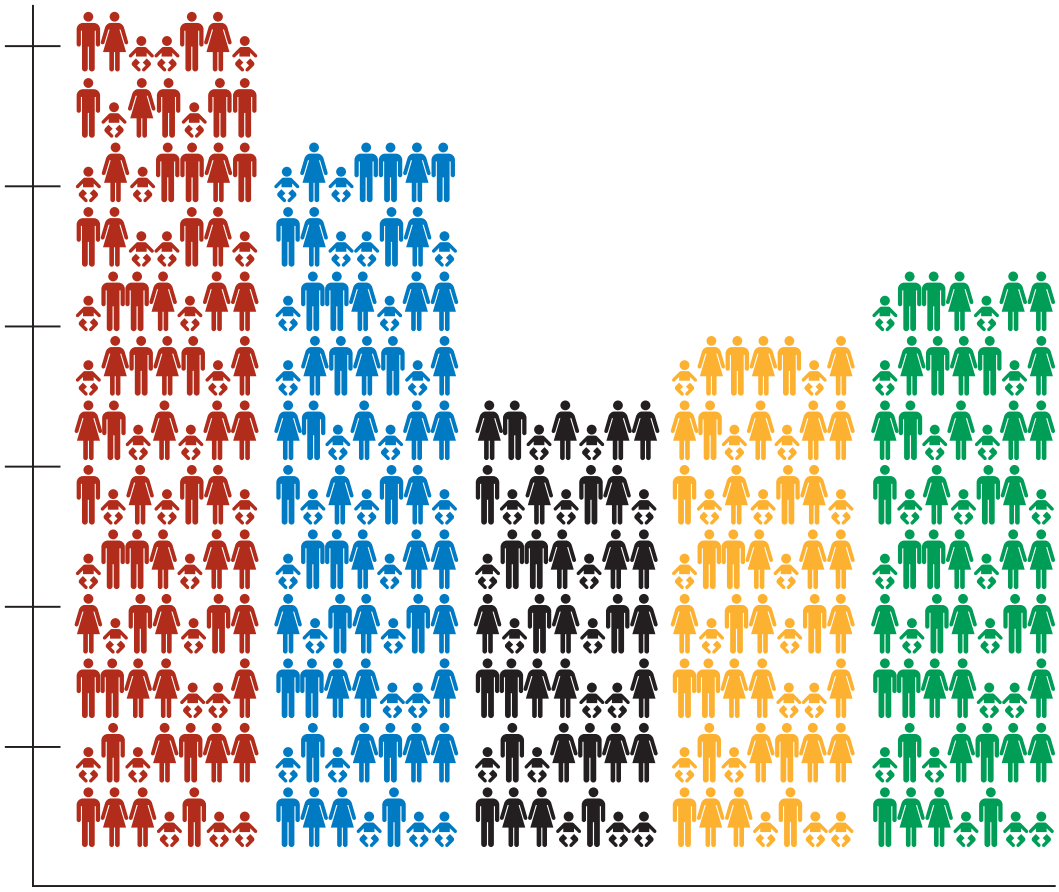

Medicine Prices

a new approach to measurement

2003 edition

Working draft for field testing and revision

World Health Organization Health Action International

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Contents

Preface

In developing countries, most medicines are paid out-of-pocket by individual patients rather than being subsidized through social insurance. High prices are a major barrier to the use of medicines and better health, yet too little is known about the prices that people pay for medicines in low- and middle-income countries.

This manual and the accompanying Workbook and database provide a new approach to measuring the prices of medicines. They result from the widely-felt need for greater transparency on prices in the global medicines marketplace. The work proposed can be carried out reliably and at low cost by consumer groups, academic centres concerned with public health, government departments or others.

The survey is focused on thirty key medicines covering the spectrum of the global disease burden, particularly as it falls on low- and middle-income countries. The results should raise questions about the relative prices of innovator brand medicines and their generic equivalents, about prices in different parts of the same country, about the relationship between procurement prices and final prices to patients, about the affordability of treatment for ordinary people and about international differences in prices for the same medicines.

The manual is the outcome of a technical project of the World Health Organization (WHO)/Public Interest Nongovernmental Organizations Roundtable on Pharmaceuticals, which was established in 1998 to strengthen collaboration between WHO and civil society. Public interest nongovernmental organization (NGO) participation is drawn from consumer, development, emergency relief, non-profit medicine supply and professional organizations. NGO coordination of the Roundtable and of this project is undertaken by Health Action International (HAI) Europe.*

After reviewing experiences of monitoring the prices of medicines, Roundtable participants identified the need for the development of a standardized method for the collection and analysis of medicine prices and price composition within a country at a specific point in time and over time.

During 2001 and 2002, project members field tested the manual in nine countries and four continents – in Armenia, Brazil, Cameroon, Ghana, Kenya, Peru, Philippines, South Africa and Sri Lanka. Progress in the work was assisted by a panel of highly experienced and widely recognized experts.

The outcome is the new approach, described in this manual, to measuring the prices people have to pay for a selection of important medicines across local sectors (public, private retail pharmacies and other medicine outlets). The manual also outlines how to collect information on price composition, such as taxes,

* Health Action International (HAI) is an independent, international network of groups and individuals who believe that policies and health care systems should meet people's needs. HAI seeks to influence international and national policies and regulations to ensure that they protect and promote public health. HAI's focus is on the promotion of the essential drugs concept, equitable access to quality medicines and the rational use of drugs.

mark-ups and fees, and assess the affordability and availability of medicines. To facilitate data analysis, a software application for Microsoft Excel has been designed to accompany this manual; this is provided on the CD-ROM in the inside front cover.

The methodology has been designed primarily for use in low- and middle-income countries, but should be applicable to all countries. All users are encouraged to submit the results to the WHO Essential Drugs and Medicines Policy Department (WHO/EDM) and Health Action International Europe so that they can be lodged on the database that is specific to this initiative. This is accessible on HAI's website (www.haiweb.org/medicineprices). The establishment of this database is an important step towards greater transparency and availability of reliable information on medicine prices in different settings.

Despite the considerable expertise and field testing that went into developing this manual, WHO and Health Action International consider this first edition as a starting point. The methodology will be kept under review with accumulating experience and will be further developed as more surveys are undertaken.

Please contact the WHO Essential Drugs and Medicines Policy Department or Health Action International Europe if you are contemplating undertaking a survey of medicine prices. Please also contact us if you have any queries or comments, particularly on aspects of the methodology that are unclear or prove to be difficult to implement. This is key to improving the methodology and, in turn, improving the transparency of information on medicine prices.

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NGO members of the Roundtable are deeply indebted to Daphne Fresle, without whose support and encouragement this medicine pricing project, and indeed the Roundtable itself, may not have been realized.

Abbreviations and acronyms

ARV	Antiretroviral
BNF	British National Formulary
CIF	Cost, insurance and freight
EML	Essential medicines list
FOB	Free on board
HAI	Health Action International
HAART	Highly Active AntiRetroviral Therapy
IRP	International reference price
LPG	Lowest price generic equivalent
MPR	Median price ratio
MSG	Most sold generic equivalent
MSH	Management Sciences for Health
MSP	Manufacturer's selling price
MUP	Manufacturer's unit price
NA	Not available
NGO	Nongovernmental organization
OECD	Organization for Economic Co-operation and Development
PBS	Pharmaceuticals Benefit Scheme (Australia)
SMUP	Sector median unit price
TRIPS	Trade-Related Aspects of International Property Rights
WHA	World Health Assembly
WHO	World Health Organization
WHOEML	WHO Model List of Essential Medicines
WTO	World Trade Organization

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Why measure the price of medicines?

- One-third of the world's population lacks reliable access to the medicines they need primarily because they cannot afford to purchase them
- Little is known about the prices that people pay for medicines and how these prices are set
- Reliable information on the prices of medicine is needed in order that more favourable purchasing agreements can be negotiated, domestic distribution better managed and pricing policies monitored
- This manual offers a new approach to the measurement and monitoring of medicine prices
- The methodology described in the manual is designed to assist governments, nongovernmental organizations, international agencies, health professionals and consumers in advocating for more equitable access to essential medicines.

MEDICINE PRICES AND INEQUITIES IN HEALTH

One-third of the global population lacks reliable access to needed medicines, according to estimates by the World Health Organization (WHO, 2000). The situation is worse in the poorest countries of Africa and Asia where up to 50% of the population are unable to obtain necessary medicines (WHO/WTO, 2001).

Up to 90% of the population in developing countries have to buy medicines through out-of-pocket payments as opposed to around 20% in high income countries (WHO/WTO, 2001). Less than 10% of the population of Africa is protected by social insurance and publicly subsidized health services are both inadequate and located primarily in and around principal urban centres.

Many direct and indirect pharmaceutical price regulations remain in effect in OECD countries (Jacobzone, 2000). In many developing countries, however, national medicine pricing policies are shifting from price controls to deregulation under the influence of structural adjustment and reform programmes. It is not yet clear how market forces affect medicine prices in this new environment. In the short term, at least, they may increase costs for which policy adjustments may be required.

Duties, taxes, mark-ups, distribution costs and dispensing fees are often high, regularly constituting between 30% and 45% of retail prices, but occasionally up to 80% or more of the total (Bale, 2001; European Commission, 2003; Levison, 2003). Prices are also influenced by whether the country observes patents, the level of domestic production of medicines, a lack of competition between pharmaceutical manufacturers and weak or non-existent price controls.

Examples of inequalities in access to medicines

- A full course of antibiotics to cure simple pneumonia in a low-income country can cost one month's wages for the lowest paid unskilled government worker compared with two to three hours' wages in a high-income country (WHO, 2000)
- To pay for one course of tuberculosis treatment in the private sector, a Tanzanian would have to work for 500 hours in comparison with a Swiss who would have to work only 1.4 hours (WHO, 2001)
- In 2000, lamivudine, used in the treatment of HIV/AIDS, was found on average to be 20% more expensive in real terms in Africa than in ten advanced industrialized countries (Pérez-Casas, 2000).

WHY MONITOR THE PRICES OF MEDICINES?

Medicines are not only unaffordable for large sectors of the global population, but are also a major burden on government budgets. In high-income countries, governments spend about 10% of their health budgets on medicines, while in low-income countries, medicines account for 25% of government health budgets. In most high-income countries, insurance covers the major part of medicine costs to the patient but, in Africa and South Asia, surveys show that medicine costs can dominate households' health spending, at over 80% of the total. With shrinking incomes and increased inequity, national policies and medicine pricing and procurement strategies are required to ensure that medicines are affordable. Policies are also needed to improve health infrastructures, improve financing and ensure the rational use of medicines. But the price of medicines is one of the most important obstacles to access. Equitable pricing – selling the same medicines at different prices in different countries in accordance with people's purchasing power – is infrequently implemented by pharmaceutical companies. Changes in trade regulations and particularly rules relating to intellectual property, such as patent rights, may also affect the international prices and availability of medicines (WHO, 1999). Prices thus need to be monitored. The approach outlined in this manual offers a basis for monitoring prices across medicines, sectors and countries as well as over time, and its future development is being closely coordinated with a WHO project concerned specifically with globalization, TRIPS and access to medicines (WHO, 2002).

The difficulty in finding reliable information on medicine prices, and therefore in analysing their components, hinders governments from constructing sound medicine pricing policies or evaluating their impact. It also makes it difficult for governments to evaluate whether their expenditure on medicines is comparable to that of other countries at a similar stage of development and those responsible for purchasing medicines cannot negotiate cheaper deals because they have no sound basis from which to start their negotiation. Even in countries where

consumers and patients have greater purchasing power, governments, insurance funds and hospitals often find it difficult to make decisions on the selection of medicines because of a lack of information.

It is, of course, the responsibility of governments to ensure that the health care needs of their populations are met through adequate funding of public sector health care delivery systems. In many cases, this would mean substantially enhancing the health budget. Steps can be taken to bring medicines within the financial reach of low-income populations and prevent unnecessary disease and death, but much more information is needed about medicine prices than is known at present.

Some commonly used medicines have been found to be more expensive in developing countries than in industrialized countries. The ex-manufacturer price to countries may be confidential. Medicine price indicator guides (Management Sciences for Health; WHO-AFRO; UNICEF/UNAIDS/WHO-HTP/MSF) show the sales prices from large wholesalers of generically equivalent medicines, but do not give the price patients have to pay and often do not include new, essential but patented medicines. The monitoring of prices and cross-country comparisons are therefore important.

THE NEED FOR A STANDARD APPROACH TO MEASURING MEDICINE PRICES

If medicines are to be affordable, an appropriate and well-informed medicine pricing policy is required. This, in turn, requires a reliable analysis of medicine prices. The methodology to measure medicine prices in low- and middle-income countries, described in this manual, is a step in this direction.

Since 1999 the World Health Assembly has made a number of resolutions that address medicine prices (WHO, 2000). Impetus to the discussion has also been provided by the potential impact of the World Trade Organization (WTO) agreement on Trade Related Aspects of International Property Rights (TRIPS) in 1998 which requires stronger and prolonged patent protection of pharmaceuticals, resulting in high prices for a longer period of time.

While medicine prices have been monitored and reported in a number of countries, with varying objectives and success, the absence of a standard methodology has been a stumbling block in reliable monitoring and comparisons of prices within and between countries and over time. Without reliable data, advocacy to promote more equitable access to medicines will be ineffective.

This manual and the accompanying software application aim to build on the strengths of earlier work by providing a methodology for measuring medicine prices that avoids the limitations of previous approaches.

The methodology is intended to be a useful tool for:

- Governments:
  - When monitoring the impact of policies relating to medicine pricing and medicine tariffs, the impact of generic competition, local production and the effects of patent protection
  - When purchasing medicines and negotiating for equitable medicine prices based on ability to pay (known as “differential” or “equity” pricing)

- NGOs, health professionals and consumers in identifying factors of inequity and unaffordability when advocating for equitable access to essential medicines
- Governments and NGOs when measuring the affordability and availability of essential medicines globally, within countries, in different segments of the health care sector and over time
- Development agencies and researchers when assessing the effects of policies on programmes.

A NEW APPROACH

The approach described in this manual has been designed for the collection and analysis of medicine prices in a standardized way. It has been developed for use by governments, nongovernmental organizations, international agencies, researchers, health professionals and consumer organizations.

This new approach involves a systematic survey to collect accurate data and reliable information on a selected number of medicines; it is characterized as follows:

- Standard list of medicines for comparison
- Systematic sampling process
- Use of international reference prices
- Comparison of innovator brand and generically equivalent medicines
- Sector comparisons: e.g. public, private for-profit, private not-for-profit
- Affordability comparisons
- Identification of the components making up the final price.

A completed study using this approach enables the following questions to be answered:

- What price do people pay for key medicines?
- Do the prices and availability of the same medicines vary in different sectors: public health facilities, private retail pharmacies and other medicine outlets?
- Do prices of the same medicines vary in different parts of a country?
- What is the difference in prices of innovator brands and generically equivalent medicines?
- How do procurement prices compare with international reference prices and with local retail prices?
- What taxes and duties are levied on medicines and what is the level of various mark-ups, which contribute to their retail prices?
- How affordable are medicines for ordinary people?

A medicine price study using this methodology will enable the price of a medicine to be followed from the point at which it leaves the manufacturer to the time it reaches the consumer's hands. It focuses on a limited number of medicines and enables their prices to be investigated across health care sectors within individual countries and also between countries. It is designed to measure medicine prices at a certain point in time, but can also be used to monitor them over a period of time. The methodology facilitates rapid and reliable data collection and should be easily replicable.

The methodology requires a systematic survey of the prices of a core list of medicines and allows for a supplementary list of medicines that are selected by each country on the basis of their importance in treating major national health problems. Data analysis, using the software application on the CD-ROM accompanying this manual, will generate the following information:

- The prices of selected medicines in different sectors, geographical areas, health facilities and pharmacies
- The components of medicine prices
- The affordability of the medicines
- The availability of the medicines.

A database of results has been created by HAI. Each country undertaking a survey using this methodology is encouraged to send the results to HAI Europe and WHO/EDM so they can be shared with other countries; this will enable international price comparisons to be made and increase transparency in medicine pricing.

These tools alone will not, of course, solve the problem of high medicine prices. The studies proposed are small in scale and cover only a handful of medicines. The findings of these surveys will, in most cases, serve to define the price problem rather than to solve the challenge of making medicines affordable. That task demands the engagement of many actors and resources beyond these small-scale explorations. But work based on these tools should provide a systematic and reliable set of basic data which will become increasingly widespread. Such data provide reliable evidence for advocacy. Defining the problem is the first step on the road to tackling high medicine prices.

CONTENTS OF THE MANUAL

The remainder of the manual contains the following chapters.

Chapter 2: Overview of the survey introduces the survey methodology and the data that will be collected.

Chapter 3: Planning outlines the steps involved in conducting a medicine price survey, considers the human, technical and financial resources that will be required and explains the sampling process.

Chapter 4: Data collection at central level provides guidance on adapting and completing the forms used for data collection at central level (the National Pharmaceutical Sector form and the Medicine Price Data Collection form) and collecting data on price components.

Chapter 5: Preparation for data collection in the field focuses on planning and preparation for field work, including sampling sites, the selection and training of data collectors, pilot testing and the finalization of the Medicine Price Data Collection form used to collect price data from health facilities and pharmacies.

Chapter 6: Data collection in the field provides guidance for area supervisors and data collectors on the data collection process and completing the Medicine Price Data Collection form.

Chapter 7: Data entry describes how to enter data from the field into the computerized *Workbook* accompanying this manual.

Chapter 8: Data analysis and interpretation explains how to generate and present summary results for each medicine in each sector included in the survey and to analyse treatment affordability, availability and price composition.

Chapter 9 : International price comparisons describes how survey data from individual countries can be used to make cross-country comparisons of the prices and affordability of medicines.

