominantly in rural areas. Many Ugandans are still having to seek treatment for malaria through the private sector, and are funding their treatment through out-of-pocket payments.

In 2007, the Ministry of Health Uganda and Medicines for Malaria Venture (MMV) carried out a market survey that measured availability, affordability and price of all antimalarial medicines, using techniques based on the WHO/HAI methodology. The purpose of the study was to contribute to the evidence base used by national and international policy-makers interested in expanding access to effective, affordable, high-quality ACTs in malaria-endemic countries, such as Uganda. More specifically, the study was intended to inform the design of international financing mechanisms to subsidize the manufacturers' price of ACTs, and in so doing, reduce local patient prices.<sup>a</sup> The study found that:

- Although the existing supply chain is relatively successful in delivering antimalarials, even down to local levels, it continues to provide mainly cheap, ineffective antimalarials.
- The recommended artemisinin-based treatment is being provided for free in public/mission facilities, but availability is a frequent problem; in some districts, only 50% of public health facilities were found to have regular supplies of ACTs, and many were vulnerable to stock-outs between deliveries.
- In some districts, only 16% of outlets that provide medicines were offering public sector care; in others, as many as 45% of the outlets selling medicines were not legally permitted to do so (many of these outlets could, however, easily be (re)licensed to sell medicines).
- In some districts, as few as 4% of private sector outlets stocked ACTs.
- ACTs typically cost up to 30–60 times more than the older, ineffective medicines (see Figure).
- Antimalarials are unaffordable for a significant proportion of the population; only 50% of patients were able to purchase a full course of even the lower-priced (ineffective) antimalarials, and the price of even the cheapest antimalarial found on the market (chloroquine) put it beyond the means of those on the very lowest incomes.

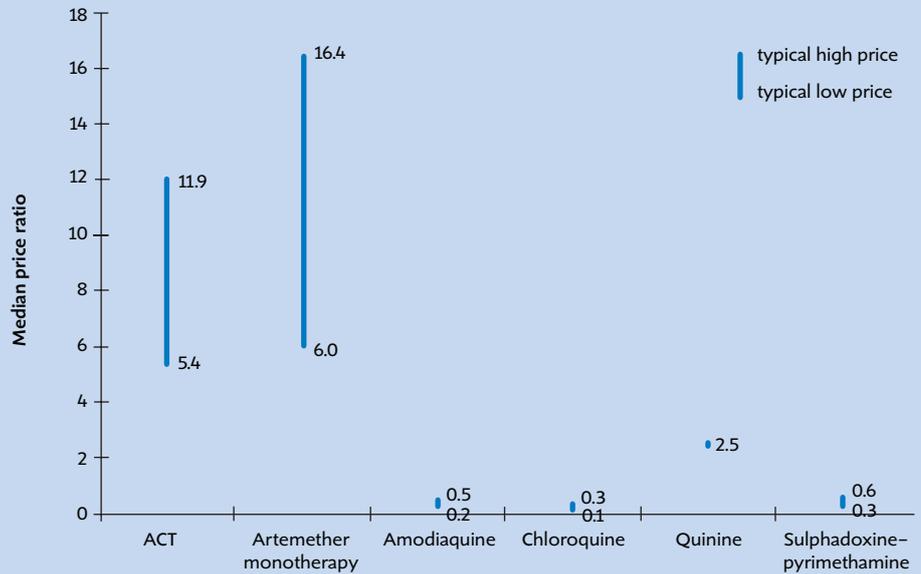
A typical family would have to choose between meeting its basic needs (e.g. for food and education) and purchasing medicines for the treatment of malaria; 11 days' average household income would be needed to purchase a single course of ACT for a five-year-old child.

The study concluded that in order to increase access for all of the population, different interventions are needed for the public and private sectors.<sup>a</sup>

<sup>a</sup> *Understanding the antimalarials market: Uganda 2007. An overview of the supply side. A study by Medicines for Malaria Venture, in collaboration with Ministry of Health Uganda, HEPS and WHO.* Geneva, Medicines for Malaria Venture, 2008. Available at: [http://www.mmv.org/sites/default/files/uploads/docs/publications/Understanding\\_antimalarials\\_market.pdf](http://www.mmv.org/sites/default/files/uploads/docs/publications/Understanding_antimalarials_market.pdf)

BOX 1.2 (continued)

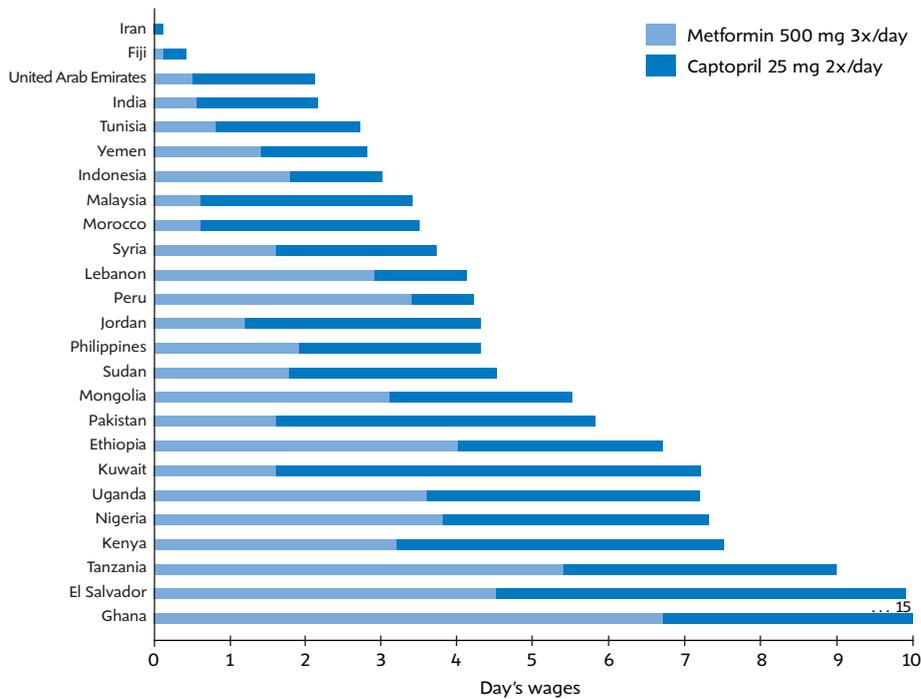
**FIGURE 1.5**  
**Minimum and maximum price ratio<sup>b</sup> of a course of antimalarial treatment (adult) in private for-profit and not-for-profit sectors in Uganda**



<sup>b</sup> The price ranges depicted represent 25th and 75th percentile values found across five categories of private/not-for-profit outlets in nine districts.