Chapter 10 : Exploring possible policy options and lines of action discusses how data collected in the survey can be used to develop appropriate strategies to influence the price and availability of medicines.

Chapter 11: Reporting provides guidance on reporting the findings of the survey and suggests different forms in which the results can be presented in order to achieve the most effective dissemination to different target audiences. An example of a report is included in Annex 5.

Chapter 12: Development of the manual and beyond outlines how the manual will be developed following the completion and evaluation of further surveys. The next phase of the project is also outlined.

The manual also contains:

- Glossary of terms
- References.

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Overview of the survey

- This survey has been designed to provide a comprehensive picture of the prices of selected medicines in your country
- You should follow the methodology in order to ensure that your data are reliable and that international comparisons are possible
- This chapter outlines the key steps in the process which are discussed in detail in subsequent chapters
- A computerized *Workbook* is provided for data processing
- The survey should be repeated periodically in order to assess the impact of policy changes on the prices of medicines.

If you, the commissioning organization (NGO, government, public health researcher, etc.), are considering a medicine price survey, spend some time clarifying and drafting the objectives. Be very clear about who you will direct the results and recommended actions to and who else could work with you to achieve the objectives. You will need to designate a survey manager. Most of this manual is addressed to the survey manager. However, we recommend that the commissioning organization should be thoroughly familiar with the survey procedures.

STEPS IN THE SURVEY

The survey of medicine prices involves the following steps.

1 Survey planning and preparation.

2 Gathering baseline information on the national pharmaceutical sector.

3 Identifying sectors for price comparisons.

4 Selecting geographical areas, health facilities, pharmacies and other medicine outlets in the chosen sectors for sampling.

5 Finalizing the selection of medicines for inclusion in the survey.

6 Training of data collectors and data entry personnel.

7 Collecting data on the prices and availability of medicines in the chosen health facilities and pharmacies.

8 Identifying the components of medicine prices.

9 Assessing affordability.

10 Data entry and processing.

11 Data analysis and interpretation.

12 Making international price comparisons.

13 Identifying policy options.

14 Reporting the survey findings and advocacy.

15 Repeating the survey.

All of these are discussed in detail in the following chapters.

SURVEY PLANNING AND PREPARATION

Careful planning and preparation are essential before data collection commences, including:

- Selecting survey personnel: the survey manager, area supervisors, data collectors, data entry personnel and data analyst and the appointment of an Advisory Group
- Securing the technical and financial resources required
- Selecting sectors and geographical areas for inclusion in the survey
- Sampling health facilities, retail pharmacies and other medicine outlets
- Preparing a survey schedule
- Seeking endorsement for the survey.

Note: those undertaking a survey should periodically check the HAI website. Updates, clarifications, tips from survey managers, examples of advocacy documents, etc. will be added to the site as surveys and advocacy are undertaken.

COLLECTING NATIONAL PHARMACEUTICAL SECTOR DATA

The health care system and the organization of the pharmaceutical sector vary widely between countries. Before beginning the survey, it is important to have a clear understanding of how pharmaceutical services are organized and to determine the relative contribution of various sectors to the procurement and distribution of medicines. Additionally, the main distribution channels for pharmaceuticals should be clearly identified. This will enable you to put medicine prices in a country-wide context and will permit the identification of countries with similar pharmaceutical characteristics, enabling a useful comparison to be made. These data will enable you to take into account the relative importance of different market segments and different financing arrangements, such as social insurance, in making internal and international price comparisons. Check with the Ministry of Health, National Statistical Office or WHO office whether a recent survey has been undertaken for a national medicines policy review.

IDENTIFYING SECTORS

The survey measures medicine prices at procurement and in three sectors, as follows:

- Public sector: government, municipality or other local authority health facilities, including:

  - Clinics and hospitals
  - Health centres
  - Pharmacies
  - Central and/or regional medical stores
- Private sector, including retail pharmacies and pharmacies in private clinics and hospitals; *note that health facilities operated by private companies, such as mining companies, are excluded*
- "Other" sector, which you may define according to local circumstances, such as:
  - Health facilities run by nongovernmental organizations (NGOs) including religious organizations, such as church missions, charitable organizations and relief and development agencies
  - Dispensing doctors
  - Other non-pharmacy private medicine outlets.

Some of these facilities and sectors may not exist in your country.

SAMPLING

Data need to be collected in a systematic way in order to ensure that the findings are representative of the country or region in which the survey is being conducted. It is usually not feasible to collect data from a large number of health facilities, pharmacies and other medicine outlets, so a small sample of facilities should be selected in at least four geographical areas: the main urban centre and three other administrative areas. Once these areas have been selected, a sample of facilities and medicine outlets should be chosen for data collection. The sample usually includes facilities in the public, private and "other" sectors.

SELECTING MEDICINES

Many different medicines are registered and available. A national essential medicines list, which is often only applied in the public sector, normally contains between 250 and 500 substances. In the private sector, however, several thousand medicines may be available.

In order to make the survey manageable and to enable comparability, a short "core" list of 30 medicines has been selected as the basis for data collection and analysis. For each medicine, the core list contains one dosage form, one strength, one recommended pack size and up to three products to measure: the innovator brand, the most sold generic equivalent and the lowest price generic equivalent.

Core list of medicines

It is important to use the core list of medicines as the basis for the survey as this will enable you to compare your prices with those in other countries, where they are available. The 30 medicines contained in the core list have been selected because they meet the following criteria:

- Global burden of disease: they are all used to treat common conditions, acute and chronic, that cause significant morbidity and mortality, including

cardiovascular diseases, diabetes, asthma, respiratory tract infections and mental health

- Availability: they are available in standard formulations and are widely used in many countries
- Importance: the majority are included in the WHO Model List of Essential Medicines (WHOEML)
- Patent status: they represent medicines that are both new and on patent, and older medicines that are off patent. In some instances, both new and older products for the treatment of the same condition have been included.

Supplementary list of medicines

In addition to surveying the prices of medicines included on the core list, you may wish to select up to twenty additional medicines that are commonly used in the treatment of important national health problems, particularly if some medicines on the core list are not available in your country. The supplementary list could also include medicines that are pharmaceutically equivalent to ones on the core list but that are more frequently used in your country, such as another ACE-inhibitor, antidiabetic or antacid medicine.

International reference prices

Reference prices are used to facilitate national and international comparisons. Summary measures of the medicine prices found during the survey will be expressed as ratios relative to a standard set of reference prices. The Management Sciences for Health (MSH) reference prices have been selected as the most useful standard. The MSH reference prices are the medians of recent procurement or tender prices offered by not-for-profit suppliers to developing countries for multi-source products.

TRAINING

All personnel involved in data collection and data entry require training to ensure the reliable and accurate completion of the data collection forms and their transfer to the *Workbook*. It is recommended that a pilot test should be conducted during the training of data collectors.

COLLECTING DATA ON THE PRICES AND AVAILABILITY OF MEDICINES

The prices of medicines vary according to a number of factors, including:

- The sector in which they are purchased: the price is often higher in the private for-profit sector
- The type of procurement agent: for example, different prices may be paid for the same product by a public sector purchaser, such as the Ministry of Health, the health facility that supplies the medicine to the patient, and the individual who purchases the medicine
- The distribution route: a patient who purchases a medicine at a public hospital pharmacy, for instance, may have to pay more if the hospital

pharmacy purchased the product from a local wholesaler than if it has been purchased by tender and supplied through the public health sector distribution system

- The patent status: the price of patented medicines is often higher than that of their generic equivalent, at least while the patent is in force.

If a medicine is under patent in a given country, only the innovator brand or a licensed product will be on the market, unless measures are taken to allow the penetration of generically equivalent products. If it is off patent, a number of generically equivalent products are likely to be available. For each medicine, data collectors are asked to record three prices on the Medicine Price Data Collection form in each health facility and pharmacy included in the sample:

- The innovator brand
- The most sold generic equivalent in your country
- The lowest price generic equivalent in the medicine outlets surveyed.

The methodology also measures the availability of the selected medicines. The medicines included in the core list may not be the most frequently used in your country and may not even be on your essential medicines list. In most cases, there are pharmaceutically equivalent medicines that you may have chosen to include on your supplementary list. The estimate of availability may therefore be more accurate for the supplementary list. For both lists, however, it does provide an indication of where action may be required.

IDENTIFYING THE COMPONENTS OF MEDICINE PRICES

The final price of a medicine paid by a government facility, a health insurer or the patient reflects the manufacturer's selling price (MSP), plus all intervening price additions. These add-ons to the producer's price are known as "price components" and represent the cost of importation, distribution and dispensing. They consist of local costs that may differ substantially from one country to another, within a sector and even between medicines. They typically include:

- Pharmaceutical import duties
- Taxes
- Mark-ups by importers, wholesalers and retail distributors
- Distribution costs
- Dispensing fees.

ASSESSING AFFORDABILITY

One of the best ways of illustrating the impact of medicine prices on the cost of health care for individual patients and society is to compare the cost of treatment with peoples' income. For this survey, the daily wage of an unskilled government worker is used for comparison. When price data are entered in the computerized *Workbook*, the affordability of treatment for a selection of conditions will be calculated automatically. This will enable you to identify the number of days an unskilled government worker would have to work in order to afford the cost of a defined course of treatment for these conditions.

DATA ENTRY

Data entry and analysis generally take place at central level. A computerized *WHO/HAI International Medicine Price Workbook*, which is a special application for Microsoft Excel, is used to enter the data collected in the field, consolidate and summarize results and print tables that serve as the basis for reports. The *Workbook*, which is provided on the CD-ROM accompanying this manual, allows rapid entry and analysis of data on the price and availability of medicines and facilitates international price comparisons.

DATA ANALYSIS AND INTERPRETATION

The *Workbook* also provides automatic summaries of data to permit four types of data analysis:

- Price and availability comparisons within any one sector
- Price and availability comparisons between different sectors
- Treatment affordability
- Price composition.

The *Workbook* automatically generates summary tables which compare the median prices from your survey with international reference prices and which provide the evidence base for your report.

MAKING INTERNATIONAL PRICE COMPARISONS

Comparisons of medicine prices with those in other countries can provide powerful tools for advocacy and help to identify policy changes and possible lines of action to reduce high prices. HAI has established a database on its website so that price data collected using this methodology are accessible to all. All countries undertaking a survey of medicine prices are encouraged to send the completed *Workbook* and survey report for inclusion on this database to enable international comparisons to be made of:

- The prices of individual innovator brand or generically equivalent medicines, from each defined sector, on the core list
- The affordability of selected courses of treatment, measured against the minimum wage for a government worker
- The price composition of a medicine.

IDENTIFYING POLICY OPTIONS

The ultimate objective of the price survey is to bring about changes in national medicines policies which will result in making medicines affordable for all people. High medicine prices may be attributable to a number of factors; accordingly, an understanding of the most important contributing causes is needed in order to advocate for the most appropriate policy options and lines of action.

REPORTING THE SURVEY FINDINGS

Reliable data and the accurate analysis and interpretation of data form the foundation of the survey, but its effectiveness in stimulating policy changes to reduce the price of medicines will, in part, be determined by the way in which the findings are presented and the advocacy that follows.

The findings of the survey can be presented in a number of formats. To achieve the maximum coverage and impact, they should be reported in the most appropriate form for the various target audiences. An example of a survey report is included as Annex 5. The survey report should be prepared and disseminated as quickly as possible to avoid the findings becoming outdated.

REPEATING THE SURVEY

The prices of medicines do not remain static and need to be monitored at regular intervals. In addition, the findings from one survey could lead to changes in policy that should be monitored. The survey should, therefore, be repeated regularly, preferably every one or two years. It is important to survey the same medicines at the same sites as in the original survey in order to measure any changes in prices as accurately as possible. You should also identify the price components that have changed and determine further action that might be taken to reduce the prices paid.

You may also want to include new products in a repeat survey. These should be added to your supplementary list of medicines. Alternatively you may wish to delete others if they are no longer widely available or commonly prescribed.

When surveys are repeated, external conditions such as inflation may influence price stability and make comparison difficult. You may have to discuss their impact with economists and get advice on how to adjust for these conditions.

3

Planning

- Identify the personnel, technical and financial resources required to conduct the survey before starting data collection and data processing
- It is essential to follow the survey design and process, particularly in relation to the sampling technique
- The survey should take between six and eight weeks to complete, including data collection, data entry, data analysis and report writing
- An official letter of endorsement from the Ministry of Health and/or the Pharmacy Association will facilitate data collection.

PERSONNEL

The survey will require the involvement of the following personnel:

- Survey manager, supported by an Advisory Group
- Area supervisors
- Data collectors
- Data entry personnel
- Data analyst.

Survey manager

A survey manager should be designated to plan and coordinate the survey at national level. For NGOs, this role will usually also include fundraising and advocacy.

Wherever possible, the survey manager should be a pharmacist with some experience in conducting surveys. A familiarity with Microsoft Excel spreadsheets, basic statistics (such as ratios, medians and percentiles) and interpreting data is highly desirable. Successful communication of the survey results also requires an understanding of the policy-making process and advocacy strategies. Where the survey manager does not possess all these qualities, he or she should select the Advisory Group members to ensure that the survey management team includes pharmacy, survey, statistics, policy and advocacy skills.

Advisory Group

A group of carefully selected advisers should be useful in helping to plan and support the survey and promote its findings. The membership should complement

the survey manager's skills in the areas above and include at least one medical doctor as well as stakeholders, such as policy makers, health care providers, relevant professional associations, public health institutions, academic institutions and consumer organizations. It may be wise to include the data analyst and an area supervisor to ensure that the Advisory Group understands local realities.

The role of the Advisory Group will include:

- Determining the specific focus of the survey: i.e. national or regional
- Identifying the sectors to be surveyed
- Supporting the survey manager in setting up and conducting the study
- Advising on any matters that arise during survey preparation, data collection and data analysis, including how to solve any problems that may be encountered
- Assisting in preparing the survey report and making recommendations on policy options and possible lines of action
- Promoting the findings of the survey and advocating appropriate changes in policy.

Area supervisors

In a small country or in a survey that is conducted in a single region of the country, it may be possible for all field work to be undertaken by a central team. Experience from conducting pilot studies has shown that in larger-scale studies, however, it is advisable to designate a supervisor, preferably a pharmacist, in each of the geographical areas that will be surveyed.

Area supervisors should be experienced in data collection and be familiar with pharmaceutical terminology. They will be instrumental in gaining access to facilities and in choosing local data collectors, if they are not sent from central level. If any area supervisor is unfamiliar with their designated area, a local contact may be needed to assist in identifying facilities and pharmacies.

Data collectors

Wherever possible, data collectors should:

- Have previous experience of conducting surveys
- Have some pharmaceutical training
- Be familiar with the locality.

Ideally, data collectors should work in pairs so that they can make systematic checks of entries in the Medicine Price Data Collection form. Each visit to a health facility or pharmacy is likely to require about 1–2 hours plus transport time. In practice, this means that a team of two data collectors can probably survey two to four facilities per day.

Data entry personnel

Accurate data entry is vital to ensure the reliability of the results. Two data processing personnel with experience in using Microsoft Excel are required: one to enter the data and the other to re-enter the same data to check that the entries are correct. The computerized *Workbook* has been designed to identify any discrepancies in data entry using this "double-entry" process.

Data analyst

Data analysis requires an understanding of the pharmaceutical sector and experience in computer use and the interpretation of statistics. Where possible, data analysis should be undertaken by the survey manager.

TECHNICAL RESOURCES

The computerized *Workbook* is a specially designed software application for Microsoft Excel. In order to use it, a computer that meets the following minimum requirements will be needed:

- An IBM-compatible PC with a Pentium 3 or higher processor
- Windows operating environment
- 48 megabytes of system memory
- Microsoft Excel Office 97 or later version
- A CD drive or internet access, so that the *Workbook* can be loaded from the CD-ROM supplied with the manual or downloaded from the HAI website.

Very few other resources are needed to conduct the survey. Each area supervisor should be supplied with a simple calculator to calculate unit prices.

Transport will be needed to take the data collection teams to health facilities and pharmacies, and to the geographical sites selected, if the teams are not from the local area.

FINANCIAL RESOURCES

When planning the survey, reporting and advocacy, it is essential to ensure that there is an adequate budget for the following items:

- Personnel:
  - Survey manager
  - Area supervisors
  - Data collectors
  - Data processing personnel
  - Data analyst
- Training:
  - Training venue
  - Daily allowance and accommodation
  - Transport
  - Materials
- Data collection:
  - Daily field allowance and accommodation for data collectors
  - Transport
  - Materials: pens, calculators
  - Photocopying
- Advocacy: for example, meetings, seminars, briefing materials
- Communications
- Overhead
- Contingency.

PLANNING WHERE TO CONDUCT THE SURVEY

Defining the type of survey

Most medicine price surveys will involve examining prices and price variations in an entire country or in a large region of a country. However, the methodology can be adapted for different purposes such as to contrast prices in two geographic areas or to monitor changes in prices in a sample of medicine outlets over time.

The ideal national survey would collect data from a large number of health facilities and other medicine outlets scattered around the country. However this would require a great deal of time and resources. To make the survey feasible, therefore, it is based on small samples of geographic areas and medicine outlets. Through careful selection, these study sites can adequately represent the situation in the country as a whole.

If resources allow, increasing the numbers of geographic areas and medicine outlets above the minimum numbers recommended below will increase the accuracy of the survey. If you plan to increase the number of facilities surveyed, increasing the number of geographic areas will provide a more representative sample than simply increasing the number of medicine outlets surveyed in the same geographic areas.

Selecting sectors

One key issue for the study planning team to decide is how many sectors to include in the survey. Each sector represents a conceptually different source of medicines or prices to be assessed and compared.

Most national surveys will examine at least three of the following four sectors.

1. Medicine Procurement Prices: prices that the government and other purchasers pay to procure medicines.

2. Public Sector Patient Prices: if patients in public health facilities are charged for medicines, these prices may be considered a second sector, which can be compared to procurement prices. Even if medicines are free in public facilities, most surveys will want to examine the availability of the target medicines in the public sector.

3. Private Sector Retail Prices: prices that patients pay in private pharmacies.

4. Other Sector Patient Prices: depending on the nature of the pharmaceutical sector, there may be a fourth, "other" sector you may wish to include in the survey. Examples include:
   - Health facilities run by church missions or other nongovernmental organizations, such as charitable organizations or relief and development agencies
   - Dispensing doctors
   - Other non-pharmacy private retail outlets that stock a reasonable range of products.

The computerized *Workbook* is designed to measure prices in up to four sectors.

Choosing study areas

Once a decision has been made on the number of sectors to be included, you will need to determine where to collect data.

Procurement data can usually be collected centrally from the office of the procurement officer or central medical stores.

Data on prices and availability in the public, private and "other" sectors are obtained by data collectors in the field.

Collecting data in many areas increases the cost and complexity of a survey but, if prices vary widely by area, sampling too few will bias results. Include **at least four geographic areas in a national or regional survey**, as follows:

- Select the major urban centre (usually the capital)
- Select three other administrative areas (e.g. districts, municipalities, counties) chosen randomly from a list of areas that can be reached in one day from the urban centre.

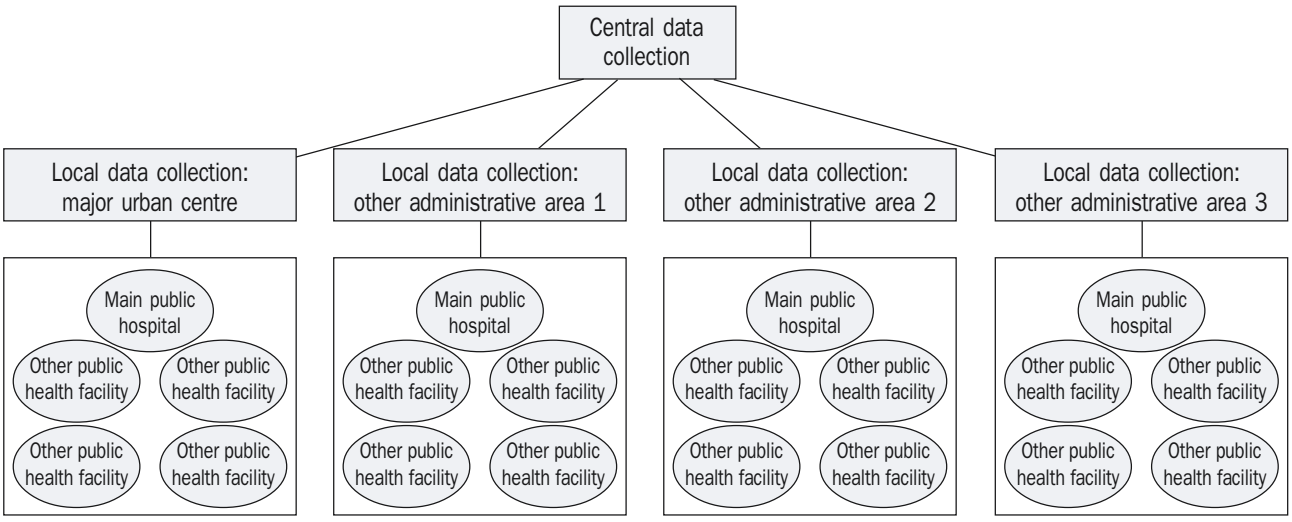
In a large country, distant or remote areas will be under-represented in a sample of this size. If you want to examine prices in a large country, it is preferable to conduct multiple surveys in different regions, with each survey collecting data in four geographic areas as above.

SELECTING A SAMPLE

Once geographic areas have been chosen, you will need to choose a sample of medicine outlets in which to gather data. A typical survey includes public health facilities, private pharmacies and one other type of medicine outlet. Generally, lists of public health facilities are available at central level, so these facilities can be selected centrally. However, accurate lists of private pharmacies, dispensing doctors or other private medicine outlets may need to be compiled in the field.

The overall sampling approach is shown in Figure 3.1.

Figure 3.1 Sampling approach



Retail pharmacies/medicine outlets in other sectors are selected according to their proximity to the public health facilities

Selecting public sector facilities

For convenience, public health facilities are used to anchor the sample, with other types of medicine outlet chosen by their proximity to these facilities. You will need to obtain lists of all public health facilities that have pharmacies or dispensaries in each survey area that are within a three hour drive of the main government hospital. Most countries have several levels of facilities, from hospitals down to health centres or dispensaries. Lower level facilities are often more widely dispersed than upper level ones. Generally, both upper and lower level facilities should be included if they are expected to stock most of the medicines included in the study.

Choose **at least five public health facilities in each survey area,** as follows.

1 Select the main public hospital in the area (district or regional hospital).

2 Select four facilities from the ones remaining on your list:
- If there is only one level of facilities on the list, choose four at random
- If there are two or more levels on the list:
  - Divide the list by level (hospitals versus all other facilities)
  - Select two facilities randomly from each level
- If there are fewer than two facilities on any list, increase the number selected from the other lists accordingly
- If there are fewer than five public health facilities in any of the administrative areas chosen for the survey, extend the lists to include the closest facilities in a neighbouring area.

Selecting private pharmacies

Private pharmacies will be sampled by their proximity to the public health facilities selected.

1 Obtain lists of pharmacies registered in each study area centrally if they are available (e.g. from the Ministry of Health, Pharmacy Association or business registry). The lists may be incomplete so they should be checked and updated by the area supervisor in the study area by consulting with local officials. These lists can help to guide the pharmacy selection process.

2 Once the public health facilities have been selected, the pharmacy that is closest to each facility should be selected by the area supervisor.

3 If there is no pharmacy within 5 km of a remote facility, another pharmacy in the urban centre should be selected.

This process will result in a sample of **at least five pharmacies in each survey area**.

The process of selecting private pharmacies in the field is described further in Chapter 5.

Selecting other types of medicine outlet

Up to five outlets in each sample area will also need to be selected for the "other" sector in your survey. The selection procedure will depend on the nature of the sector. In your country, you may not have such sectors.

NGO health facilities

For a sector that includes NGO health facilities, the selection procedure is as follows.

1 Create centrally a list of all facilities in each survey area by consulting the proper administrative authorities.

2 From each list, choose the facility that is closest to each public health facility in the sample.

3 If there is no facility on the list within 10 km of a given public health facility, substitute another NGO health facility from the urban area.

4 If there are fewer than five facilities on the list, select all the facilities.

This process will result in a sample of **up to five NGO health facilities in each survey area**.

Other medicine outlets

For other types of medicine outlet (e.g. dispensing doctors, non-pharmacy medicine stores), the sample will usually have to be selected locally, as with pharmacies. The process of selection is described in Chapter 5.

This process will result in a sample of **up to five other medicine outlets in each survey area**.

Experience from pilot studies confirms the importance of following the survey design and process described above and paying particular attention to the sampling technique. Selecting a smaller sample size, for instance, weakens the validity of the data.

PLANNING TIMELINE

Once the sample has been selected, you will need to prepare a timetable of activities. Experience from pilot field studies indicates that a survey should take between six and eight weeks to complete, including data analysis and report writing. Further time should be included for advocacy.

Figure 3.2 shows the main steps in the survey and indicates activities that need to be undertaken at:

- Central level
- Field level.

Figure 3.2 also indicates the section of the manual in which each activity is described in detail.

SEEKING ENDORSEMENTS

A signed, official letter endorsing the price survey can be of great help to all involved in carrying out the survey. If the survey manager can approach the relevant bodies with an example of the kind of letter that is sought, it may be

Figure 3.2 Steps in conducting the survey

Activity	Central/field level	Reference
Identify Advisory Group	Central	pp. 20–21
Fill in National Pharmaceutical Sector form	Central	pp. 28–29
Determine scope of survey (national/regional) and identify sectors	Central	p. 23
Select geographic study areas	Central	p. 24
Prepare budget and secure funds	Central	p. 22
Seek endorsements	Central	pp. 26–27
Finalize list of medicines to be surveyed	Central	pp. 29–38
Identify health facilities	Central	pp. 24–26
Select and train area supervisors	Central	p. 45
Identify pharmacies and medicine outlets	Field	pp. 45–46
Select and train data collectors	Field	pp. 47–48
Prepare data collection forms	Field	p. 49
Prepare letter of introduction	Field	p. 50
Schedule survey visits	Field	pp. 49–50
Conduct survey	Field	pp. 52–57
Identify components of medicine prices	Central	pp. 38–43
Data entry	Central	pp. 58–74
Data analysis and interpretation	Central	pp. 75–97
Compare with survey data from other countries	Central	pp. 98–103
Identify policy options	Central	pp. 104–108
Write report	Central	pp. 109–110
Present findings and advocate for change	Central	pp. 110–112

Note: as an alternative, data collectors can be selected centrally and survey all geographic areas

easier for the Ministry of Health or the Pharmacy Association to provide such an endorsement for the survey. An example of a letter of endorsement, shown in Annex 1, is included as a Word file on the CD-ROM which you can modify locally, as appropriate. WHO will also provide a letter of endorsement on request. Contact the Essential Drugs and Medicines Policy Department by e-mail at medicineprices@who.int.

4

Data collection at central level

- Standard survey forms are provided on the CD-ROM
- The National Pharmaceutical Sector form should be completed before data collection begins in the field
- The Medicine Price Data Collection form should be reviewed, the core list of medicines checked and the supplementary list added
- For price comparisons between countries and for repeated surveys it is of utmost importance not to divert from the selected medicines, their strengths and dosage forms and to use the pack size recommended, wherever possible.

Before data collection commences in the field, some data need to be collected at central level.

NATIONAL PHARMACEUTICAL SECTOR FORM

The National Pharmaceutical Sector form is used to collect baseline information on national medicines policy, procurement and distribution, government and private sector price policy and financing of medicines. This will provide a good overview of the pharmaceutical sector in your country which will help you in interpreting the survey findings and identifying policy options.

This form should be completed by the survey manager at central level.

Completing the National Pharmaceutical Sector form

The National Pharmaceutical Sector form is shown in Annex 2.

1 Transfer the National Pharmaceutical Sector form to your computer. You can do this by:
   - Copying the file from the CD-ROM that accompanies this manual
   - Downloading the latest file from the HAI website: (http://www.haiweb.org/medicineprices).

2 As soon as you open the file, save it with a filename that indicates the year of your survey so that you retain a clean form to use for future surveys. For example, you might choose a filename such as NPS.03.xls.

3 Complete the whole form, ensuring that you record the following information on the first page:
   - Daily wage of the lowest paid unskilled national government worker
   - Exchange rate.

   This information will later need to be entered into the computerized *Workbook* (see Chapter 7).

Information should be available from the Ministry of Health or the local WHO office. In addition, the following sources may be useful:

- WHO Medicines Database: http://www.who.mednet.int (online registration required)
- WHO/Euro country profiles: http://www.euro.who.int/InformationSources/Evidence/20010828_1
- PAHO/AMRO country profiles: http://www.paho.org/english/sha/profiles.htm

Wage level

The daily wage of the lowest paid unskilled national government worker will be used to measure the affordability of medicines.

You may be able to obtain this information from the personnel office in the Ministry of Health. If it is not available, contact a recently employed low-level worker to find out the **net** salary:

- After all compulsory deductions of charges and taxes
- Excluding allowances: e.g. housing, travel, hardship, leave allowance.

Reduce the salary to a daily wage by dividing by 365, 30, 14 or 7, depending on the pay period.

Exchange rate

Enter the rate of exchange to US dollars. The exchange rate is the commercial "buy" rate on the first day of data collection.

MEDICINE PRICE DATA COLLECTION FORM

The model Medicine Price Data Collection form should be used as the basis for the Medicine Price Data Collection form used in the field to collect data on the retail prices and availability of medicines. You will need to download this form onto your computer and amend it so that it contains the medicines on the core list and the supplementary list in your country. As with the National Pharmaceutical Sector form, you can do this by:

- Copying the file from the CD-ROM that accompanies this manual
- Downloading the latest file from the HAI website: http://www.haiweb.org/medicineprices.

As soon as you open the file, save it with a filename that indicates the year of your survey, such as MPDC.03.xls.

Core list of medicines

Figure 4.1 shows the core list of 30 medicines that should be included in the survey if they are available in your country. This list appears in Column A of the Medicine Price Data Collection form.

Figure 4.1 Core list of medicines to be surveyed

Generic name	Dose	Dosage form	Medicine category
Aciclovir	200 mg	tablet	Antiviral
Amitriptyline	25 mg	tablet	Antidepressant
Amoxicillin	250 mg	capsule/tablet	Antibacterial
Artesunate	100 mg	tablet	Antimalarial
Atenolol	50 mg	tablet	Antihypertensive
Beclometasone	50 mcg per dose	inhaler	Antiasthmatic
Captopril	25 mg	tablet	Antihypertensive
Carbamazepine	200 mg	tablet	Antiepileptic
Ceftriaxone	1 g	powder for injection	Antibacterial
Ciprofloxacin	500 mg	tablet	Antibacterial
Co-trimoxazole	(8 + 40) mg/mL	paediatric suspension	Antibacterial
Diazepam	5 mg	tablet	Anxiolytic
Diclofenac	25 mg	tablet	Antiinflammatory
Fluconazole	200 mg	tablet/capsule	Antifungal
Fluoxetine	20 mg	tablet/capsule	Antidepressant
Fluphenazine decanoate	25 mg/ml	injection	Antipsychotic
Glibenclamide	5 mg	tablet	Antidiabetic
Hydrochlorothiazide	25 mg	tablet	Antihypertensive
Indinavir	400 mg	capsule	Antiviral
Losartan	50 mg	tablet	Antihypertensive
Lovastatin	20 mg	tablet	Serum lipid reducing
Metformin	500 mg	tablet	Antidiabetic
Nevirapine	200 mg	tablet	Antiviral
Nifedipine retard	20 mg	retard tablet	Antihypertensive
Omeprazole	20 mg	capsule	Antacid
Phenytoin	100 mg	tablet	Antiepileptic
Pyrimethamine with sulfadoxine	(500+25) mg	tablet	Antimalarial
Ranitidine	150 mg	tablet	Antacid
Salbutamol	0.1 mg per dose	inhaler	Antiasthmatic
Zidovudine	100 mg	capsule	Antiviral

Modified release formulations

Most tablets and capsules are designed so that the active ingredient(s) is released immediately the medicine is taken. Others have modified release characteristics. These are referred to using a number of terms including sustained release (SR), slow release (SR), controlled release (CR), retard, modified release (MR) or long acting (LA) tablets or capsules. These work by gradually releasing

the active ingredient as the capsule or tablet moves down the gastrointestinal tract. Some medicines are marketed in both immediate release and modified release formulations. In Kenya, for example, nifedipine is available as 10 mg, 20 mg and 30 mg capsules, 10 mg and 20 mg tablets, 10 mg and 20 mg retard tablets, 10 mg and 20 mg SR tablets, and 30 mg LA tablets. It is vital that you collect the price of the medicine, dosage form and strength as stated on the form. The only modified release preparation on the core list of medicines is nifedipine retard 20 mg tablets. Collect data *only* on the 20 mg retard formulation, in tablet form. Be aware that nifedipine is available in various forms and strengths.

Core list of medicines

The first step in preparing the Medicine Price Data Collection form is to prepare the core list of medicines for your country and to amend the form, if necessary.

1 Review the list of 30 core medicines in Column A of the form.

2 If any medicines on the core list are unavailable in your country, delete them from the core list on the form in the Word file. When data processing begins, they will also need to be deleted from the core list in the *Workbook* (see Chapter 7).

3 If a medicine is available in your country, but the stated dosage form or strength differs from that on the core list, delete it from the core list and include it in the supplementary list of medicines.

4 If a pharmaceutically equivalent medicine is widely used instead of a medicine on the core list, you may wish to add it to your supplementary list of medicines.

Some substances remain under patent in countries that observe medicine patents; others are off patent or have never been patented. As patent status varies by country and over time, this manual cannot identify the patent status of the core medicines, but some new medicines are included that are still under patent in the USA and/or Europe.

The core list should not be considered as a recommendation for inclusion in national treatment guidelines.

Medicine quality

The availability and use of substandard and counterfeit medicines are serious problems in some countries, particularly in those where there is a poor regulatory framework or inadequate enforcement of relevant laws and regulations. In order to ensure that information is not collected on substandard or counterfeit medicines, all products included in the survey must be registered or have market authorization in your country.

Supplementary list of medicines

The next step is to prepare the supplementary list of medicines for your country. Up to 20 medicines supplementary to the core list may be selected for domestic comparison and for monitoring trends over time. The supplementary list of medicines should reflect national or local disease and treatment priorities, based on criteria such as:

- Burden of disease
- Local production

- Availability of fixed dose combination products
- Availability of an international reference price (MSH or other).

Examples of diseases with high prevalence in certain regions are tuberculosis, malaria, sleeping sickness, trachoma, anaemia and parasitic diseases. If your country has a high prevalence of HIV/AIDS and antiretroviral triple therapy is available, you should include one of the fixed dosage combinations or the single medicines constituting first line Highly Active AntiRetroviral Therapy (HAART), if this is in use and if the medicines in the national guidelines differ from the ones included in the core list.

In many countries, combination products are more common than products with single agents. The WHO Essential Medicines List prefers to use products with one single ingredient which allows more flexibility in prescribing and dosing, although there is now an increasing move towards fixed dose combinations for malaria, tuberculosis and HIV. This is also the policy of many regulatory authorities and agencies that develop therapeutic guidelines. This may be one reason why you may find few of the products on the core list of medicines. If so, you may wish to include some combination products on your supplementary list of medicines to better reflect the national situation. Be aware, though, that this may limit the number of generically equivalent alternatives because different manufacturers may use different combinations.