FIGURE 1.6

**Treatment affordability for diabetes with concomitant hypertension (expressed as the number of days the lowest-paid government worker needs to pay for a 1-month supply of generic medicines from the private sector for this condition)**



Where multiple state or provincial surveys have been conducted (i.e. India, Sudan), results from individual surveys have been averaged without weighting.

Source: Based on results of surveys of medicine prices and availability conducted using the WHO/HAI standard methodology and collated by HAI (<http://www.haiweb.org/medicineprices/>).

## 1.3

**POLICY OPTIONS FOR IMPROVING MEDICINE AVAILABILITY AND AFFORDABILITY**

In many low- and middle-income countries, medicine prices are high (Figures 1.2 and 1.3), treatments are unaffordable (Figures 1.4 and 1.5) and availability is unreliable (Figure 1.1). At best the situation could be described as worrying, as low availability of medicines is likely to lead to poor disease control. Where out-of-pocket expenditure on medicines is high, the combination of high prices and low availability of medicines is a cause for serious concern, leading as it does to indebtedness or people having to go without the treatment they need. A patient in the Philippines described the reality of her illness in a recent interview, “I cannot accept that I have diabetes... I am scared of losing all properties just because of diabetes. I know that it is expensive to have a disease like this.” (20)

Before embarking on policy reforms to improve access, national policy-makers need to have a clear understanding of the factors that are contributing to high prices and poor availability; this will help ensure that their response is tailored to the national context. Table 1.3 lists a number of possible policy options and specific actions that are open to governments for reducing prices and improving availability. The most appropriate response will likely be multi-faceted and will vary depending on the sector, whether the medicine is imported or locally manufactured and whether it is a single-source originator brand product or a multi-source generic product, as well as other country-specific factors. Broadly speaking, most of the policies listed are aimed at securing a better price from the manufacturer or intermediary (e.g. through price negotiation, external and internal reference pricing) on the one hand, while keeping patient prices as close to the manufacturers’ prices as possible (through cost containment measures, such as regulating mark-ups) on the other. However, no matter how cheap medicines are in the private sector, the fact remains that the poorest sections of the population in low- and middle- countries will still not be able to afford them. For this reason, governments must also seek to implement strategies that make medicines more widely available in the public sector at little or no charge.

*Improving availability of medicines through the public sector at little or no cost to the patient is of paramount importance to ensure access to treatment for the most vulnerable.*

Although increasingly countries are putting in place health insurance systems, only a small minority of people in low- and middle-income countries are covered by such schemes (3). The proportion of people with a health insurance benefit that covers medicines is even smaller. Increasing the availability and uptake of health insurance schemes with an outpatient medicines benefit is therefore a key priority for many governments. In the meantime, however, and while such systems evolve over time, improving availability of medicines through the public sector at little or no cost is of paramount importance to ensure access to treatment for the most vulnerable.

Recent surveys confirm the existence of large price premiums for originator brands and for branded generics (see section 1.2.2). Policies which increase the availability and use of low-priced generic equivalents would mean that many more medicines and treatments could be brought within the reach of those on lower incomes. Such policies could include:

- reducing regulatory barriers to the market entry of generic equivalents (e.g. early-working,<sup>1</sup> fast-tracking applications, reducing the application fee);
- strengthening quality assurance of all products on the market;

<sup>1</sup> The term, “early-working” refers to the use of an invention without the patentee’s authorization for the purpose of obtaining approval of a generic product before the patent expiration date. This procedure may permit the marketing of a generic version promptly after the patent expires (Ref. 21).

TABLE 1.3

**Policy options to improve medicine affordability and availability**

Component of medicine policy	Specific actions to influence price, availability and/or affordability
Selection of essential medicines	<ul style="list-style-type: none"> <li>■ Formulation/updating of essential medicines lists and institutional formularies</li> <li>■ Development and use of Standard Treatment Guidelines</li> <li>■ Development of a therapeutic substitution policy</li> </ul>
Procurement/ purchasing	<ul style="list-style-type: none"> <li>■ Limit to an essential medicines list by international nonproprietary name</li> <li>■ Base quantities on reliable estimates of actual need</li> <li>■ Base on formal written procedures and explicit, predetermined criteria to award contracts (i.e. ensure transparency of the process)</li> <li>■ Plan properly and monitor performance (results should be made publicly available)</li> <li>■ Base on competitive procurement from prequalified suppliers</li> <li>■ Pool procurements at the national level</li> <li>■ Use pharmacoeconomics or external reference pricing (international price comparisons) as a guideline for setting prices of new medicines (single-source)</li> <li>■ For high-priced products, apply pressure for differential prices and consider use of TRIPS<sup>a</sup> flexibilities for medicines under patent</li> </ul>
Distribution system	<ul style="list-style-type: none"> <li>■ Maximize efficiency and transparency</li> <li>■ Control mark-ups with regressive margins and with effective enforcement</li> </ul>
Generic competition	<ul style="list-style-type: none"> <li>■ Establish an effective quality assurance capacity</li> <li>■ Reduce regulatory barriers to market entry of generic equivalents (e.g. early-working, fast-tracking applications, reduce the application fee)</li> <li>■ Permit and promote generic substitution</li> </ul>
Prescribing and dispensing	<ul style="list-style-type: none"> <li>■ Introduce incentives to prescribe and dispense generic medicines</li> <li>■ Improve health professional and public confidence in generics</li> <li>■ Provide unbiased consumer medicine information</li> <li>■ Strictly regulate promotion of products by pharmaceutical companies according to WHO's Ethical Criteria for Medicinal Drug Promotion and ban direct-to-consumer advertising of prescription medicines</li> <li>■ Separate prescribing and dispensing functions; develop and monitor good prescribing and good dispensing practices</li> <li>■ Empower patients through the publishing of prices and availability</li> <li>■ Establish regular monitoring of prices and availability</li> </ul>
Financing	<ul style="list-style-type: none"> <li>■ Encourage pooled and prepaid financing of medicines (e.g. through employment-based or social insurance schemes)</li> <li>■ Support community-based insurance initiatives that focus on improving access to essential medicines</li> <li>■ Establish a social health insurance system covering the whole population</li> <li>■ Ensure that social health insurance benefits are comprehensive, using limited formularies based on cost-effective therapeutic guidelines, and that patients are not required to seek reimbursements</li> <li>■ Abolish taxes and duties on essential medicines</li> <li>■ Introduce minimal or no patient co-payments in the public sector or health insurance systems</li> </ul>

<sup>a</sup> TRIPS =Trade-related aspects of intellectual property rights

- permitting and promoting generic substitution;
- providing incentives for the prescribing and dispensing of low-priced generics;
- improving health professional and public confidence in generics.