International reference prices

The medicine, dosage form and strength should have an international reference price (see Chapter 7).

Wherever possible, only prescription medicines should be included on the supplementary list of medicines.

Components of the Medicine Price Data Collection form

For each medicine, there are three rows and nine columns. Rows 1 and 2 of the form should be completed at central level before the survey starts.

Row 1: The first row is for recording information on the innovator brand. It may be changed to the brand name for the same product used by the manufacturer in your country (see p. 34 and Chapter 6).

Row 2: The second row is for recording information on the most sold generic product equivalent to the innovator brand (see p. 34 and Chapter 6).

Row 3: The third row is for recording information on the lowest price generic product equivalent to the innovator brand. The data collectors will identify this product in each medicine outlet surveyed and enter the information onto the form (see p. 35 and Chapter 6).

For the purpose of this study, the following definitions are used:

- Innovator brand: the originator pharmaceutical product
- Generic equivalent: all products other than the innovator brand that contain the same active ingredient (substance), whether marketed under another brand name or the generic name.

See the Glossary for fuller definitions of innovator brand and generic equivalent.

Rows 2 and 3 for each medicine can be identical if the most sold generic equivalent is also the lowest priced. However, the product in Row 1 can appear *only* in that row.

Figure 4.2 shows an extract from the Medicine Price Data Collection form. Note that some cells are shaded grey. These cells should not be amended.

Figure 4.2 Extract from the Medicine Price Data Collection form: core list of medicines

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recommended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Aciclovir tab 200 mg	Zovirax	GSK		25			/tab	
Most sold generic equivalent				25			/tab	
Lowest price generic equivalent				25			/tab	
Amitriptyline tab 25 mg	Tryptizol	MSD		100			/tab	
Most sold generic equivalent				100			/tab	
Lowest price generic equivalent				100			/tab	
Amoxicillin caps/tab 250 mg	Amoxil	SKB (GSK)		21			/tab	
Most sold generic equivalent				21			/tab	
Lowest price generic equivalent				21			/tab	

In public, private and "other" health facilities, there will generally be only one product and hence only one price per medicine to collect. In private pharmacies, a wider range of innovator brands and generic medicines is usually available so the prices of all three (innovator brand, most sold generic equivalent and lowest price generic equivalent) are likely to be collectable.

Supplementary list of medicines

Once the core list of medicines has been reviewed and, where necessary revised, add your supplementary list of medicines to the Medicine Price Data Collection form in the Word file. They should appear in the same form as on the core list, and should state the dosage form and strength.

Figure 4.3 shows an example of a supplementary list of medicines in which the brand name and manufacturer of the innovator brand have been added. Note that

Figure 4.3 Example of Medicine Price Data Collection form: supplementary list of medicines

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recommended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Albendazole tab 200 mg	Zental	GSK		2			/tab	
Most sold generic equivalent				2			/tab	
Lowest price generic equivalent				2			/tab	
Lamivudine+zidovudine tab 150+300 mg	Combivir	GSK		60			/tab	
Most sold generic equivalent				60			/tab	
Lowest price generic equivalent				60			/tab	
Metronidazole tab 200 mg	Flagyl	Aventis		200			/tab	
Most sold generic equivalent				200			/tab	
Lowest price generic equivalent				200			/tab	
Amoxicillin+clavulanic acid tab 250+125 mg	Augmentin	GSK		21			/tab	
Most sold generic equivalent				21			/tab	
Lowest price generic equivalent				21			/tab	

for each medicine, the innovator brand, most sold generic equivalent and lowest price generic equivalent have the same recommended pack size.

To facilitate data collection, the core medicines and supplementary medicines can be combined into one list in alphabetical order by generic name on the Medicine Price Data Collection form.

When medicine names are entered into the computerized *Workbook*, the core medicines and supplementary medicines will be combined automatically into one list.

Row 1: Identifying the innovator brand product

For each medicine, the form lists the innovator brand name that is most commonly used by the manufacturer in English-speaking countries. If the manufacturer uses another brand name in your country, change the innovator brand name on the form.

Row 2: Identifying the most sold generic equivalent

Row 2 for each medicine is used for measuring the price of the most sold generic equivalent to the innovator brand that is listed in Row 1. Official figures may be publicly available in your country on the most sold products in sales volume in the private sector. Other sources include IMS Health, insurance companies, customs and the government body responsible for the pharmaceutical sector. Where such data are not available, it is recommended to undertake an initial survey of large geographically dispersed pharmacies or wholesalers, perhaps by telephone.

Enter the name of the product and the manufacturer on the form. Note that the product may not be the most sold generic equivalent in *all* individual pharmacies.

The Medicine Price Data Collection form is modelled on the private sector which will have the widest range of medicines and in which it will normally be possible to find the innovator, most sold generic equivalent and lowest price generic equivalent for each medicine.

In all sectors, there may be only one or two products for each medicine; if this is the case, enter information as follows:

- If there is no innovator brand, leave Row 1 blank
- If there is only one generically equivalent product available, it will be both the most sold and the lowest price generic equivalent: enter the same information in Row 2 and Row 3 and note this in the 'Comments' column (Column I)
- If more than one generically equivalent product is available and the most sold generic equivalent also has the lowest price, enter the information for the most sold generic equivalent in both Row 2 and Row 3 and note this in the 'Comments' column (Column I).

The name of each most sold generic equivalent surveyed will be the same for all pharmacies and other medicine outlets and should be entered at central level. The price of the product may differ, however, and will be collected in each facility.

Row 3: Identifying the lowest price generic equivalent

Row 3 is for collecting information on the lowest price generic product equivalent to the innovator brand (Row 1) found in a pharmacy or other medicine outlet. The product's name and manufacturer is identified in each pharmacy and medicine outlet surveyed. The data collectors will need to enter the following information for each medicine listed on the form (see Chapter 6):

- Column B: the name of the lowest price generic equivalent
- Column C: the manufacturer of the lowest price generic equivalent.

The lowest price generic equivalent identified in each pharmacy may vary. The name may also vary between pharmacies and other medicine outlets.

Column A: Name of medicine, dosage form and strength

Column A lists:

- International Non-proprietary Name (INN) of the medicine
- The dosage form of the medicine
- The strength of the medicine.

Do not change Column A of the core list in the Medicine Price Data Collection form.

A medicine may be available in different dosage forms: tablet/capsule, mixture/syrup, suspension, injection, cream/ointment and so on. Tablets and capsules are normally considered equivalent, unless they are retard, SR, etc. (see p. 30).

Information should be collected only for the dosage form listed in Column A. The oral form is used for most substances. Plain tablets or capsules should be used for all oral dosage forms, with the exception of nifedipine.

Some medicines will be marketed in more than one strength: for example, fluconazole may be marketed as 50 mg, 150 mg and 200 mg tablets/capsules. The Medicine Price Data Collection form lists the strength selected for inclusion in the survey; this is the *only* strength on which information should be collected. If this strength is not marketed in your country, delete the medicine from the core list on the form. If only other dosage forms or strengths are used, you may choose to add the medicine to your supplementary list with the dosage form and strength used in your country.

Column B: Brand name

The form lists the most common innovator brand name used in Anglophone countries for each medicine. However, the manufacturer may not use the same name worldwide; for example, omeprazole is called both Prilosec and Losec, and fluoxetine is called both Prozac and Fontex. Other names may also be used. If the innovator brand name used in your country differs from the one on the form, you can change the name of the medicine on the core list, *as long as the medicine, the dosage form and strength are the same.*

An innovator brand has been identified for all 30 substances on the core list of medicines. If your supplementary list includes old medicines that were probably never patented, choose the most expensive brand name product in the market and enter the name in Column B and the manufacturer in Column C of the form.

Column C: Manufacturer

In Row 1, this column contains the name of the innovator (patent holder). In Row 2, the manufacturer's name for the generically equivalent product to be monitored should be entered. The data collectors will complete Row 3 in each individual pharmacy with the name of the manufacturer of the cheapest generic equivalent found there (see Chapter 6).

Column D: Available

Medicine Procurement Prices

Column D should be completed at central level in the office of the procurement officer or central medical stores to indicate all medicines on the list that are available.

Public Sector Patient Prices, Private Sector Retail Prices and Other Sector Patient Prices

This column will be completed by the data collectors in the field. They should record that the innovator brand, most sold generic equivalent and lowest price generic equivalent are available only if they actually see a pack of the medicine.

Column E: Pack size recommended

All the medicines on the core list are in oral solid form (tablet or capsule), with the exception of:

- Ceftriaxone injection
- Co-trimoxazole paediatric suspension
- Fluphenazine decanoate injection
- Beclometasone and salbutamol inhalers.

There may be several pack sizes available, such as a box or pack of 30, 100, 250 or 1000 tablets or capsules, and single vials, 10 vials or 100 vials for injection. Mixtures may be available in different volumes: e.g. 50 ml, 70 ml, 100 ml. The price per unit may vary between pack sizes. One pack size for each medicine has been selected in order to facilitate comparisons between products, sectors and countries.

Column E lists the recommended pack size to monitor; this is as close to recommended treatment lengths as possible. Chapter 6 gives guidance on what data collectors should do if that pack size is not available.

The public sector and "other" sector are likely to have less variety of products and larger pack sizes. If the pack size of a medicine is standard and is known centrally, amend the form before data collection begins.

Column F: Pack size found

This column should be completed by the data collectors in the field.

Column G: Price of pack found

This column should be completed by the data collectors in the field.

Column H: Unit price

This column should be completed by area supervisors after the data collectors have returned their completed forms and these have been checked at the end of the day in the field.

Column I: Comments

Column I is used for recording any comments on the medicines included in the core or supplementary lists, such as their unavailability in the country or their temporary unavailability in a specific pharmacy. Comments may be added by the survey manager, area supervisors or data collectors.

> The core and supplementary lists of medicines should be reviewed following the pilot test and, where necessary, revised before the survey begins.

Chapter 7 gives instructions on amending the core list of medicines, adding the supplementary list in the *Workbook* and entering price and availability data.

Figure 4.4 shows an extract from a completed Medicine Price Data Collection form: Medicine Procurement Prices in which the tender prices have been entered at central level. In some countries, central and regional tender prices may vary. For national surveys, use the central tender price. For regional surveys, use the regional tender price. Aciclovir is not on the Essential Medicines List in this example and price information is therefore not recorded for this medicine.

Figure 4.5 shows an extract from a Medicine Price Data Collection form: Private Sector Retail Prices in which the brand name and manufacturer of the most sold

Figure 4.4 Extract from a Medicine Price Data Collection form: Medicine Procurement Prices, with information entered at central level

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recommended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Aciclovir tab 200 mg	Zovirax	GSK		25			/tab	*Not on EML*
Most sold generic equivalent				25			/tab	
Lowest price generic equivalent				25			/tab	
Amitriptyline tab 25 mg	Tryptizol	MSD		100			/tab	
Most sold generic equivalent	*Amitriptyline*	*Pharma*	✓	100	*1000*	*970.00*	*0.9700*/tab	*Only 1 generic found*
Lowest price generic equivalent	*Amitriptyline*	*Pharma*	✓	100	*1000*	*970.00*	*0.9700*/tab	
Amoxicillin caps/tab 250 mg	Amoxil	SKB (GSK)		21			/tab	
Most sold generic equivalent	*Amoxicillin*	*Ratiopharm*	✓	21	*500*	*2407.00*	*4.8140*/tab	*Only 1 generic found*
Lowest price generic equivalent	*Amoxicillin*	*Ratiopharm*	✓	21	*500*	*2407.00*	*4.8140*/tab	

Figure 4.5 Extract from a Medicine Price Data Collection form: Private Sector Retail Prices, with information entered at central level

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recommended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Aciclovir tab 200 mg	Zovirax	GSK		25			/tab	
Most sold generic equivalent	*Acivir*	*Cipla*		25			/tab	
Lowest price generic equivalent				25			/tab	
Amitriptyline tab 25 mg	Tryptizol	MSD		100			/tab	*Not available in country*
Most sold generic equivalent	*Amitriptyline*	*Cosmos*		100			/tab	
Lowest price generic equivalent				100			/tab	
Amoxicillin caps/tab 250 mg	Amoxil	SKB (GSK)		21			/tab	
Most sold generic equivalent	*Moxacid*	*Dawa*		21			/tab	
Lowest price generic equivalent				21			/tab	

generic equivalent have been entered at central level. These cells are shaded grey because they should not be amended by data collectors in the field.

COMPONENTS OF MEDICINE PRICES

Prices can be seen as links in a chain, stretching from the manufacturer to the consumer. The computerized *Workbook* enables you to see how much is added to manufacturers' prices in the distribution process by comparing the median final price for each medicine with the manufacturer's unit price. This is known as the cumulative mark-up.

The study will also help you to identify each individual link in the price chain to give a full picture of the composition of the prices of one or two medicines.

The following components are commonly found in the medicines price chain:

- Manufacturer's import (selling) price (MSP) or procurement price
- Cost, insurance and freight (CIF)
- Import tax or duty
- Port and inspection charges
- Distribution margin/wholesale mark-up
- Retail mark-up
- Value Added Tax (VAT)/Goods and Services Tax (GST)
- Dispensing fees.

Governments may not always have a complete picture of the price components of medicines as different Ministries may be involved in their purchase and distribution. However, accurate information on the various price components, including the manufacturer's selling price, is required for reliable international price comparisons as well as to identify measures that can be taken to reduce the prices paid for medicines.

Information on some price components, such as procurement prices, can be obtained from official documents issued by the Ministry of Health, Finance, Industry or Trade and should be known to the Chief Pharmacist; see the column entitled "Possible sources of information" in Figure 4.6. For the private or "other" sector, however, it may be advisable also to check prices with a wholesaler or other sources to find out what they actually pay.

There may be special arrangements or exemptions from certain tariffs for some medicines, particularly in the public sector. This is the reason why price components should be identified in all sectors.

Procurement price or manufacturer's selling price (MSP)

Information on the procurement price or manufacturer's selling price (MSP) is sometimes not available in the private sector, but the aim of this survey is to identify it as accurately as possible. In the public and "other" sectors, it might appear as one of the following:

- The awarded tender price (if import, including CIF)
- The import price, if freight charges are included (CIF)
- The export price in the country the medicine is shipped from, if freight charges are not included: i.e. free on board (FOB)
- The price that the wholesaler or the public or private procurement agency pays a local manufacturer.

Figure 4.6 Possible medicine price components and sources of information

Tariff/tax	Possible sources of information
Manufacturer's selling price (MSP)	Manufacturer's list prices (from wholesalers), public sector tenders, customs declaration forms
CIF charge	Make a rough estimate: may vary or may not be included in tender price Tenders, customs declaration forms
Port charges, clearance	Customs, medical stores, importers
Import duty	May vary by product and/or sector Customs, Ministries of Health, Trade, Finance, medical stores, importers
Inspection	Medicines regulatory body
Fee to Pharmacy Council/Board	Ministries of Health, Trade, Finance, medical stores and/or statistics
Distribution margin/wholesale mark-up	Vary by sector. Margins charged by medical stores should be recorded here Wholesaler, medicines regulatory authority/Ministry of Health/Pharmacy Association/retailers
Retail mark-up	Applies to private sector Retailers, medicines regulatory authority/Ministry of Health/Pharmacy Association
Value Added Tax/Goods and Services Tax	Retailers
Dispensing fees	Pharmacies, Ministries of Health or Trade

For the private sector, the wholesaler(s), customs or the Ministry of Health will often be able to provide information on the import price and/or its buying price (import price + port charges).

Cost, insurance and freight (CIF)

For imported products, cost, insurance and freight is the price paid to the manufacturer or wholesaler from whom the product is imported. This means that the landing cost includes insurance and freight.

If insurance and freight are not included, the landing cost is FOB (free on board) and the recipient will pay insurance and freight. If these charges appear separately, they should be recorded and added to the manufacturer's selling price.

Import tax or duty

Import tax or duty can be quite substantial. If there is an import tax, it may apply to some or all imported medicines. Possible exemptions include:

- Some or all of the medicines on the essential medicines list
- Medicines for public health programmes
- Some or all of the medicines on the public tender
- Medicines imported by NGOs
- Donations.

Check whether the same level of tax or duty applies to all products. Exemptions and deviations should be recorded: for example, if some of the medicines monitored are exempt, others may be taxed. Note that import tax or duty may also apply to imports of raw material for local production, but this should not be recorded here.

Port and inspection charges

Other charges may apply to cover such costs as clearance, storage in port and inspection. Governments may charge for documentation, such as data collection for statistical purposes.

Distribution margin/wholesale mark-up

A mark-up is a certain percentage added to the purchasing price to cover the costs and profit of the wholesaler or retailer.

It is common to find that a ceiling applies and the government allows a maximum percentage to the wholesale mark-up. However, you may also find that pricing is free: that is, the government does not restrict the margins and manufacturers, wholesalers and pharmacies may charge what they wish.

The wholesale mark-up can also be recorded as the difference between:

- The wholesaler's buying price: the price paid to the manufacturer/ importer
- The pharmacy's buying price: the price paid to the wholesaler.

Retail mark-up

The retail mark-up is the percentage that retailers (pharmacies) add to cover their costs, including profit. It is common to find that a ceiling applies and the government sets a maximum percentage mark-up. The government may also set a maximum sales price and leave it to the wholesaler and retailer to agree on their respective mark-ups (see Glossary: Rebate).

Pharmacies may charge different mark-ups on innovator brands and generically equivalent products. In some countries, for example, the mark-ups are higher on generic equivalents because they are considered to be very cheap. If this applies, it should be recorded on the form even if the precise figures are unknown.

In some countries, there may be different maximum mark-ups for different price bands: this is called "degressive mark-up" and means that a more expensive medicine will have a lower mark-up. If this is the case, record both the lowest and the highest mark-ups (e.g. 11% and 25%).

To ensure reliability, information on retail mark-ups should be collected on a number of different medicines (three are recommended). This is particularly important in countries where prices are not regulated or where regulations are not enforced. If medicines are sold in the informal sector (medicine outlets), it is recommended that information is collected from these facilities as well.

Value Added Tax (VAT)/Goods and Services Tax

The size of a Value Added Tax on goods varies considerably from country to country, ranging from 2% up to 25% in some European countries, for instance. VAT may also vary from state to state within a country, as in Brazil and the USA. In many countries, however, medicines are exempted from VAT. VAT is normally charged at all levels. Retailers pay cost plus VAT and add VAT to their selling price. The VAT is then refunded to them so that each link pays VAT only once. Only the VAT added to the final price (which is paid by the patient) should be recorded.

In some countries, a Goods and Services Tax (GST) or other sales tax is charged on medicines. As with VAT, only the tax added to the final price should be recorded.

Distribution charges

In the public sector and in parts of the "other" sector, such as the church mission sector, medicines are distributed from a central warehouse directly to health facilities or via regional and/or district depots. Depending on the financing arrangements, a margin or fee may be charged per level to cover handling and transport between the different levels of depot and lastly to the health facility. All margins of this kind are components of the final price and should be recorded for these sectors in the Price Composition: Components page in the *Workbook*.

Dispensing fees

Pharmacies may be allowed to charge a dispensing fee; this is normally a fixed fee per prescribed item instead of, or in addition to, a percentage mark-up. The fee more accurately reflects the work involved in handling a prescription; a percentage mark-up makes profit dependent on the sale of expensive medicines.

Price components that should *not* be entered in the Price Composition: Components page in the *Workbook*

The following components of the medicine price should **not** be entered in the Price Composition: Components page in the *Workbook.*

Registration fees

The National Medicines Regulatory Authority or Medicines Control Agency may charge a fee when a product is registered in the country plus an annual fee for as long as the product is on the market. As these fees are charged only when a market authorization is issued or as an annual fee per product, irrespective of sales volume, they should not be included here as a price component, but should be recorded on the National Pharmaceutical Sector form (Annex 2).

Patient co-payments and fees for service

Information on the following charges should be recorded on the National Pharmaceutical Sector form (Annex 2):

- Patient co-payments: payments by patients of a fixed amount per prescribed medicine, even if reimbursement applies
- Fees for services in addition to the cost of the medicine, such as the doctor's consultation.

Where a standard charge (e.g. fee for the consultation/fee for service, including medicines) is set for all patients in public health facilities, data collection on pricing at each individual facility is not necessary. The information should be recorded on the National Pharmaceutical Sector form (Annex 2). However, data on availability should still be collected in individual facilities.

Note on prices in the public and "other" sectors

One or both of these sectors may provide medicines free to patients or for a fixed fee (see below). If patients do not pay the full price of the medicines, the procurement prices (e.g. from a tender, if available) should be entered on the form at central level. The data collectors should then simply record whether the medicine is available or not in each facility they visit.

Informal charges

There may also be informal charges about which no information is publicly available. The only way of measuring these charges is by household surveys (interviewing patients at home) or exit interviews (interviewing patients when they leave the pharmacy or doctor). Surveys of this kind are not covered here, but can be developed as separate projects.

Collecting data on the components of medicine prices

Data on the components of medicine prices should be collected at central level and entered directly into the *Workbook*. It is recommended that you select three tracer medicines (i.e. three medicines on the core list of medicines) that are widely used in all sectors in your country. You will need to add the price components that apply in your country. Collect data on each product for each sector (i.e. a total of up to 12 sets of data).

Chapter 7 describes how to enter data on price components in the *Workbook*. Print this page from the *Workbook* and fill in the price components. The worksheet contains eleven columns, as shown in Figure 4.7. Columns B–F identify the medicine and the dispensed quantity and Columns G–K itemize the price components and mark-ups, as follows.

B Name of the medicine.

C Medicine strength: this is entered automatically when the name of the medicine is entered into the *Workbook*.

D Dosage form: this is entered automatically when the name of the medicine is entered into the *Workbook*.

E Target pack size: this is entered automatically when the name of the medicine is entered into the *Workbook*.

F Dispensed quantity.

G Type of charge: identifies the type of charge added to the CIF price of the medicine. You should complete this according to your country's charging structure.

Figure 4.7 Extract from a Price Composition: Components page of the *Workbook*

Describe sector and type of medicine	

A	B	C	D	E	F	G	H	I	J	K
	Example 1: Medicine name	**Medicine Strength**	**Dosage Form**	**Target Pack Size**	**Dispensed Quantity**	**Type of Charge**	**Charge Basis**	**Amount of Charge**	**Price of Dispensed Quantity**	**Cumulative % Mark-up**
						Cost, insurance, freight (CIF) price	NA	NA		0.00%

H Charge basis: each individual type of charge will be either a percentage addition or a flat rate fee. Identify the category that applies to each charge.

I Amount of charge: enter either the percentage add-on or the flat rate amount.

J Price of dispensed quantity: the *Workbook* automatically calculates the price of the dispensed quantity at each point in the price chain.

K Cumulative % mark-up: this is calculated automatically by the *Workbook*, based on all the preceding components. The last figure in this column indicates the total value of local add-ons to the CIF price of the medicine.

AFFORDABILITY

Treatment course

Figure 4.8 lists nine preselected clinical conditions (ten medicines) for which the cost of treatment, and hence its affordability, will be calculated by sector. These conditions have been selected to facilitate international comparisons. However, you may wish to include additional conditions and treatments in the *Workbook* – or alternatives if some of the medicines are not included in your survey.

Figure 4.8 List of pre-selected conditions and medicines to determine affordability

Condition	Medicine, strength, dosage form	Daily dose	Treatment duration (days)	Total no. units per course of treatment	References
Diabetes	Glibenclamide 5 mg tablets	2 tablets	30	60	WHO Model Formulary 2002; BNF 43 (Mar 2002) Section 6.1.2.1
Hypertension	Hydrochlorothiazide 25 mg tablets	1 tablet	30	30	WHO Model Formulary 2002; BNF 42 (Sept 2001) Section 2.2.1
	Atenolol 50 mg tablets	1 tablet	30	30	WHO Model Formulary 2002; BNF 43 (Mar 2002) Section 2.4
Respiratory tract infections: adults	Amoxicillin 250 mg capsules/tablets	3 capsules/ tablets	7	21	WHO Model Formulary 2002; BNF 43 (Mar 2002) Section 5.1.1.3
Respiratory tract infections: children 6 months–5 years	Co-trimoxazole paediatric suspension 40+200 mg/ 5 ml	10 ml	7	70	WHO Model Formulary 2002; BNF 43 (Mar 2002) Section 5.1.8
Gonorrhoea	Ciprofloxacin 500 mg tablets	1 tablet	1	1	WHO Model Formulary 2002; BNF 43 (Mar 2002); Section 5.1.12
Arthritis	Diclofenac 50 mg tablets	2 tablets	30	60	BNF 43 (Mar 2002); Section 10.1.1
Depression	Amitriptyline 25mg tablets	3 tablets	30	90	WHO Model Formulary 2002; BNF 43 (Mar 2002) Section 4.3.1
Asthma	Salbutamol inhaler 0.1 mg/dose	As needed		200 doses (1 inhaler)	WHO Model Formulary 2002; BNF 43 (Mar 2002) Section 3.1.1.1
Peptic ulcer	Ranitidine 150 mg tablets	2 tablets	30	60	BNF 43 (Mar 2002); Section 1.3.1

WHO Model Formulary 2002 is available electronically at http://www.who.int/medicines/organization/par/formulary.shtml
The British National Formulary is available electronically at http://bnf.vhn.net/home/

The treatment courses for the medicines included in the core list are based on guidelines in the WHO Model Formulary and the British National Formulary (BNF), as in the following examples:

- One dose for gonorrhoea
- Seven days for an acute infection
- 30 days for a chronic treatment in adults.

The WHO Model Formulary and the BNF have been selected because the recommendations on dosages are well-known and accepted and because they can both be accessed electronically. It is important to note that the courses of treatment used in this manual are statistical or average measures that are used to standardize the methodology and facilitate international comparisons. They should not be regarded as recommendations on treatment courses; although they are based on internationally accepted clinical guidelines, other guidelines for treatment may be in use locally or nationally.

You are requested to use the treatment courses given in Figure 4.8 to enable international comparisons to be made. However, if your country uses other dosage schedules, these may be used for the national report. For your national survey, you may also wish to make comparisons, such as between the affordability of old and new medicines.

Chapter 7 explains how to use the computerized *Workbook* to enter data on medicine prices. The treatment cost and affordability are calculated automatically by the *Workbook.*

Benchmark

The benchmark of the daily wage of the lowest paid, unskilled national government worker is regarded as the most reliable and accessible measure for judging affordability. The information is also easily available and locally understandable. A large proportion of the population will, of course, earn less than an unskilled government worker, but a treatment that is not affordable to the lowest paid government worker is definitely not affordable to those on incomes below that level.

5

Preparation for data collection in the field

- The sampling and selection of public sector health facilities should be completed before preparation for fieldwork begins
- Careful selection and training of data collectors is required
- A pilot test should be conducted during the training of data collectors to give data collectors practice in collecting data and to identify any amendments needed to the Medicine Price Data Collection form
- A letter of introduction should be prepared for data collectors.

The success of the medicine pricing survey is dependent on the collection and recording of accurate, reliable data by the data collectors in the field. This requires careful planning and preparation for fieldwork. This chapter deals with the issues that need to be addressed when preparing for the field survey. It builds on information already discussed in the previous chapters.

GUIDANCE FOR AREA SUPERVISORS

Area supervisors should be thoroughly familiar with the contents of this manual in order to ensure a consistent approach to the organization of data collection in the field. In particular, the survey manager should highlight the following issues during training:

- Sampling private sector retail pharmacies and other medicine outlets
- Gaining access to health facilities, pharmacies and other medicine outlets
- Preparing the Medicine Price Data Collection forms
- Daily check of completed forms
- Field supervision
- Calculating the unit prices of medicines.

SAMPLING SITES

The selection of public health facilities for data collection should be made by the survey manager at central level (see Chapter 3). However, most or all of the private sector retail outlets will have to be identified locally by the area supervisors.

Private sector retail pharmacies

The private pharmacies will be sampled by their proximity to the public health facilities selected, so sampling will usually have to be done locally in the field by the area supervisor. The sampling process will be easier if a list of pharmacies registered in each study area is provided by the survey manager.

Once the public health facilities have been selected, the pharmacy that is closest to each facility should be selected. If there are a number of pharmacies close to each facility, one should be selected at random, using the list of registered pharmacies obtained at central level. If there is no pharmacy within 5 km of a facility, no pharmacy should be chosen for that facility, but another pharmacy in the urban centre should be substituted.

This process will result in the selection of **at least five pharmacies in each survey area**.

"Other" sector medicine outlets

The selection of medicine outlets in the "Other" sector will depend on the nature of the sector chosen.

If the sector includes NGO health facilities, the sampling should have been completed at central level (see p. 26). This will result in a sample of **up to five NGO health facilities in each survey area**.

For other types of medicine outlet (e.g. dispensing doctors, non-pharmacy drug stores), the sample will usually have to be selected locally, as with pharmacies.

Once the public health facilities have been selected, the medicine outlet that is closest to each facility should be selected. If there are a number of medicine outlets close to each facility, one should be selected at random. If there is no medicine outlet within 5 km of a facility, no outlet should be chosen for that facility, but another outlet in the urban centre should be substituted.

This process will result in a sample of **up to five other medicine outlets in each survey area.**

Back-up facilities

In addition to the pharmacies and other medicine outlets selected for inclusion in the survey, two back-up facilities should be identified in advance for each team of data collectors each day. Data collectors should visit a pre-selected back-up facility if:

- Less than 50% of the medicines on the Medicine Price Data Collection form are available
- Health facility, pharmacy or medicine outlet managers will not give permission for data collection, even after being shown the letter of introduction and being assured of anonymity.

Where possible, two back-up facilities should be identified in advance for each team of data collectors each day.

SELECTING DATA COLLECTORS

Data collectors will need a basic knowledge of pharmaceuticals, some understanding of the principles of sample surveys and an appreciation of the logistical requirements for carrying out field studies. The survey methodology has been designed to minimize as far as possible the need for a high level of sophistication in these areas although in-depth follow-up activities will in many cases require a higher level of technical expertise.

Criteria for selecting data collectors

Data collection can be tedious work and requires an aptitude for concentration and attention to detail. The best data collectors combine the discipline of collecting data in a standardized way with the flexibility to adapt procedures to the requirements of unusual situations.

Data collectors should be familiar with pharmaceuticals and the different dosage forms and pack sizes in order to be able to extract the required information, both from health professionals and from written material such as packs and order lists, and to record it accurately during observations.

The most effective data collectors are likely to be people with relevant experience such as pharmacists, pharmacy technicians and nurses. However, other Ministry of Health staff and temporary employees with some health-related experience can be hired specifically to collect and record data. At a minimum, post secondary school education is required. Familiarity with the local dialect will be advantageous.

The process of data collection is separate from data entry and processing which will be undertaken at a later stage. Data collectors should be trained to record only the information required.

Lessons from the field

In the field study in South Africa, regional pharmacists were recruited as data collectors because they are known to the pharmacists and doctors in the area and also know the facilities in the area.

TRAINING DATA COLLECTORS

Data collectors should be well trained to ensure the accuracy and reliability of the data gathering procedure. Training should focus on teaching the participants:

- The overall purpose of the survey
- How to collect data
- How to complete the Medicine Price Data Collection form.

Figure 5.1 on p. 48 shows an example of a training plan for data collectors.

The Medicine Price Data Collection form must be available during training sessions so that the data collectors are made aware of the data to be collected and how to complete the form.

Wherever possible, data collectors should work in teams of two. To ensure consistency in results, it is preferable to train all data collectors together and then allow them to practise together at the pilot sites. This is an important step that will provide an opportunity to identify and solve unforeseen problems and help

Figure 5.1 Example of a training plan

	Training activity	Time
Day 1	General introduction	1 hour
	Introduction of data collectors	
	General presentation: ■ Purpose of the survey ■ Training objectives ■ Location of survey sites ■ Discussion on data collectors' expectations and/or concerns ■ Work schedule and compensation	
	Review of Medicine Price Data Collection form	2–3 hours
	Role play in small groups to check reliability of data collection skills	1 hour
	Pilot test: visits to facilities to practise completing the Medicine Price Data Collection form	2–3 hours
Day 2	Debriefing on pilot testing and discussion on any revisions required to the Medicine Price Data Collection form	2–3 hours
	Allocation of data collectors to teams	3 hours
	Planning of regular team meetings	
	General review and questions	
	Review of supervisory role with all area supervisors (if appointed)	1 hour

to identify "natural leaders" who can assist other data collectors in case of difficulty. It will also enable realistic estimates to be made of the time required for collecting data at each study site.

Duration of training

As shown in Figure 5.1, at least two days will be required for training, including:

- Initial training: half day
- Pilot test: each survey pair should survey at least 10 medicines in both a public and private facility
- Debriefing on practical details of the survey: half day
- Allocation of data collectors into teams.

In addition, adequate time should be allocated for issues such as transport planning, paying travel advances and providing the Medicine Price Data Collection forms. When the survey is being undertaken for the first time, three days may be required for training to ensure that the data collectors are adequately prepared.

It is generally safest to train a few more data collectors than are needed in case any have to drop out of the survey.

PILOT TESTING

It is recommended that a pilot test should be conducted during the training of the data collectors. All aspects of the survey should be pilot tested, including the data collection process and the completion of the Medicine Price Data Collection forms.

The area supervisors should check the completed Medicine Price Data Collection forms to identify any inaccuracies or other problems that indicate the need for further action. They should then report their findings and recommendations to the survey manager to identify whether:

- Area supervisors or data collectors need further training to ensure the accurate collection of reliable information
- Revisions are needed to the core and supplementary lists of medicines on the Medicine Price Data Collection form
- Area supervisors or data collectors faced any constraints in sampling or in collecting data.

Any issues that may affect the quality of data collection must be addressed by the survey manager before the survey begins.

MEDICINE PRICE DATA COLLECTION FORMS

After the pilot test, the Medicine Price Data Collection forms should be reviewed and revised, if necessary: for example, the core and supplementary lists of medicines may need to be amended if a medicine is rarely available or is found only in a different dosage form and strength.

Each data collection team should be given a set of the revised Medicine Price Data Collection forms, preferably colour-coded for each sector.

Details of the facility should be added to the first page of each form by the area supervisor before the visit.

Arrangements should be made for the safe storage of completed forms from each sample site in secure conditions for an indefinite period in case any data need to be checked at a later date.

PLANNING THE SCHEDULE OF DATA COLLECTION VISITS

Before data collection starts, a schedule of visits should be prepared with the proposed dates for visits to each site. A written schedule should be provided for each data collection team.

The number of days required to collect the data can be estimated on the basis of the number of facilities to be visited in each geographical area, the distance between them and the mode of transport available.

In general, 1–2 hours plus travelling time will be required for data collection in each facility.

Making initial contact with health facilities

It is essential that good relations are established with the pharmacist/dispenser in each facility to be surveyed since they will have to set aside considerable time to provide information on the prices and availability of medicines. Area supervisors should visit them personally in advance to seek their permission for data collection in their facility or medicine outlet, avoiding peak periods when they may be busy

with patients. They should show them the letter of endorsement, but should *not* inform them about the specific medicines included in the survey. An appointment should be made for data collection to take place on a date and at a time that is convenient for the manager of each facility and medicine outlet.

This process may be time consuming, but it is important to invest in it since it will facilitate data collection.