Since there are often several contributing causes of high prices and poor availability, a single policy response is unlikely to be sufficient. In order to effect real change and maximize impact, a comprehensive package of policy reforms, fully implemented and rigorously enforced, is usually needed. Monitoring the impact of policy reforms is vital, especially as all policies can have unintended effects. For example, mechanisms that set prices too low can discourage the production and stocking of a product, whereas setting maximum wholesale and retail mark-ups can provide the necessary incentive for supply chain agents to carry those higher-priced products that will yield them a greater return.

The results of the pricing surveys summarized in this chapter suggest that there are ample opportunities to increase availability, lower prices and improve affordability of medicines in all regions and at all levels of economic development. As described in Box 1.3, several countries have already used the results of their surveys to effect positive policy change.

Despite some clear successes, many countries are still failing to implement the policy and programme changes needed to improve access to affordable medicines. Although the challenges faced differ from country to country, a common problem is a lack of technical capacity to link price data to local policy processes (and so determine the causes of high prices and unexplained price variations) and to identify and prepare suitable lines of response. A related issue is the paucity of published evidence on the effectiveness of different policies in low- and middle-income country contexts. In addition, the lack of political commitment, for example, due to conflicting industrial or trade policies, can act as a barrier to the adoption of strategies aimed at reducing medicine prices and improving availability in both public and private sectors.

To address some of the challenges described above, the WHO/HAI Project on Medicine Prices and Availability has initiated a set of activities to strengthen policy guidance on issues relating to medicine prices, availability and affordability, with a specific focus on the needs of low- and middle-income countries. These include a series of in-depth reviews on policies and other interventions to manage medicine prices, increase availability and make medicines more affordable. The results of the reviews will be used to develop a user-friendly series of policy briefs that describe various policies/interventions, their advantages and their disadvantages, and also offer practical guidance on their design, implementation and enforcement. The first set of policy reviews will be available in 2011.

#### 1.4

#### FUTURE CHALLENGES AND PRIORITIES

Ensuring access to essential medicines for all citizens who need them is a state responsibility enshrined in international human rights. It is surprising, therefore, that so few countries have developed comprehensive medicine pricing policies as part of their overall national medicine policy. This represents a critical first step towards tackling the problem of poor access.

Developing medicine pricing policies will always be a challenging task because it brings together the often disparate interests of public health and commerce. While governments, often at the centre of this tension, may wish to strike a balance between the numerous stakeholders engaged in the 'business' of manufacturing and supplying medicines, primacy must be given to public health. People should not have to go without treatments to protect the

## BOX 1.3

**From evidence to action: improving access to medicines**

A number of countries have used the results of recent surveys of medicine prices and availability to inform and guide policy action to improve access to medicines. Examples include:

*China:* The Chinese Government intends to limit the price of branded generics to not much higher than unbranded generics, simplify the public sector medicine supply system, establish a national pooled tendering procurement system and abolish mark-ups in the public sector.

*India:* The Government has recently established retail outlets that only sell unbranded quality generics at no more than 50% of the prevailing maximum retail price.

*Lebanon:* Following the 2004 survey, the Lebanese Government undertook a review of procurement and patient prices, comparing these with prices in Jordan and Saudi Arabia. This resulted in the lowering of prices for a large number of medicines. The Government also implemented regressive margins for importers, wholesalers and retailers and improved transparency by publishing patient prices on a web site and in the Lebanon National Drug Index. The Government also increased the budget for purchasing cancer, HIV and other specialized medicines.

*Tajikistan:* Following a 2005 survey, the Government abolished the 20% VAT on medicines.

*United Arab Emirates:* Following the 2006 survey and subsequent price review, the price of many originator brands and generics were substantially reduced. Margins for chronic disease medicines have also been reduced, resulting in a further 10% reduction in patient prices. To improve the availability of generics in the private sector, the regulatory authority has implemented a priority track for generic product applications where there are less than six generic equivalents on the market. In addition, pharmaceutical companies have been informed that they risk penalties (in the form of cancelled registrations) if they fail to market registered products.

*Yemen:* Following their 2006 survey, the Government of Yemen re-introduced price-setting, limited wholesaler "bonusing" of free stock to 10% and reduced medicine prices (in some cases by up to 50%). Additional measures currently under consideration include reducing costs in the supply chain from 55% to 43%, abolishing taxes on essential medicines (currently subject to 5% customs duty and 5% general tax) and enforcing the ban on illegal middlemen in the supply chain.

vested interest of local pharmaceutical manufacturers or indeed to balance the competing values inherent in international trade.

Inevitably, poor medicine availability in the public sector forces people to purchase medicines from the private sector. Relying on the private sector to fill the void is not the answer, as clearly many treatments, especially those for chronic diseases, are not affordable when purchased from private pharmacies. Instead, governments must ensure the medicines budget is sufficient to meet public health needs. Typically, governments of low-income countries are spending an average of US\$ 3 per capita per year on medicines (see Chapter on Medicine Expenditure), which is clearly inadequate. In addition, government procurement, financing and supply chain management must be of a standard such that essential medicines are available from public health outlets when needed by patients, and that low procurement prices are passed on to patients, preferably with no additional costs.

Of course any national medicine policy has to meet the challenge of comprehensive implementation and stringent enforcement. Without these complementary components, the good intention of regulation may be diluted and fail to achieve its goal.

Access to reliable information on medicine prices and availability in a country is essential for identifying the root causes of poor access and for selecting the right policy interventions from the range of possible options that might be considered. Once policy and/or programme changes have formulated and implemented, routine monitoring of both prices and availability is critical to assess their impact and to ensure that the desired outcomes are being achieved. While possession of data alone will not improve the availability and affordability of medicines, it is a crucial component of any informed policy response.

The landscape of pharmaceuticals is changing fast. New initiatives favour the broader de-linking of the research and development costs of new medicines from the patient price (e.g. through use of patent pools<sup>1</sup>); subsidizing the procurement price; and encouraging research and development into neglected diseases. This gives reason to hope that access to innovative medicines of proven therapeutic value may be on the horizon for many people who otherwise would have little chance of benefiting from them in their lifetime. Such initiatives, however well-intentioned, must be carefully monitored to ensure that the benefits of innovation are optimized and that patients are the ultimate beneficiaries.

In the shorter term, one of today's most immediate challenges is the growing market in higher-priced branded generic (off-patent) medicines relative to their unbranded equivalents. Gains made in lowering the prices of essential medicines – which have expanded access to treatments – will be threatened if there is a shift towards the procurement and use of higher-priced branded generic products in both the public and private sectors. Of equal concern is the promulgation of the myth that expensive medicines are necessarily better than their lower-priced equivalents. This myth needs to be overcome by assuring product quality, government purchasing by the generic name, (lowest-priced) generic substitution and most importantly, by conducting public education campaigns that build confidence in the use of lower-priced products of assured quality.

Despite the gains made in recent years, in terms of the number of people accessing treatment through specific disease programmes, for diseases such as HIV/AIDS, the fact remains that 30 years after the Alma-Ata Declaration and the launch of the health-for-all movement, patients are still not getting all the essential medicines they need. Without concerted efforts to address high prices, unaffordable treatments and unreliable availability, this situation will continue to threaten the health and well-being of people worldwide.

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<sup>1</sup> In July 2008, the UNITAID board decided in principle to establish an international AIDS medicines patent pool to deal with both access and innovation issues related to the medicines patents. A patent pool would enable others, such as generic industries, to make use of the patents to develop, produce and sell AIDS medicines in developing countries at low cost in exchange for the payment of a royalty to the pool to remunerate the patent holders (ref.21).

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#### **ABBREVIATIONS**

ACE	Angiotensin-converting enzyme
ACTs	Artemisinin combination therapies
HAI	Health Action International
IRPs	International reference prices
MDG	Millennium Development Goal
MPR	Median price ratio
VAT	Value added tax

## ANNEXES

### Annex 1. Surveys included in the secondary analysis

Country (survey date)	WHO region	World Bank Income Group (2008/09)
Armenia (11/2001) <sup>a,b,c</sup>	European	lower-middle
Bolivia (11/2008)	Americas	lower-middle
Brazil, Rio de Janeiro State (10/2001) <sup>a,b,d</sup>	Americas	upper-middle
Cameroon (07/2005)	Africa	lower-middle
Chad (05/2004)	Africa	low
China, Shandong Province (10/2004)	Western Pacific	lower-middle
China, Shanghai (09/2004)	Western Pacific	lower-middle
Colombia (10/2008)	Americas	lower-middle
El Salvador (11/2006)	Americas	lower-middle
Ethiopia (09/2004)	Africa	low
Fiji (09/2004) <sup>b</sup>	Western Pacific	upper-middle
Ghana (10/2004)	Africa	lower-middle
India, Chennai State (01/2004)	South-East Asia	lower-middle
India, Haryana State (10/2004)	South-East Asia	lower-middle
India, Karnataka State (11/2004)	South-East Asia	lower-middle
India, Maharashtra State, 12 districts (10/2004)	South-East Asia	lower-middle
India, Maharashtra State, 4 regions (01/2005)	South-East Asia	lower-middle
India, Rajasthan State (06/2003)	South-East Asia	lower-middle
India, West Bengal State (12/2004)	South-East Asia	lower-middle
Indonesia (08/2004)	South-East Asia	lower-middle
Iran (12/2007)	Eastern Mediterranean	lower-middle
Jordan (05/2004)	Eastern Mediterranean	lower-middle
Kazakhstan (11/2004)	European	upper-middle
Kenya (11/2004)	Africa	low
Kuwait (06/2004)	Eastern Mediterranean	high
Kyrgyzstan (02/2005) <sup>b</sup>	European	low
Lebanon (02/2004)	Eastern Mediterranean	upper-middle
Malaysia (10/2004)	Western Pacific	upper-middle
Mali (03/2004)	Africa	low
Mongolia (11/2004)	Western Pacific	lower-middle
Morocco (04/2004)	Eastern Mediterranean	lower-middle
Nicaragua (11/2008)	Americas	lower-middle
Nigeria (09/2006)	Africa	low
Pakistan (07/2004)	Eastern Mediterranean	low
Peru (09/2005)	Americas	lower-middle
Philippines (02/2005)	Western Pacific	lower-middle
São Tomé and Príncipe (06/2008)	Africa	low
South Africa, Gauteng province (11/2004) <sup>b,d</sup>	Africa	upper-middle
Sri Lanka (09/2001) <sup>a,b,c,d</sup>	South-East Asia	lower-middle
Sudan, Gadarif State (02/2006)	Eastern Mediterranean	lower-middle
Sudan, North Kordofan State (02/2006)	Eastern Mediterranean	lower-middle
Sudan, Khartoum State (06/2005)	Eastern Mediterranean	lower-middle
Sudan, Northern State (02/2006)	Eastern Mediterranean	lower-middle
Syrian Arab Republic (12/2003) <sup>b</sup>	Eastern Mediterranean	lower-middle

Country (survey date)	WHO region	World Bank Income Group (2008/09)
Tajikistan (02/2005) <sup>c</sup>	European	low
Thailand (10/2006)	South-East Asia	lower-middle
Tunisia (03/2004)	Eastern Mediterranean	lower-middle
Uganda (04/2004)	Africa	low
Ukraine (09/2007)	European	lower-middle
United Arab Emirates (12/2006)	Eastern Mediterranean	high
United Republic of Tanzania (09/2004)	Africa	low
Uzbekistan (12/2004) <sup>b</sup>	European	low
Yemen (07/2006)	Eastern Mediterranean	low

<sup>a</sup> Pilot studies. Availability data were excluded since they were not assessed using the current WHO/HAI methodology.

<sup>b</sup> Did not survey public sector medicine outlets.

<sup>c</sup> Did not survey public sector procurement prices.

<sup>d</sup> Private sector data on lowest-priced generic medicines excluded since they were not surveyed using the current WHO/HAI methodology.