LETTER OF INTRODUCTION

A letter of introduction from the survey manager will be invaluable in introducing area supervisors and data collectors to staff in the health facilities and pharmacies being surveyed. The letter of introduction should include the following information:

- The name of the organization conducting the survey and the contact details of the survey manager
- The purpose of the study
- The names of the data collectors who will visit the facility
- The time required for data collection in each facility.

The letter should also provide reassurance that the anonymity of the facility or pharmacy will be maintained.

An example of a letter of introduction is included as Annex 4 and is provided as a Word file on the CD-ROM for local adaptation, as appropriate.

It is advisable that data collectors should carry an identity document with a photograph, wherever possible.

CHECKLIST FOR AREA SUPERVISORS

Prior to going out into the field, the area supervisor must ensure that data collectors have the necessary tools and information with them. An example of a checklist for area supervisors is provided in Figure 5.2.

GUIDELINES FOR DATA COLLECTORS

Written guidelines should be provided for data collectors on the procedure to be followed during visits to health facilities and pharmacies. These should be developed by the survey manager and distributed to the data collectors by the area supervisors.

COORDINATING MEETINGS

As you plan, prepare, undertake the survey, enter the data, analyse and produce the survey report, you will need to meet regularly with your key team members. Schedule these meetings in advance.

Remember, the more you prepare, the smoother the survey will go.

Figure 5.2 Example of checklist for area supervisors

	Item
1	List of data collection teams
2	Contact details of the area supervisor and data collectors
3	Schedule of visits to survey sites
4	Contact details of the sites to be visited
5	Details of back-up facilities to be visited if scheduled visits are not possible or less than 50% of the medicines are available
6	Copies of letter of endorsement and letter of introduction for data collection team
7	Guidelines for data collectors
8	Examples of completed set of Medicine Price Data Collection form
9	Medicine Price Data Collection forms for each team of data collectors
10	Medicine Price Data Collection forms for each back-up site
11	Pens and other supplies
12	Field allowance for local expenses

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Data collection in the field

- Data collection must be accurate and reliable since it forms the basis for the remainder of the survey
- Data collectors will record data on the prices and availability of medicines
- Area supervisors should supervise data collectors and check completed Medicine Price Data Collection forms at the end of each day
- Area supervisors should calculate the unit prices of all available medicines.

FIELDWORK: AREA SUPERVISORS

Area supervisors are responsible for ensuring the accuracy and reliability of data collection. This involves the following activities.

Field supervision

Area supervisors should meet with the data collectors at the end of each day to get feedback on the data collection process and identify any problems. They should go out into the field regularly with the data collection teams to ensure that the agreed procedures are being followed. They should also return to randomly selected facilities or pharmacies to collect the same data and check the accuracy of the data collected earlier. Ideally, this validation should be performed for 10% of the facilities. Any problems that cannot be resolved in the field should be discussed with the survey manager.

Daily check of completed Medicine Price Data Collection forms

It is essential that area supervisors review completed Medicine Price Data Collection forms at the end of each day to check that the data are complete, consistent, and legible. Once the team has left the field, it becomes difficult to verify information that may be missing or incomplete.

The supervisors should highlight any missing or unreliable information on the form and identify the source of the problem. If necessary, data collectors should return to the facility to collect any further data required. The area supervisors should sign the first page of each form to record that it has been checked.

Calculating the unit prices of medicines

After checking the completed Medicine Price Data Collection forms, the area supervisors should calculate the unit prices of the medicines that have been found, using the following procedure.

1 For each product, divide the Price of Pack Found (Column G) by the Pack Size Found (Column F).

2 Retain at least four digits after the decimal point when calculating the unit price.

3 Enter the calculated unit prices in Column H of the form and double-check the calculations.

Storing completed Medicine Price Data Collection forms

Completed forms should be stored in waterproof plastic bags in the field.

FIELDWORK: DATA COLLECTORS

Preparation for fieldwork

Before going out into the field each day, data collectors should check that they have:

- Contact details of the area supervisor
- Schedule of visits to survey sites and contact details
- A copy of the letter of endorsement and letter of introduction
- Guidelines for data collectors
- A Medicine Price Data Collection form for each site to be visited and for each back-up site
- Pens: pencils should not be used to record data.

Data collectors should avoid visiting the facility in peak hours and should telephone before the visit, if possible, to confirm that the appointment is still convenient.

On arrival at the facility

On arrival at the health facility, pharmacy or other medicine outlet, data collectors should:

- Check that the information on the facility on the first page of the Medicine Price Data Collection form is complete and correct and inform the area supervisor if there are any inaccuracies
- Enter the following information on the first page of the Medicine Price Data Collection form:
  - Name(s) or codes of the data collector(s)
  - Name of the person in charge at the facility: e.g. the head of the hospital pharmacy, pharmacist, pharmacy owner or medicine outlet licence holder
  - Name of the person(s) who provided information on medicine prices and availability (if different from the person in charge).

Data collection

Information on prices and availability should be entered with the aid of the person in charge of the facility. The Medicine Price Data Collection form should *not* be left at a facility or pharmacy to be collected later with the promise that it will be filled in.

Completing the Medicine Price Data Collection form

Data collectors should complete a separate Medicine Price Data Collection form for each health facility, pharmacy and other medicine outlet. They should follow the procedure below.

Entering data

- Complete Row 3 for each medicine:
  - Enter the name of lowest price generic equivalent
  - Enter the manufacturer of lowest price generic equivalent

    Rows 2 and 3 for each substance can be identical, but the product in Row 1 can appear only in that row (see p. 55)
- Complete Columns D, E, F and, where appropriate, Column I
- Do not complete Column H; unit prices will be calculated by the area supervisor
- Do not enter data in any other rows or columns.

Dosage form

A medicine may be available in different dosage forms, including tablets/capsules, mixture/suspension, injection, cream/ointment and so on. Tablets and capsules are considered equivalent (except for nifedipine retard tablets). Column A lists the only dosage form on which information should be collected for a medicine. If the dosage form listed in Column A is not found, do not complete the row.

Strength

Column A lists the only strength on which information should be collected for a medicine. If the strength listed in Column A is not found, do not complete the row

Collect data only for the dosage form and strength listed in Column A. Note: for nifedipine, collect data only on the 20 mg retard formulation, in tablet form (see p. 31).

Column D: Available

Complete Column D for each medicine by ticking whether each of the following are available:

- Row 1: Innovator brand
- Row 2: Most sold generic equivalent
- Row 3: Lowest price generic equivalent.

Ask to see a pack of the product before recording that it is available.

In all sectors, there may be only one or two products for each medicine; if this is the case, enter information as follows:

- If there is no innovator brand, leave Row 1 blank
- If you find only one generically equivalent product, it will be both the most sold and the lowest price generic equivalent: enter the same information in Row 2 and Row 3 and note this in the 'Comments' column (Column I)
- If you find more than one generically equivalent product and the most sold generic equivalent also has the lowest price, enter the information for the most sold generic equivalent in both Row 2 and Row 3 and note this in the 'Comments' column (Column I).

If a product is temporarily out of stock:

- If price data are available, record the price and state that the product was out of stock in Column I: Comments
- If no price data are available, do not enter any data in the relevant row
- Do not substitute an alternative product.

If several medicines listed on the form are unavailable:

- Collect data for as many medicines as possible
- If less than 50% of the medicines on the form are available:
  - Visit an additional facility, identified in advance as a back-up, and conduct the survey again
  - Report the problem to the area supervisor.

Column F: Pack size found

In Column F for each medicine, enter the pack size actually found in the facility for:

- Row 1: Innovator brand
- Row 2: Most sold generic equivalent
- Row 3: Lowest price generic equivalent.

The pack size should be identical to the recommended size (Column E). If this is not available, select the closest, larger pack size found. Select the same pack size for innovator brand and generically equivalent products, whenever possible.

Collect the price for one pack size only for each medicine.

Column G: Price of pack found

In Column G, enter the price of the pack actually found, in the national currency for:

- Row 1: Innovator brand
- Row 2: Most sold generic equivalent
- Row 3: Lowest price generic equivalent.

Ask to see either the price list or price label on the product before entering the price on the form.

Record the price the patient pays. If part of the price is paid by insurance or other means, record the full price the pharmacist charges the patient. For instance, if the pharmacy is reimbursed 80% and the patient pays 20%, you should record the full price (100%).

Do not record "special discounts" (discounts available only to certain group of patients). However, you should record discounted prices if they apply to all patients. Add a note in the comments column.

In the public sector, medicines are often distributed free of charge or for a fixed fee for either the medicine or the visit:

- If medicines are distributed free or for a fixed fee, record the price the pharmacy/dispensary pays to its supplier
- If the patient pays a different price, record this price.

Column I: Comments

Column I can be used for explanatory comments or any additional information, such as:

- Product temporarily out of stock
- Percentage discounts offered.

Figure 6.1 shows an extract from a completed Medicine Price Data Collection form: Public Sector Patient Prices which has been completed by data collectors in the field. The unit prices have been entered by the area supervisor.

Figure 6.1 Extract from a Medicine Price Data Collection form: Public Sector Patient Prices, with data entered in the field

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recommended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Aciclovir tab 200 mg	Zovirax	GSK		25			/tab	*Not available*
Most sold generic equivalent				25			/tab	
Lowest price generic equivalent				25			/tab	
Amitriptyline tab 25 mg	Tryptizol	MSD		100			/tab	
Most sold generic equivalent	*Amitriptyline*	*Pharma*	✓	100	*1000*	*1261.00*	1.2610/tab	*Only 1 generic found*
Lowest price generic equivalent	*Amitriptyline*	*Pharma*	✓	100	*1000*	*1261.00*	1.2610/tab	
Amoxicillin caps/tab 250 mg	Amoxil	SKB (GSK)		21			/tab	
Most sold generic equivalent	*Amoxicillin*	*Ratiopharm*	✓	21	*500*	*3129.00*	6.2658/tab	*Only 1 generic found*
Lowest price generic equivalent	*Amoxicillin*	*Ratiopharm*	✓	21	*500*	*3129.00*	6.2658/tab	

Figure 6.2 shows an extract from a Medicine Price Data Collection form: Private Sector Retail Prices which has been completed by data collectors in the field. The unit prices have been completed by the area supervisor.

Checking the Medicine Price Data Collection form

Data collectors should check that the form is accurate and complete before leaving the facility and return completed forms to the area supervisor. They should report any problems as soon as possible.

Figure 6.2 Example of Medicine Price Data Collection form: Private Sector Patient Prices, with data entered in the field

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recommended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Aciclovir tab 200 mg	Zovirax	GSK	✓	25	*25*	*5392.70*	215.7080/tab	
Most sold generic equivalent	Acivir	Cipla	✓	25	*100*	*12396.90*	123.9690/tab	
Lowest price generic equivalent	*Virucid-200*	*Aegis*	✓	25	*25*	*1600.00*	64.0000/tab	
Amitriptyline tab 25 mg	Tryptizol	MSD		100			/tab	*Not available in country*
Most sold generic equivalent	Amitriptyline	Cosmos	✓	100	*100*	*80.00*	0.8000/tab	
Lowest price generic equivalent	*Amitriptyline*	*Cosmos*	✓	100	*100*	*80.00*	0.8000/tab	*Same as most sold*
Amoxicillin caps/tab 250 mg	Amoxil	SKB (GSK)	✓	21	*100*	*776.00*	7.7600/tab	
Most sold generic equivalent	Moxacid	Dawa	✓	21	*100*	*413.00*	4.1300/tab	
Lowest price generic equivalent	*Moximed*	*Medivet*	✓	21	*1000*	*3334.00*	3.3400/tab	

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Data entry

- Data entry and analysis will generally take place at central level
- The computerized Excel *WHO/HAI Medicine Pricing Workbook* that accompanies this manual is used to enter the data collected in the field, consolidate and summarize results, and print tables that will serve as the basis for reports
- The exchange rate must be entered in the International Medicine Reference Price Data page
- Medicine identification and medicine unit price data must be entered in the Field Data Consolidation Pages for Procurement, Public Sector, Private Sector or Other Sector Price Information
- The *Workbook* will automatically summarize and compare the data by sector and by medicine in the following pages:
  - Sector Availability and Price Summary
  - Medicine Availability and Price Summary
- The daily wage of the lowest paid unskilled government worker must be entered in local currency in the Standard Treatment Affordability page
- Additional data can be entered to complete supplementary analyses in the following pages:
  - Treatment Affordability by Sector
  - Price Composition: Cumulative Mark-ups
  - Price Composition: Components of Price
- You should have the *Workbook* open as you read this chapter.

USING THE COMPUTERIZED WORKBOOK

The specially-designed computerized *WHO/HAI Medicine Pricing Workbook* that accompanies this manual allows rapid entry and analysis of medicine price data. After data have been entered, the *Workbook* automatically generates summary tables that form the basis of data analysis.

You will find it helpful to run the *Workbook* for the first time while reading this chapter. If you have problems with the *Workbook* or discover any bugs, please send an e-mail message describing the problem with the problem file attached to Health Action International Europe (info@haiweb.org), which will try to respond promptly.

Getting started

1 Transfer the *Workbook* to your computer. You can do this by:
   - Copying the file from the CD-ROM that accompanies this manual
   - Downloading the latest file from the HAI website: (http://www.haiweb.org/medicineprices).

2 Start Excel and open the file *WHO-HAI Medicine Pricing Workbook.xls* that you copied onto your hard disk. Choose the option to "Enable Macros" as the file is opening.

3 Do not save data in the original *Workbook.* As soon as you open the file, save it with a filename that indicates the country and date of your survey. For example, you might choose a filename such as *SouthAfrica.May2003.xls*. In this way you retain a clean *Workbook* to use for future surveys.

Moving between *Workbook* pages

You can use either of two methods to move between pages.

1 Use the movement buttons. From the *Home Page*, click a button with the name of the desired page to go to that page. From any other *Workbook* page, click the **Go To Home Page** button to return to the *Home Page*.

2 Click on the tabs at the bottom of each page to move between pages of the *Workbook*.

Entering data

You can enter or edit data in any unshaded cell in a data entry form. Within the *Workbook,* all shaded areas are "protected" from entering data and other areas are "hidden" from view. These areas contain formulas or data that allow the *Workbook* to carry out its calculations automatically. Errors in the *Workbook*'s operation may result if you unprotect or reveal these areas. In order to guarantee the integrity of the calculations, these cells should not be modified.

Within each Field Data Consolidation page, a double-entry function is provided. While you do not have to use this feature, you are strongly advised to do so since this procedure will improve the accuracy of data entry. More details about double entry are given on pp. 69–70.

Ensuring accuracy

The quality of the information generated by the medicine price survey depends on the accuracy of data collection and data entry. The survey manager has overall responsibility for the quality of the data. The area supervisors and data entry staff should receive regular supervision. Attention to the details of supervision will pay off in the ease with which data entry and analysis occur.

The following steps will also help to ensure greater accuracy.

1 Establish procedures to check for data completeness, consistency, plausibility and legibility in the field when it is still possible to correct errors or to fill in missing information. The area supervisors should

review data collection forms every day after completion of the field work and resolve any problems before the next day of data collection.

2 Plan random checks to ensure the quality of data collection. The area supervisor should return to randomly selected facilities or pharmacies to collect the same data in order to check the accuracy of the data collected earlier. Ideally, this validation should be undertaken for 10% of the facilities.

3 Develop procedures for storing paper data collection forms safely and securely. Forms should be stored in waterproof plastic bags in the field and in secure filing cabinets or store rooms at the study office.

4 Identify the resources needed for data entry and checking *before* data collection begins and plan data processing carefully. Ideally data entry should take place at one site where the survey manager can supervise the process. Information on the Medicine Price Data Collection forms should be checked again for legibility and consistency during data entry.

Saving and backing up your work

Save the *Workbook* periodically as you work to prevent data loss in the event of power failure. Always make a back-up copy of the file on your hard drive or a CD-ROM after adding a substantial amount of data. Since Excel files write over the previous versions as they save, it is safest to retain intermediate versions under different file names.

OVERVIEW OF THE *Workbook* AND ITS OPERATIONS

The computerized *Workbook* consists of the following pages:

1 Home Page

2 International Medicine Reference Price Data

3 Field Data Consolidation: Medicine Procurement Prices

4 Field Data Consolidation: Public Sector Patient Prices

5 Field Data Consolidation: Private Sector Retail Prices

6 Field Data Consolidation: Other Sector Patient Prices

7 Sector Availability and Price Summary

8 Medicine Availability and Price Summary

9 Standard Treatment Affordability

10 Price Composition: Cumulative Mark-up

11 Price Composition: Components of Price

HOME PAGE

The top section of the *Home Page* contains a box with action buttons that are used to move to different parts of the *Workbook*. Click a button to jump to the page indicated.

The lower section of the *Home Page* contains a box with action buttons that allow you to erase previously entered data from the *Workbook*. It is generally easier to start a new survey by opening and renaming the original master *Workbook*. In some circumstances, however, it may be more efficient to erase parts of an existing *Workbook* to start a new survey: for example, if you have collected data on the same list of medicines from several provinces and use the same medicine lists, defined treatments and so on for each province.

Click on a button to erase data on a specific page or on the **Erase & Reset All Data** button to erase all data in the *Workbook*. After clicking the button, you will be prompted to confirm that you want to erase the data indicated. Once you confirm, all data you have entered on a page will be erased, so take care using this function.

Before erasing anything, you may want to save the entire *Workbook* under a separate file name as a back-up in case you need to return to it later.

INTERNATIONAL MEDICINE REFERENCE PRICE DATA PAGE

The International Medicine Reference Price Data page contains important information on the medicines in the survey that is used in subsequent pages. This page *must* be completed first, preferably during survey preparation. Figure 7.1 contains a picture of the page as it appears in the *Workbook*.