**Annex 2. Median availability and median price ratio, all surveys**

**a. Public sector, originator brands**

WHO REGION	Survey	Median Availability	25 %ile Availability	75 %ile Availability	Median MPR	25 % MPR	75 % MPR	Minimum MPR	Maximum MPR
AMRO	Bolivia	0.0	0.0	0.0	17.14	17.14	17.14	17.14	17.14
AFRO	Cameroon	0.0	0.0	0.0					
AFRO	Chad	0.0	0.0	0.0					
WPRO	China-Shandong Province	0.0	0.0	15.0	4.09	1.71	7.28	0.98	23.63
WPRO	China-Shanghai	13.3	0.0	40.0	5.64	2.58	10.85	1.28	69.45
AMRO	Colombia <sup>a</sup>	3.3	0.0	3.3					
AMRO	El Salvador	0.0	0.0	1.9					
AFRO	Ethiopia	0.0	0.0	0.0					
AFRO	Ghana	0.0	0.0	0.0	14.91	11.13	40.93	7.35	66.94
SEARO	India	0.0	0.0	0.0					
SEARO	India-Haryana	0.0	0.0	0.0					
SEARO	India-Karnataka	0.0	0.0	0.0					
SEARO	India-Maharashtra 12 districts	0.0	0.0	0.0					
SEARO	India-Maharashtra 4 regions	0.0	0.0	0.0					
SEARO	India-Rajasthan	0.0	0.0	0.0					
SEARO	India-West Bengal	0.0	0.0	0.0					
SEARO	Indonesia	6.7	0.0	13.3	21.80	13.98	36.47	6.15	51.13
EMRO	Iran	13.3	7.5	25.8	6.67	6.66	6.67	6.66	6.67
EMRO	Jordan	0.0	0.0	0.0	5.95	5.95	5.95	5.95	5.95
EURO	Kazakhstan	0.0	0.0	0.0	2.16	1.87	2.45	1.57	2.75
AFRO	Kenya	0.0	0.0	1.9	3.61	3.61	3.61	3.61	3.61
EMRO	Kuwait	12.0	2.0	38.0					
EMRO	Lebanon	0.0	0.0	0.0					
WPRO	Malaysia	0.0	0.0	47.5					
AFRO	Mali	0.0	0.0	0.0					
WPRO	Mongolia	0.0	0.0	0.0					
EMRO	Morocco	0.0	0.0	23.8					
AMRO	Nicaragua	0.0	0.0	0.0					

WHO REGION	Survey	Median Availability	25 %ile Availability	75 %ile Availability	Median MPR	25 % MPR	75 % MPR	Minimum MPR	Maximum MPR
AFRO	Nigeria	0.0	0.0	7.1	7.35	6.04	11.40	2.57	21.48
EMRO	Pakistan	0.0	0.0	0.0					
AMRO	Peru	0.0	0.0	0.0					
WPRO	Philippines	7.7	3.8	18.3	15.31	8.14	32.43	3.11	79.89
AFRO	São Tomé and Príncipe	0.0	0.0	0.0	2.90	2.90	2.90	2.90	2.90
EMRO	Sudan-Gadarif State	0.0	0.0	0.0					
EMRO	Sudan-Khartoum State	0.0	0.0	0.0	3.41	3.41	3.41	3.41	3.41
EMRO	Sudan-North Kordofan State	0.0	0.0	0.0					
EMRO	Sudan-Northern State	0.0	0.0	0.0					
EURO	Tajikistan	0.0	0.0	0.0	49.44	32.12	64.96	4.27	87.39
SEARO	Thailand	10.0	2.5	20.0	4.36	2.03	9.86	1.20	15.82
EMRO	Tunisia	0.0	0.0	8.3		Medicines provided free of charge in the public sector			
AFRO	Uganda	0.0	0.0	0.0					
EURO	Ukraine	50.0	33.3	83.3	9.90	6.58	76.14	1.55	111.68
EMRO	United Arab Emirates	16.7	5.6	22.2		Medicines provided free of charge in the public sector			
AFRO	United Republic of Tanzania	0.0	0.0	0.0					
EMRO	Yemen	0.0	0.0	0.0					

b. Public sector, lowest-priced generics

REGION	Survey	Median Availability	25 %ile Availability	75 %ile Availability	Median MPR	25 % MPR	75 % MPR	Minimum MPR	Maximum MPR
AMRO	Bolivia	31.9	21.7	31.9	3.46	1.84	6.36	0.30	17.55
AFRO	Cameroon	58.3	4.2	77.8	2.16	1.65	2.45	0.06	5.90
AFRO	Chad	31.3	1.0	77.1	3.88	2.63	4.98	1.29	13.16
WPRO	China-Shandong Province	5.0	0.0	20.0	0.93	0.69	2.88	0.23	21.28
WPRO	China-Shanghai	33.3	0.0	66.7	2.03	1.20	4.19	0.34	28.94
AMRO	Colombia <sup>a</sup>	86.7	54.2	96.7	Medicines provided free of charge to insured patients				
AMRO	El Salvador	53.8	3.8	87.5	Medicines provided free of charge in the public sector				
AFRO	Ethiopia	52.9	13.2	80.9	1.33	0.90	1.89	0.19	2.57
AFRO	Ghana	17.9	3.6	46.4	2.43	1.35	5.11	0.88	23.17
SEARO	India-Chennai	50.0	0.0	100	Medicines provided free of charge in the public sector				
SEARO	India-Haryana	8.3	0.0	27.5	Medicines provided free of charge in the public sector				
SEARO	India-Karnataka	14.6	4.2	61.5	Medicines provided free of charge in the public sector				
SEARO	India-Maharashtra 12 districts	15.0	0.0	46.7	Medicines provided free of charge in the public sector				
SEARO	India-Maharashtra 4 regions	15.8	0.0	38.2	Medicines provided free of charge in the public sector				
SEARO	India-Rajasthan	40.0	8.8	100	Medicines provided free of charge in the public sector				
SEARO	India-West Bengal	0.0	0.0	16.3	Medicines provided free of charge in the public sector				
SEARO	Indonesia	46.7	6.7	73.3	2.54	1.73	5.77	0.70	45.85
EMRO	Iran	96.7	90.0	100	1.32	0.94	2.03	0.01	4.89
EMRO	Jordan	27.8	5.6	61.1	0.85	0.57	1.18	0.24	2.64
EURO	Kazakhstan	0.0	0.0	50.0	4.84	2.87	6.36	1.19	22.69
AFRO	Kenya	37.7	5.7	83.0	1.99	1.29	3.33	0.26	13.18
EMRO	Kuwait	12.0	0.0	80.0	Medicines provided free of charge in the public sector				
EMRO	Lebanon	0.0	0.0	10.0	Medicines provided free of charge in the public sector				
WPRO	Malaysia	25.0	0.0	85.0	Medicines provided free of charge in the public sector				
AFRO	Mali	81.0	33.3	90.5	1.83	1.58	2.08	0.99	13.33
WPRO	Mongolia	100	75.0	100	2.60	1.94	4.72	0.79	55.06
EMRO	Morocco	0.0	0.0	72.5	Medicines provided free of charge in the public sector				
AMRO	Nicaragua	50.0	10.0	81.7	Medicines provided free of charge in the public sector				
AFRO	Nigeria	26.2	7.1	45.2	3.50	2.56	6.50	1.92	18.34
EMRO	Pakistan	3.3	0.0	33.3	Medicines provided free of charge in the public sector				

REGION	Survey	Median Availability	25 %ile Availability	75 %ile Availability	Median MPR	25 % MPR	75 % MPR	Minimum MPR	Maximum MPR
AMRO	Peru	61.5	3.8	86.1	1.40	0.84	3.40	0.11	25.12
WPRO	Philippines	15.4	1.0	33.7	6.40	3.25	10.59	1.52	19.49
AFRO	São Tomé and Príncipe	56.3	33.6	78.9	2.36	1.60	3.23	0.09	14.15
EMRO	Sudan-Gadarrif State	40.0	0.0	55.0	3.44	2.41	6.51	0.42	20.13
EMRO	Sudan-Khartoum State	50.0	30.0	95.0	4.78	2.27	7.20	0.89	42.24
EMRO	Sudan-North Kordofan State	64.3	21.4	92.9	4.37	3.13	8.83	1.07	24.15
EMRO	Sudan-Northern State	52.6	15.8	73.7	5.11	2.78	8.25	1.04	19.62
EURO	Tajikistan	75.0	40.0	90.0	2.36	1.45	3.42	0.22	33.50
SEARO	Thailand	75.0	27.5	95.0	2.55	1.45	3.32	0.49	6.79
EMRO	Tunisia	64.3	2.4	95.2	Medicines provided free of charge in the public sector				
AFRO	Uganda	20.0	0.0	65.0	Medicines provided free of charge in the public sector				
EURO	Ukraine	100	66.7	100	3.98	1.95	6.33	0.63	20.72
EMRO	United Arab Emirates	61.1	22.2	94.4	Medicines provided free of charge in the public sector				
AFRO	United Republic of Tanzania	23.4	8.6	54.7	1.33	0.93	2.83	0.29	8.17
EMRO	Yemen	5.0	0.0	12.5	1.09	0.86	1.49	0.64	2.33

c. Private sector, originator brands

REGION	Survey	Median Availability	25 %ile Availability	75 %ile Availability	Median MPR	25 % MPR	75 % MPR	Minimum MPR	Maximum MPR
EURO	Armenia <sup>b</sup>				10.40	5.45	23.60	2.20	95.54
AMRO	Bolivia	0.0	0.0	0.0	30.26	11.91	51.62	5.19	67.35
AMRO	Brazil-Rio de Janeiro State <sup>b</sup>				16.23	11.74	44.98	2.50	81.34
AFRO	Cameroon	52.5	0.0	81.3	16.24	6.80	42.46	1.13	412.92
AFRO	Chad	45.5	11.4	79.5	21.93	11.88	41.50	3.32	113.06
WPRO	China-Shandong Province	0.0	0.0	20.0	7.14	2.35	10.94	0.94	47.16
WPRO	China-Shanghai	10.0	0.0	60.0	8.76	2.75	19.53	1.28	68.42
AMRO	Colombia	40.7	19.5	53.4	17.88	8.76	59.97	0.43	218.32
AMRO	El Salvador	21.2	0.0	41.3	57.92	25.42	105.27	2.94	201.81
AFRO	Ethiopia	0.0	0.0	14.0	11.55	8.60	23.36	2.39	50.02
WPRO	Fiji	23.6	2.8	75.0	9.21	4.67	19.10	1.27	79.01
AFRO	Ghana	3.6	0.0	21.4	15.65	9.34	60.39	2.82	157.03
SEARO	India-Chennai	0.0	0.0	89.4	2.74	1.22	4.50	0.46	12.90
SEARO	India-Haryana	0.0	0.0	35.0	3.55	1.41	6.66	0.44	12.77
SEARO	India-Karnataka	7.5	0.0	54.4	3.84	1.75	7.75	0.51	13.90
SEARO	India-Maharashtra 12 districts	6.7	0.0	58.3	2.78	1.75	5.05	0.46	13.22
SEARO	India-Maharashtra 4 regions	2.1	0.0	41.7	3.77	1.69	5.80	0.49	13.24
SEARO	India-Rajasthan	0.0	0.0	82.5	2.81	1.68	5.26	0.20	13.25
SEARO	India-West Bengal	40.0	2.1	85.7	2.86	1.27	6.59	0.46	17.13
SEARO	Indonesia	25.9	8.6	48.3	22.78	10.75	54.10	1.40	101.96
EMRO	Iran	30.0	12.5	53.3	6.66	4.86	6.67	3.07	6.67
EMRO	Jordan	60.0	55.0	75.0	17.05	10.69	50.70	1.30	159.95
EURO	Kazakhstan	40.0	0.0	77.5	8.58	5.02	26.93	1.37	143.32
AFRO	Kenya	36.2	6.9	58.6	17.75	10.01	57.49	1.07	140.07
EMRO	Kuwait	84.0	28.0	92.0	17.45	9.00	29.34	3.71	110.22
EURO	Kyrgyzstan	0.0	0.0	10.8	5.42	5.08	29.95	1.82	99.11
EMRO	Lebanon	95.0	62.5	97.5	12.87	8.87	28.48	1.48	104.06
WPRO	Malaysia	39.1	2.3	66.4	16.35	4.34	30.91	0.99	111.63
AFRO	Mali	55.0	5.0	65.0	18.14	6.65	29.99	3.49	106.35