Figure 7.1 International Medicine Reference Price Data page

International Medicine Reference Price Data

Go To Home Page

MSH/Other Prices

Exchange Rate: $US 1.00 in local currency =	1.0000
Name of local currency:	
Date of exchange rate:	
Source of exchange rate:	
Source of Other Unit Price:	

	Med. No.	Medicine Name (Name must be unique)	Medicine Strength	Dosage Form	Target Pack Size	Core List (yes/no)	2002 MSH Unit Price ($US)	Other Unit Price ($US)	Price Data Used = MSH: Price of Target Pack ($US)	Price of Target Pack (local currency)	Reference Unit Price (local currency)
11	1	Aciclovir	200 mg	cap/tab	25	yes	$0.0854		$2.1350	2.1350	0.0854
12	2	Amitriptyline	25 mg	cap/tab	100	yes	$0.0070		$0.7000	0.7000	0.0070
13	3	Amoxicillin	250 mg	cap/tab	21	yes	$0.0178		$0.3738	0.3738	0.0178
14	4	Artesunate	100 mg	cap/tab	20	yes	$0.4942		$9.8840	9.8840	0.4942
15	5	Atenolol	50 mg	cap/tab	60	yes	$0.0082		$0.4920	0.4920	0.0082
16	6	Beclometasone inhaler	0.05 mg/dose	dose	200	yes	$0.0163		$3.2600	3.2600	0.0163
17	7	Captopril	25 mg	cap/tab	60	yes	$0.0264		$1.5840	1.5840	0.0264
18	8	Carbamazepine	200 mg	cap/tab	150	yes	$0.0193		$2.8950	2.8950	0.0193
19	9	Ceftriaxone injection	1 g/vial	gram	1	yes	$3.2468		$3.2468	3.2468	3.2468
20	10	Ciprofloxacin	500 mg	cap/tab	1	yes	$0.0357		$0.0357	0.0357	0.0357
21	11	Co-trimoxazole suspension	8+40 mg/ml	millilitre	70	yes	$0.0042		$0.2940	0.2940	0.0042
22	12	Diazepam	5 mg	cap/tab	100	yes	$0.0029		$0.2900	0.2900	0.0029
23	13	Diclofenac	25 mg	cap/tab	100	yes	$0.0043		$0.4300	0.4300	0.0043

1 At the top of the page (cell J3), you must enter the current **Exchange Rate** of your local currency in US dollars, which are the standardizing currency for these surveys. Once you have entered the exchange rate, you should not change it.

   Note that there may be a buying rate and a selling rate. In some countries, multiple rates may co-exist. For example, there may be an official rate, a commercial rate, and a parallel or "black market" rate. Use the commercial "buy" rate on the first day of the survey.

2 To document your decision, enter:
   - The name of your local currency (cell H4)
   - The date for which the exchange rate is valid (cell H5)
   - The source of the exchange rate you used (cell H6).

Medicine identifying information

The *Workbook* is supplied with a list of core medicines that should be monitored in all studies in order to facilitate international comparisons. The following data elements are already included in the *Workbook* for each medicine in the core list.

1 **Medicine Name**: Name (typically the INN or other generic name) of the target product. **These names must be unique for the *Workbook* to function properly.** If an additional product with the same generic name is to be included as a locally-selected supplementary medicine (see below), different names must be used. For example, if amoxicillin suspension is to be added as a supplementary medicine, it should be called "amoxicillin suspension" and the name of the core medicine should be changed to "amoxicillin capsule/tablet" to prevent confusion.

2 **Medicine Strength**: The strength of the target product, expressed as the number of milligrams or grams of active ingredient per dosage form (see item 3 below). Take special care in expressing the strength and dosage form of inhalers, injections and suspensions to prevent confusion in determining the unit price.

3 **Dosage Form**: The dosage form of the medicine for which the unit price is to be determined. The dosage form will most commonly be "cap" or "tab" for products administered as capsules or tablets. However, the dosage form may be:
   - Millilitre ("ml") for orally administered liquids and some injections
   - Gram ("g") or International Unit ("IU") for other injections
   - "Dose" for medicines administered through inhalers or nebulizers.

4 **Target Pack Size**: Different pack sizes are used in many countries and unit prices vary by pack size. Field data collectors should try to find a pack size identical to or larger than the target pack size. The Target Pack Size is not used in *Workbook* calculations and is included for reference purposes only.

5 **Core List (Yes/No)**: Selected from a drop-down list that identifies whether or not the medicine is on the core list. Core list medicines are marked "Yes". If you decide not to include one of the core list medicines in your survey (for example, because it is not available in your country), you can delete it from the list by deleting its name.

International reference prices

Reference prices are used to facilitate national and international comparisons. Summary measures of the medicine prices found during the survey will be expressed as ratios relative to a standard set of reference prices. The Management Sciences for Health (MSH) reference prices have been selected as the most useful standard. The MSH reference prices are the medians of recent procurement prices offered by not-for-profit suppliers to developing countries for multi-source generically equivalent products. These prices are available on the Web at http://erc.msh.org.

The 2002 MSH reference prices, which were current when this manual was produced, are already entered in the *Workbook*. Before entering any price data, find out if they are still current by checking the HAI website. If there is an updated version of the *Workbook* with more recent MSH reference prices, download it and use it for entering your survey data.

Note that these prices reflect the global wholesale prices of medicines from not-for-profit suppliers. The reliability of these reference prices generally depends on the number of suppliers quoting for each product.

If you have medicines on your supplementary list for which there are no MSH reference prices, you must use a different set of reference prices for *all* medicines on the core list and supplementary list. As an alternative, you might consider using the Australian Pharmaceutical Benefits Scheme (PBS) prices. These are the reimbursement prices that the Government of Australia has agreed to pay for the medicines it makes available in government-supported insurance programmes. These are generally among the lowest reimbursement prices paid in developed countries. The full list of PBS prices can be found on the Web at: http://www1.health.gov.au/pbs/index.htm.

The MSH and PBS reference prices were chosen as the recommended standards because they are updated frequently, are always available and are relatively stable. However, note that the two sources are quite different:

- MSH prices are wholesale not-for-profit procurement prices
- PBS prices are reimbursement (similar to retail) prices, including dispensing fee.

Many other reference price lists are now available and you may choose to use an alternative set of reference prices for your own purposes (see WHO Medicine Prices website at http://www.who.int/medicines). However, you should always add the name of the reference price in the *Workbook* and include the following information in the final report:

- The name of the reference price list you chose
- Your reasons for choosing it
- The date on which you obtained the price data from the list
- The dates for which the price list was reported to be valid.

Whatever reference price list is chosen, it is important to use the same reference price list for the entire list of medicines in your survey.

Before beginning data entry for your survey, you should enter or check the following reference price information for each of the core medicines.

6 **MSH Unit Price**: The median price of the target core medicine in the most recent MSH Medicine Price Indicator Guide. Even if another set of prices is being used for your national analyses, entering the most recent MSH prices will allow other countries to compare their data to yours.

7 **Other Unit Price**: If another set of reference prices is being used for the analysis, enter the appropriate unit price for each of the core medicines. Take special care to use the correct dosage form price for injections, inhalers and liquids. **Note that these prices need to be entered in US$ equivalents.** For example, if you use the PBS prices, you should convert them to $US equivalents or the comparisons in the *Workbook* that use these prices will not be correct. Enter the source of the unit prices you used in cell H7.

Once you have entered an exchange rate, unit prices and target pack sizes, the *Workbook* automatically calculates:

- **Price of Target Pack** (US$)
- **Price of Target Pack** (local currency)
- **Reference Unit Price** (local currency). The values in the Reference Unit Price (local currency) column are used in calculating the price ratios.

You can switch between the two different sets of reference medicine prices by clicking the **MSH/Other Prices** button at the top of the page.

Many *Workbook* calculations depend on the set of reference prices chosen. Switching reference prices will change the calculations. If you wish to obtain reports using both sets of prices:

1 Select the MSH prices.
2 Print all reports.
3 Switch sets of reference prices.
4 Print all reports a second time. All pages that depend on reference price indicate the source used.

Adding supplementary medicines

Up to 20 locally-defined supplementary medicines can be added to the pricing survey. If you wish to add supplementary medicines, you will need to enter the same identifying information as for those on the core list.

1 Enter the **Medicine Name** to be added in the next available empty row. Remember that each medicine name must be unique. After you press "Enter" or move away from the cell, the *Workbook* will automatically sort the medicine name you entered into alphabetical order.

2 Enter the **Medicine Strength**, **Dosage Form** and **Target Pack Size** as described on p. 62 for the core medicines.

3 In the **Core List** column, select "No" from the drop-down list to indicate that this is a supplementary medicine.

4 Enter the median **MSH Unit Price** for the medicine. Be sure to obtain the median supplier price per unit (e.g. per tablet or per millilitre) from the MSH price list.

5 If you plan to use a different set of reference prices for your national report, enter the **Other Unit Price** for the medicine.

Save the *Workbook* frequently as you work. Click on the **Go To Home Page** button when you have finished work on this page.

Removing medicines from the medicine list

To delete a medicine from either the core list or supplementary list in the *Workbook*, simply delete the medicine name. You will be prompted to confirm deletion of the medicine. If you confirm the deletion, all information about the medicine contained in the row will be deleted, and the empty row will be removed.

FIELD DATA CONSOLIDATION PAGES

There are four *Field Data Consolidation* pages in the *Workbook*, allowing price information from up to four sectors to be entered.

1 *Medicine Procurement Prices*

2 *Public Sector Patient Prices*

3 *Private Sector Retail Prices*

4 *Other Sector Patient Prices*: for example, prices from facilities in the NGO sector, the church mission sector or the defence sector.

These pages are used to enter unit price data collected in the field using the Medicine Price Data Collection forms. The sectors to be included in the survey should have been selected before data collection started in the field (see Chapter 3).

The lists of medicines on the *Field Data Consolidation* pages are derived directly from the *International Medicine Price Reference Data* page, which must be completed before data entry begins.

The unit prices entered on the *Medicine Procurement Prices* page should be prices from recent medicine orders, usually from public sector centralized medicine procurements.

For the *Field Data Consolidation* pages for the other three sectors, the prices entered will be the medicine-specific patient or customer charges that were collected at different facilities and medicine outlets in the survey.

Field Data Consolidation page sections

The *Field Data Consolidation* pages contain four sections. These sections can be displayed in different ways by use of the action buttons in the upper left corner of the page (described below). The sections of the page are:

1 **Medicine list**: This list (columns A–C) is generated automatically from the medicines listed on the *International Medicine Price Reference List* page. The list contains three rows for the three different types of prices obtained in the field for each medicine:
   - Row 1: Innovator brand
   - Row 2: Most sold generic equivalent
   - Row 3: Lowest price generic equivalent.

2 **Summary ratios by medicine**: This section has five columns (columns D–H). These compare different summary measures that describe the distribution of unit prices entered for each medicine with the medicine's reference unit price.

   The five summary ratios that describe the distribution of unit prices are:
   - Median: i.e. the median of the unit prices entered divided by the reference unit price
   - 25th percentile
   - 75th percentile
   - Minimum
   - Maximum.

   The *Medicine Procurement Prices* page also computes (in column I) the total number of procurement prices (orders) entered for each medicine.

   The other three *Field Data Consolidation* pages compute the percentage availability of each medicine, based on the number of unit prices entered divided by the total number of outlets or facilities in the survey.

   At the top of the summary ratio section is a blue area in which you enter (cell G10) the minimum number of unit prices required for each medicine in order for summary measures to be computed:
   - A single procurement price may be sufficient
   - A minimum of four unit prices should be obtained from different public health facilities or medicine outlets for the other three sectors.

3 **Data entry grid:** An empty data grid in which you enter information about:
   - The source of each column of unit price data (Rows 7–9)
   - The unit prices found for each medicine (Rows 12–161).

   The *Medicine Procurement Prices* page allows you to enter up to 10 sets of procurement prices for each medicine. To identify each set, you specify:
   - An arbitrary **Procurement ID** (Row 7)
   - The **Procurement Agency** (Row 8)
   - The **Procurement Date** (Row 9).

   The other three *Field Data Consolidation* pages allow you to enter data from up to 60 public health facilities, private pharmacies and other medicine outlets. For each set of prices, you specify:
   - An arbitrary **Medicine Outlet Study ID** (Row 7)
   - A code for the **Region** where the outlet was located (Row 8)

- A measure of **Distance From Population Centre** (Row 9), which allows you to classify facilities as urban or rural.

4 **Summary table:** A table that summarizes the results in each sector across all medicines in the survey for all the summary measures. The measures in the summary tables are explained in detail in Chapter 8.

Figure 7.2 on p. 68 shows part of the empty data entry section for the *Field Data Consolidation: Private Sector Retail Prices* page with the summary ratios section displayed, while Figure 7.3 shows the empty summary table for that page.

Action buttons

Each *Field Data Consolidation* page has a set of action buttons at the top that control the way the page is displayed. There are four buttons in the upper left corner (see Figure 7.2):

- **Go To Home Page** button.
- **Data/Summary** This button causes the page to display either the data grid or the summary table. When the summary table is displayed, all the action buttons in Row 5 are hidden.
- **Ratios On/Off** This button reveals or hides the columns that contain the summary ratios (Columns D–I). Turning off the summary ratios simplifies the process of data entry by displaying a greater number of data columns.
- **Double Entry** Once data from the field have been entered the first time, clicking this button displays a menu that allows you to carry out the three steps required for double data entry. These steps are described on pp. 69–70.

In addition to the page display buttons, there are four action buttons at the top of the data entry grid (Columns K–O) that allow you to sort the columns in the grid from left to right according to the identifying information entered in Rows 7–10. Sorting will allow you to select certain subsets of the data for analysis (see Chapter 8). You can sort the columns on the *Medicine Procurement Prices* page by:

- **ID** (Row 7)
- **Agency** (Row 8)
- **Date** (Row 9)
- **Number** (Row 11, the default sort order).

You can sort the columns on the other three *Field Data Consolidation* pages by:

- **ID** (Row 7)
- **Region** (Row 8)
- **Distance** (Row 9)
- **Number** (Row 11, the default sort order).

To the right of the data sorting buttons (at the top of Column Q–S), there is one additional action button. During data analysis (described in Chapter 8), you can choose to limit analysis to selected medicine orders (on the *Medicine Procurement Prices* page) or selected outlets (on the other *Field Data Consolidation* pages) by changing the "1"s in Row 10 to "0"s for all outlets to be excluded from analysis. The **Include All** button restores all the orders or outlets to the analysis by replacing all "0"s with "1"s.

Figure 7.2 Part of the data grid from the *Field Data Consolidation: Private Sector Retail Prices* page

	A	B	C	D	E	F	G	H	I	J	K
1		Field Data Consolidation:									
2		Private Sector Retail Prices									
4		Go To Home Page	Data/Summary								
5		Ratios On/Off	Double Entry							Sort by:	ID
6										Data for Individual	
7		Medicines Outlet Study ID		Summary Comparisons to Reference Prices and Percent Availability in Outlets							
8		Region									
9		Distance From Population Centre									
10		Include outlet in analysis (1=yes,0=no)?		(Blank if found in <			4	outlets)		1	1
11	No.	Medicine Name	Medicine Type	Median (MPR)	25%ile	75%ile	Min	Max	% with med.	1	2
12	1	Aciclovir	Brand								
13	1	Aciclovir	Most sold								
14	1	Aciclovir	Lowest price								
15	2	Amitriptyline	Brand								
16	2	Amitriptyline	Most sold								
17	2	Amitriptyline	Lowest price								
18	3	Amoxicillin	Brand								
19	3	Amoxicillin	Most sold								
20	3	Amoxicillin	Lowest price								
21	4	Artesunate	Brand								
22	4	Artesunate	Most sold								
23	4	Artesunate	Lowest price								

Figure 7.3 Summary table from the *Field Data Consolidation: Private Sector Retail Prices* page

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Field Data Consolidation:											
2		Private Sector Retail Prices											
4		Go To Home Page	Data/Summary										
165													
166		Describe outlets included in this summary:											
167													
168													
169		Private Sector Medicines Outlets (n=0 in survey)								Core Meds./All Meds.			
170		Includes Core Medicines Only (n=30 on list)											
171										Analysis Includes Only Medicines			
172		Analysis Includes All Meds.								With Prices Found for Both Types in Pair			
173			Brand	Most Sold	Lowest Price		Brand	Most Sold	Brand	Lowest Price	Most Sold	Lowest Price	
174		Overall Percent Availability of Medicines on List in Outlets Included in Analysis											
175		Median availability											
176		25 %ile availability											
177		75 %ile availability											
178		Number of Listed Medicines For Which Prices Were Found in 4+ Outlets											
179		No. of meds. included	0	0	0		0	0	0	0	0	0	
180		Summary of Medicine-specific Median Price Ratios (MPRs) For Meds. Found in 4+ Outlets											
181		Median MPR											
182		25 %ile MPR											
183		75 %ile MPR											
184		Minimum MPR											
185		Maximum MPR											
186													
187		Reference Price Data Used = MSH											

How to enter data

All the *Field Data Consolidation* pages use the same procedures for entering data. The following steps describe how to enter data on the *Private Sector Retail Prices* page.

1 Use the action buttons on the *Home Page* to switch to the *Private Sector Retail Prices* page.

2 If the summary table is displayed, click on the **Data/Summary** button to switch to the data entry grid.

3 If Columns D–I are visible, click on the **Ratios On/Off** button to hide them.

4 Enter the identifying information for the first medicine outlet:
- Enter the **Medicine Outlet Study ID** in Cell J7
- Enter the **Region** code in Cell J8
- Enter the **Distance from Population Centre** in Cell J9. Distance should be entered as the approximate number of kilometres from the medicine outlet to the largest population centre in the region.

5 Starting at Cell J12 and proceeding down the column, enter the unit prices for each of the medicines in the list. You have calculated unit medicine prices in Column H of the Medicine Price Data Collection form. The unit medicine prices should always be entered in local currency.