REGION	Survey	Median Availability	25 %ile Availability	75 %ile Availability	Median MPR	25 % MPR	75 % MPR	Minimum MPR	Maximum MPR
WPRO	Mongolia	0.0	0.0	0.0	6.40	6.40	6.40	6.40	6.40
EMRO	Morocco	92.5	47.5	100	12.15	8.59	21.65	1.43	215.70
AMRO	Nicaragua	9.7	0.0	30.6	27.52	20.03	64.35	1.72	168.95
AFRO	Nigeria	18.2	2.3	40.9	14.55	6.61	21.11	2.33	50.53
EMRO	Pakistan	54.2	14.6	83.3	3.36	2.20	5.88	0.72	26.20
AMRO	Peru	14.6	6.3	29.9	27.79	14.88	76.14	1.77	180.89
WPRO	Philippines	33.3	15.7	60.8	17.28	10.06	41.55	3.33	184.09
AFRO	São Tomé and Príncipe	0.0	0.0	19.4	53.67	21.81	98.30	2.10	266.70
AFRO	South Africa, Gauteng province	36.7	23.3	59.2	23.49	4.79	70.41	1.09	183.47
SEARO	Sri Lanka <sup>b</sup>				5.13	3.55	6.27	1.46	12.82
EMRO	Sudan-Gadarif State	0.0	0.0	5.0	7.15	5.44	8.85	3.73	10.56
EMRO	Sudan-Khartoum State	0.0	0.0	35.0	18.20	11.08	45.98	3.41	85.43
EMRO	Sudan-North Kordofan State	0.0	0.0	6.7	10.57	7.02	13.28	3.46	15.98
EMRO	Sudan-Northern State	0.0	0.0	5.9	9.95	6.71	15.07	3.56	58.90
EMRO	Syria	0.0	0.0	93.9	9.60	3.94	14.89	2.58	23.71
EURO	Tajikistan	0.0	0.0	5.0	42.58	29.18	55.79	4.94	79.45
SEARO	Thailand	28.6	4.8	71.4	11.60	5.37	23.90	1.48	72.64
EMRO	Tunisia	76.8	3.0	99.4	11.89	4.78	20.91	0.86	43.92
AFRO	Uganda	0.0	0.0	15.0	13.58	7.47	25.64	1.68	118.02
EURO	Ukraine	40.7	25.9	63.0	13.85	5.31	42.78	1.47	101.73
EMRO	United Arab Emirates	100	100	100	23.52	10.62	44.00	1.81	121.90
AFRO	United Republic of Tanzania	0.0	0.0	2.1	18.79	15.45	56.88	12.12	94.98
EURO	Uzbekistan	0.0	0.0	12.5	10.78	2.11	39.80	1.07	127.80
EMRO	Yemen	50.0	17.5	90.0	18.11	7.44	35.60	1.95	129.40

d. Private sector, lowest-priced generics

REGION	Survey	Median Availability	25 %ile Availability	75 %ile Availability	Median MPR	25 % MPR	75 % MPR	Minimum MPR	Maximum MPR
EURO	Armenia <sup>b</sup>				3.42	2.05	5.77	0.48	37.33
AMRO	Bolivia	86.7	60.0	95.8	4.54	2.88	12.32	0.38	52.39
AMRO	Brazil-Rio de Janeiro State <sup>b,c</sup>								
AFRO	Cameroon	52.5	13.8	70.0	13.56	4.51	24.28	0.58	144.23
AFRO	Chad	13.6	0.0	34.1	15.12	14.03	15.96	4.08	26.33
WPRO	China-Shandong Province	5.0	0.0	22.5	0.51	0.29	1.11	0.15	4.13
WPRO	China-Shanghai	15.0	5.0	55.0	1.77	1.27	4.45	0.62	28.94
AMRO	Colombia	87.9	49.6	94.9	3.06	1.50	6.34	0.23	24.61
AMRO	El Salvador	69.2	41.3	89.4	28.33	14.80	52.41	1.56	166.68
AFRO	Ethiopia	88.0	62.0	100	2.15	1.57	3.20	0.29	7.44
WPRO	Fiji	75.0	5.6	93.1	2.73	1.86	3.33	0.31	9.22
AFRO	Ghana	44.6	23.2	66.1	3.83	1.83	6.64	0.39	33.65
SEARO	India	93.8	71.3	99.4	1.54	0.90	3.63	0.06	11.85
SEARO	India-Haryana	61.7	32.5	87.5	1.74	1.11	3.21	0.10	6.30
SEARO	India-Karnataka	68.8	34.4	82.5	1.68	1.22	4.79	0.11	11.03
SEARO	India-Maharashtra 12 districts	74.2	32.9	88.3	1.60	1.24	3.53	0.10	8.98
SEARO	India-Maharashtra 4 regions	57.3	35.9	75.0	1.79	1.25	4.25	0.11	9.46
SEARO	India-Rajasthan	95.0	62.5	100	1.83	1.06	3.56	0.09	10.31
SEARO	India-West Bengal	77.1	42.9	92.1	2.17	1.18	5.29	0.11	9.62
SEARO	Indonesia	62.1	25.9	82.8	2.78	1.92	8.06	0.81	49.43
EMRO	Iran	96.7	93.3	100	1.32	0.95	2.03	0.01	4.89
EMRO	Jordan	80.0	60.0	90.0	10.50	5.67	18.42	0.85	70.14
EURO	Kazakhstan	70.0	17.5	87.5	3.73	1.71	4.61	0.35	72.04
AFRO	Kenya	72.4	51.7	84.5	3.33	1.78	5.08	0.43	20.42
EMRO	Kuwait	0.0	0.0	50.0	15.72	14.05	47.37	4.84	100.05
EURO	Kyrgyzstan	80.0	43.3	94.2	2.56	1.63	4.29	0.48	31.70
EMRO	Lebanon	83.8	21.9	97.5	6.10	4.74	14.87	0.70	44.08
WPRO	Malaysia	43.8	10.2	71.9	6.57	3.02	9.69	1.33	39.27
AFRO	Mali	70.0	40.0	90.0	5.38	3.61	9.96	1.77	34.92
WPRO	Mongolia	80.0	32.0	96.0	4.17	2.54	7.63	0.75	120.13

REGION	Survey	Median Availability	25 %ile Availability	75 %ile Availability	Median MPR	25 % MPR	75 % MPR	Minimum MPR	Maximum MPR
EMRO	Morocco	52.5	0.0	98.8	11.07	5.65	17.09	2.11	82.76
AMRO	Nicaragua	87.1	56.5	93.5	5.73	3.26	9.99	0.69	21.30
AFRO	Nigeria	36.4	13.6	70.5	4.32	3.11	6.73	1.89	42.96
EMRO	Pakistan	31.3	6.3	50.0	2.26	1.15	3.60	0.20	7.02
AMRO	Peru	60.9	10.9	89.3	5.61	2.76	10.69	0.42	40.55
WPRO	Philippines	26.5	4.4	46.6	5.64	3.78	15.17	2.32	26.10
AFRO	São Tomé and Príncipe	22.2	11.1	33.3	13.76	7.31	24.12	0.09	107.51
AFRO	South Africa, Gauteng province <sup>c</sup>	71.7	20.0	86.7	6.52	3.21	13.86	1.58	87.16
SEARO	Sri Lanka <sup>b,c</sup>								
EMRO	Sudan-Gadarif State	55.0	30.0	75.0	4.66	2.81	10.17	0.47	95.11
EMRO	Sudan-Khartoum State	90.0	80.0	100	5.31	3.02	10.43	0.39	93.78
EMRO	Sudan-North Kordofan State	86.7	60.0	100	4.35	2.77	9.45	0.14	99.64
EMRO	Sudan-Northern State	76.5	64.7	88.2	4.57	2.96	9.58	0.40	86.05
EMRO	Syria	98.2	96.5	98.2	2.51	1.56	3.36	0.13	6.47
EURO	Tajikistan	85.0	46.3	95.0	2.29	1.47	3.63	0.25	37.79
SEARO	Thailand	28.6	0.0	92.9	3.31	2.34	5.46	1.15	7.35
EMRO	Tunisia	95.1	0.6	99.4	6.82	2.20	12.02	0.71	31.75
AFRO	Uganda	80.0	50.0	90.0	2.63	1.64	3.43	0.28	16.09
EURO	Ukraine	90.7	74.1	97.2	3.74	2.40	5.32	0.54	12.36
EMRO	United Arab Emirates	73.9	17.4	91.3	13.75	8.24	20.46	1.19	84.47
AFRO	United Republic of Tanzania	47.9	21.9	73.4	2.67	1.84	4.59	0.37	19.00
EURO	Uzbekistan	82.5	57.5	95.0	1.97	1.14	3.59	0.64	66.55
EMRO	Yemen	90.0	70.0	97.5	3.50	1.87	7.45	0.26	18.08

<sup>a</sup> Restricted to reimbursed medicines available through public sector outlets.

<sup>b</sup> Pilot studies. Availability data were excluded since they were not assessed using the current WHO/HAI methodology.

<sup>c</sup> Private sector data on lowest-priced generic medicines excluded since they were not surveyed using the current WHO/HAI methodology.

Source: *Surveys of medicine prices and availability using WHO/HAI standard methodology*. Available from <http://www.haiweb.org/medicineprices/>.

**Annex 3. Ratio of median originator brand price to median lowest-priced generic price for medicines found as both product types, private sector, all surveys**

WHO Region	Survey	No. of medicines found as both product types	Median MPR, originator brands (OB)	Median MPR, lowest-priced generics (LPG)	Ratio Brand: LPG
EURO	Armenia	10	10.40	3.15	3.3
AMRO	Bolivia	4	30.26	13.23	2.3
AFRO	Cameroon	15	32.57	15.46	2.1
AFRO	Chad	5	35.83	14.93	2.4
WPRO	China-Shandong Province	4	6.97	0.29	24.0
WPRO	China-Shanghai	7	9.87	4.29	2.3
AMRO	Colombia	40	19.61	3.03	6.5
AMRO	El Salvador	26	57.92	34.21	1.7
AFRO	Ethiopia	12	11.55	2.04	5.7
WPRO	Fiji	19	9.92	2.86	3.5
AFRO	Ghana	19	15.00	3.88	3.9
SEARO	India-Chennai	15	3.31	2.37	1.4
SEARO	India-Haryana	11	3.55	2.13	1.7
SEARO	India-Karnataka	17	3.84	4.31	0.9
SEARO	India-Maharashtra 12 districts	18	2.78	2.31	1.2
SEARO	India-Maharashtra 4 regions	17	3.77	3.39	1.1
SEARO	India-Rajasthan	16	2.81	2.28	1.2
SEARO	India-West Bengal	21	3.41	3.41	1.0
SEARO	Indonesia	21	25.89	2.75	9.4
EMRO	Iran	3	6.66	0.95	7.0
EMRO	Jordan	24	18.77	9.37	2.0
EURO	Kazakhstan	13	8.51	3.59	2.4
AFRO	Kenya	33	17.93	3.52	5.1
EMRO	Kuwait	11	17.94	15.72	1.1
EURO	Kyrgyzstan	5	5.42	1.51	3.6
EMRO	Lebanon	22	12.87	5.72	2.3
WPRO	Malaysia	28	16.35	6.57	2.5
AFRO	Mali	24	13.38	4.95	2.7
EMRO	Morocco	18	16.25	11.07	1.5
AMRO	Nicaragua	21	27.52	5.82	4.7
AFRO	Nigeria	17	14.63	4.88	3.0
EMRO	Pakistan	20	3.51	2.39	1.5
AMRO	Peru	28	27.79	5.36	5.2
WPRO	Philippines	22	17.64	6.28	2.8
AFRO	São Tomé and Príncipe	17	65.53	13.34	4.9
EMRO	Sudan-Gadarif State	2	7.15	3.07	2.3
EMRO	Sudan-Khartoum State	16	18.20	5.14	3.5
EMRO	Sudan-North Kordofan State	3	10.57	4.26	2.5
EMRO	Sudan-Northern State	7	9.95	4.20	2.4
EMRO	Syria	10	9.60	3.36	2.9
EURO	Tajikistan	4	42.58	3.22	13.2
SEARO	Thailand	15	13.97	3.60	3.9
EMRO	Tunisia	11	12.76	6.99	1.8
AFRO	Uganda	11	13.58	2.61	5.2

WHO Region	Survey	No. of medicines found as both product types	Median MPR, originator brands (OB)	Median MPR, lowest-priced generics (LPG)	Ratio Brand: LPG
EURO	Ukraine	12	13.85	4.20	3.3
EMRO	United Arab Emirates	18	34.87	12.87	2.7
AFRO	United Republic of Tanzania	3	18.79	4.70	4.0
EURO	Uzbekistan	13	10.78	1.76	6.1
EMRO	Yemen	24	19.29	3.96	4.9

Source: Surveys of medicine prices and availability using WHO/HAI standard methodology. Available from <http://www.haiweb.org/medicineprices/>