6 Repeat steps 4–5 for each private sector retail outlet included in the survey, using Columns K–BQ. You can enter data for up to 60 outlets.

To protect against data loss, save the *Workbook* periodically throughout the data entry process and again when data from all medicine outlets have been entered.

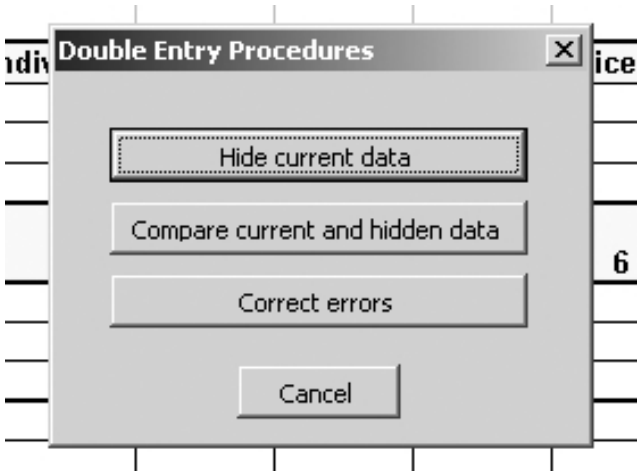
After medicine unit prices from at least four medicine outlets have been entered for a given medicine, summary statistics for the medicine will be calculated in Columns D–I. You can view these summary statistics at any time by pressing the **Ratios On/Off** button.

Double entry procedures

Entering detailed data such as long columns of the unit prices of medicines can lead to substantial numbers of errors. The quickest and most efficient way to find these data entry errors is to have a second person enter all data a second time and then identify where the numbers entered disagree. The *Workbook* contains a set of procedures to lead you through this process. Pressing the **Double Entry** button will display the menu of double entry procedures, as shown in Figure 7.4. The functions of the four action buttons on the menu are described below.

- Step 1: **Hide Current Data** Pressing this button will copy all the data in the data entry grid to a hidden part of the *Workbook*; the data in the data grid will then be erased. The identifying information for the facilities or outlets will remain in Rows 7–9 to ensure that the same columns are used for the second round of data entry.

Figure 7.4 Menu of double entry procedures



- Step 2: **Compare current and hidden data** After you complete the second round of data entry, pressing this button will generate an automatic comparison of the data entered in the second round with the data entered in the first (hidden) round. Any cells that do not agree will be highlighted in red. If there are no errors, all the cells in the data entry grid will remain clear with no red cells.
- Step 3: **Correct errors** Once any errors have been identified and highlighted in red, you can return to the original data collection forms to determine the correct values. Pressing this button will make the *Workbook*:
  - Proceed one by one through the highlighted errors
  - Display a window that shows both the first and second values entered
  - Allow you to enter and save the final value to be used.

  Ideally the survey manager should make all final determinations about ambiguous data values.
- **Cancel** Pressing this button will exit the double entry menu without making any changes.

STANDARD TREATMENT AFFORDABILITY PAGE

The *Standard Treatment Affordability* page defines standard treatments and expresses the costs of the treatments in terms of:

- Median treatment prices (using the median unit prices of the brand, most sold generic or lowest price generic equivalent products from each sector)
- The number of days' wages of the lowest paid government worker (useful for inter-country comparisons).

Ten standard treatments, for nine conditions, have been entered on this page (see Figure 4.8, p. 43 for the list of medicines and conditions).

If your survey did not include one of these medicines, Columns H to O will be blank. You can replace it with another medicine from the core or supplementary

list (see below). In addition to the ten standard treatments, space is provided to enter two further standard treatments using survey medicines.

The standard treatment chosen would usually be one locally defined for a target condition by the Ministry of Health, a professional association or an expert panel. If there are no locally-defined standard treatments for a condition you wish to include in the affordability analyses, you can use a standard treatment defined by an international organization such as WHO or BNF.

Standard treatments would be entered as follows:

- Acute conditions: full courses of therapy
- Chronic conditions, where therapy continues indefinitely: monthly courses of therapy.

Click on the **Treatment Affordability** button on the *Home Page* to move to the *Standard Treatment Affordability* page. There is space to analyse the affordability of up to 12 standard medicine treatments. To define standard treatments:

1 First, in Cell J6 enter the daily wage of the lowest paid government worker in local currency. (See p. 29 for a description of how to obtain this figure.)

To define new standard treatments:

2 Enter the name of the standard treatment to be defined in Cell B68 (overwriting the default text "Enter Condition"). Type the name of a selected condition and press "Enter".

3 Enter in Cell B70 the **Medicine Name** of the medicine used in the standard treatment. The medicine must be one included in the survey. The easiest way to enter the medicine name is to move the cursor into the cell and click on the selection arrow that appears to the right of the cell. You will then see an alphabetical list of all medicine names in the survey. Use your mouse or the arrow keys to select the medicine that you want on the list, and click on it. Alternatively you can type in the medicine name, but the spelling must be *exactly* the same as the name of a medicine on the medicine list. After a medicine name is entered, the **Medicine Strength** and **Dosage Form** will appear automatically in Columns C–D.

4 In Column E, enter the **Treatment Duration**, which is number of days for a typical course of therapy. For a chronic disease for which a medication is taken daily, this would be 30 (to define a monthly treatment), while for acute illnesses it would be the total duration of therapy.

5 In Column F, enter the **Total # of Units per Treatment**, which is the number of units of the medicine that would be given for the treatment duration that you specified. For example, for omeprazole 20 mg, the treatment duration might be 30 days and the number of units per treatment might be 30 (capsules).

6 After the Medicine Name and the Total # of Units per Treatment have been entered, the *Workbook* automatically calculates the **Median Treatment Price** in local currency for each sector for all three medicine types based upon the median unit prices of the data that you collected.

It also expresses the treatment price in terms of **Days' Wages** for the wage rate specified in step 1.

7 Repeat steps 2–5 for additional treatments you wish to define. Further space is provided, starting in Cell B74. Alternatively, you can replace one (or more) of the preselected treatments that were not surveyed (Columns H–O will be blank). In this case, you will be overwriting the name of the condition, Medicine Name, Treatment Duration and Total # of Units per Treatment.

If a particular treatment requires more than one medicine, you can enter the same treatment name in more than one block of data and enter the information in separate blocks for the different medicines required. In reporting the Median Treatment Price and Days' Wages for this condition, you would need to add together the information from all medicines to get totals for the treatment.

Be careful when entering the units required for liquids, injections, or inhalers. Note that for inhalers the unit is a single dose of inhalant, not the number of inhalers. This would mean that you need to calculate and enter the total number of doses required in a month in the Total # of Units per Treatment. Expressing the dose of combination products can also be confusing. For co-trimoxazole, the medicine unit is written as 8+40 mg/ml. The treatment regimen might be 2 doses of 5 ml per day for 7 days, which would amount to 70 ml (2 doses x 5 ml x 7 days) for the total treatment course.

PRICE COMPOSITION: CUMULATIVE MARK-UPS PAGE

The *Price Composition: Cumulative Mark-ups* page allows you to enter manufacturers' ex-factory package prices for packs of a given size. It then generates information about how that price compares to an international reference price as well as the overall mark-up over the manufacturer price in different sectors. Click on the **Price Composition: Mark-ups** button on the *Home Page* to move to the *Price Composition: Cumulative Mark-ups* page.

1 In Cell B7, enter the **Medicine Name** of the target medicine from the survey. As on the *Standard Treatment Affordability* page, the easiest way to enter the medicine name is to move the cursor into the cell, click on the selection arrow to the right and select the medicine that you want from the list displayed. The medicine name can also be typed in, but the spelling must be *exactly* the same as the name on the medicine list. After a medicine name is entered, the **Medicine Strength** and **Dosage Form** will appear automatically in Columns C–D.

2 For each sector included in the survey, enter in Columns G, H and I the **Manufacturer Pack Price** and the **Manufacturer Pack Size** (expressed as the number of dosage forms) found in that sector for the brand, most sold and lowest price items. The *Workbook* then calculates the **Manufacturer Unit Price (MUP)** and the **Ratio of Manufacturer Unit Price to reference unit price**.

In addition, the **Sector Median Unit Price (SMUP)** found for the sector is inserted from the *Field Data Consolidation* pages and **% Mark-up of Sector Median Unit Price over Manufacturer Unit Price** is calculated. Note that this mark-up figure may include many components such as

taxes, duties and fees, as well as wholesale and retail mark-ups. These different components are dealt with in the following *Price Composition: Components of Price* page.

The sector-specific mark-ups can be calculated for up to ten different medicines from the survey by repeating steps 1–2 for each medicine.

PRICE COMPOSITION: COMPONENTS OF PRICE PAGE

On the *Price Composition: Components of Price* page, the final page in the *Workbook*, you can enter information about the different types of duties, charges, or mark-ups that are applied to up to twelve medicines as they proceed from the manufacturer to patient purchase in different sectors. If all medicines face the same structure of duties, charges and mark-ups, you would need to enter only one medicine. However, if different types of medicines face different duties (e.g. originator medicines versus generic medicines, or imported medicines versus locally manufactured medicines) in different sectors, you may wish to enter several examples.

To get to the page, click on the **Price Composition: Components** button on the *Home Page*.

1 In Cell D6, enter a description of the type of medicine whose components of price you will detail, and the sector (or sectors) to which these components of price apply.

2 In Cell B9, enter the first **Medicine Name** using the drop-down list or typing in an exactly spelled name as you have done for the two previous sheets. The *Workbook* automatically inserts the **Medicine Strength**, **Dosage Form** and **Target Pack Size** in the next three columns.

3 For charges and mark-ups that are percentages, any quantity can be used as the base for calculations. However, some charges, such as dispensing fees, may be charged as fixed fees when a medicine is dispensed. For this reason, the components of price will be entered and calculated in relation to a dispensed quantity of medicines rather than a target pack size, which may contain more than the dispensed amount.
   - In Column F, enter the typical **Dispensed Quantity** of the target medicine to be used as the base for calculations.
   - In Column J, enter the CIF (ex-factory) **Price of Dispensed Quantity** of this medicine when it is sold in the target pack size. This price can be calculated as the dispensed quantity divided by the size of the target pack times the price of the target pack.

4 In Column G, enter descriptions of all the different **Types of Charge** that are added to the CIF price of the medicine as it moves through the delivery system. These charges might include:
   - Port clearance charges
   - Stamp duties or other duties
   - Wholesale and/or retail mark-ups (as allowable or actual percentages)
   - Packing fees

- Various other levies: for example in Sri Lanka, a defence levy was charged on all items at the time of the study
- Taxes (sales or VAT)
- Dispensing fees.

There may be different charges for the public or private sectors, so you would use a second example to enter them. Be sure to enter the types of charge in the order in which they are levied, since percentage charges will be compounded on totals from previous charges

5 For each of the types of charge entered in Column G, indicate in Column H the **Charge Basis**: either percent or fixed fee. Use the drop-down function to enter the type of charge that applies.

6 In Column I, enter the **Amount of Charge**.

If the charge is a percentage, enter the amount as a percentage (e.g. "2.5%" or "0.5%"), not a decimal. Be sure to include the percent sign.

If the charge is a fixed amount, enter this in local currency using numbers and decimals. Using the charge data entered, the *Workbook* then calculates the **Price of Dispensed Quantity** and the **Cumulative % Mark-up**.

A hypothetical example illustrating the entry of data for the components of price analysis for a medicine is shown in Figure 7.5.

Figure 7.5 Hypothetical example of price components analysis

	A	B	C	D	E	F	G	H	I	J	K
1		**Price Composition: Components of Price**									
2											
3											
4		Go To Home Page									
5											
6		**Describe sector and type of medicine:**		Most sold generic version of amoxicillin in private sector purchases							
7											
8		**Example 1: Medicine Name**	**Medicine Strength**	**Dosage Form**	**Target Pack Size**	**Dispensed Quantity**	**Type of Charge**	**Charge Basis**	**Amount of Charge**	**Price of Dispensed Quantity**	**Cumulative % Mark-up**
9		Amoxicillin	250 mg	tab	100	21	Cost, insurance, freight (CIF) price	NA	NA	44.94	0.00%
10							Port clearance	percent	3.0%	46.29	3.00%
11							Import tax	percent	8.0%	49.99	11.24%
12							Stamp duty	percent	1.1%	50.54	12.46%
13							Wholesale mark-up	percent	15.0%	58.12	29.33%
14							VAT	percent	11.0%	64.52	43.56%
15							Dispensing fee	fixed fee	5.0	69.52	54.69%
16											
17											
18											
19											
20											

Note that if you have entered reasonable amounts for the various charges and mark-ups, the final unit price of the dispensed quantity of the example medicine should be approximately equal to the median unit price you observed for this medicine in this sector when collecting data in the field.

8

Data analysis and interpretation

- Four main types of data analysis are possible:
  - Price and availability comparisons within any one sector
  - Price and availability comparisons between different sectors
  - Treatment affordability
  - Price composition
- The *Workbook* automatically generates summary tables which compare the median prices from your survey with international reference prices
- The summary tables provide the evidence base for your report
- This chapter shows how to examine, summarize and print your survey data
- It also makes suggestions on how to interpret and report your findings
- You should have the *Workbook* open as you read this chapter.

Once the price data collected during the survey have been entered into the *Workbook*, they can be used for different types of analyses. You can use the summaries calculated automatically by the *Workbook* to analyse:

- Medicine price levels and variations in different sectors, geographical areas, medicine types and individual medicines
- Treatment affordability in relation to the daily wage of the lowest paid government worker
- Components of the prices of medicines paid by purchasers and consumers.

To carry out these analyses you will need to:

- Examine and compare summary results on medicine availability, median price and price variation:
  - By sector
  - Across sectors
  - For different medicines
- Examine overall treatment cost and affordability of standard treatments for important clinical conditions in the sectors for which price data were collected

- Compare the final purchase prices for example medicines in different sectors with import or manufacturers' prices when these medicines entered the market, and detail subsequent charges and mark-ups that contribute to the final price in different sectors.

OVERVIEW OF DATA ANALYSIS

The *Workbook* simplifies the process of analysing data from the medicine pricing survey. Once price data have been entered, automated summary tables compare median prices:

- With standard reference prices across different product types: innovator brand, most sold generic and lowest price generic equivalents
- In different sectors (procurement prices, public sector patient charges, private retail prices, and patient charges in NGO/other facilities).

The median prices are also used to examine key aspects of treatment affordability and medicine price composition.

Types of data analysis

The data in the pricing survey can be used for many different types of analyses at both the national and international levels. This chapter focuses on national-level analysis. There are four basic types of analyses at the national level:

1. **Within-sector analyses:** Analyses of data from a single sector include examining:
   - Median medicine price levels in relation to international standard prices
   - Variations in price across medicine procurements or medicine outlets
   - Comparisons between innovator brand and generically equivalent products
   - Product availability in medicine outlets.
2. **Cross-sector comparisons:** Overall medicine availability and prices can be compared between the different sectors for which price data were collected in the survey, both for individual medicines and median price ratios across medicines.
3. **Treatment affordability:** Using standardized treatment regimens for key health problems, affordability can be expressed in terms of treatment cost for an episode of illness, as well as the number of days' wages of the lowest paid government worker required to pay for the cost of treatment.
4. **Price composition:** Price composition analyses include:
   - Comparing final patient prices to ex-factory prices for a set of medicines in different sectors
   - Examining the different charges and mark-ups that contribute to final price.

Other types of analysis, such as comparisons by region or distance, are possible from the data in your *Workbook*.

Before starting analysis, you should define the analyses and summary tables that you will include in the survey report, assign appropriate personnel to each task and prepare a time schedule for outputs. This will help to prevent delays in writing up and releasing results. In countries with inflation, fluctuating currency exchange rates or unstable prices, data need to be analysed and presented quickly to ensure their relevance.

Understanding reference prices

The use of standard international reference prices facilitates comparisons of price levels between sectors and across countries by providing a measurement against which prices can be compared. By default, the reference prices used in the *Workbook* are international not-for-profit supplier/tender prices listed in the International Medicine Price Indicator Guide published by Management Sciences for Health (MSH). However, you can choose to use another set of reference prices for your analyses or switch between the two sets.

It is important to emphasize that MSH reference prices are *international not-for-profit supplier/tender prices*, not retail prices. While centralized procurement prices or patient charges in public sector facilities may be fairly close to the MSH prices, private retail prices and patient charges in other sectors (e.g. NGO or private hospitals) are likely to be considerably higher. This is due to the charges and profits added on to the procurement price of a medicine as it proceeds through the distribution system. The extent to which these retail prices are higher depends on the country and situation. If a medicine is rarely used, the price differential is likely to be greater. Under some circumstances, medicines sold in private sector outlets may cost as much as 100 times the MSH price or more. For medicines with very large price differentials, your price component analyses may reveal why the prices are so high.

Printing Summary Tables

Before starting analysis, you should print out the raw data you have entered for each sector (medicine unit prices in local currency) in the Field Data Consolidation pages. This will allow you to make a visual check that your data are broadly correct and contain no obvious mistakes.

All pages in the *Workbook* are set up so that the relevant sections will print in a convenient format when you use the Excel print functions. To see how a printed page will appear, first go to the page using the buttons on the *Home Page*. For a *Field Data Consolidation* page, be sure that the summary table and not the data grid is displayed.

To preview how the page will look, you can:

- Press the Print Preview icon () if it appears in the tool bar on the top of your Excel screen or
- Select File-Print from the Excel main menu, and press the **Preview** button when the print pop-up window appears.

Depending on your paper size and printer setup, you may need to adjust page margins so that all columns in a summary table appear together on the same page. Once you are satisfied with the layout, you can print the table by:

- Using the Excel print icon () or
- Pressing **OK** from the Print pop-up window.

Selecting subgroups for analysis

National analyses using the complete sample of field data are the primary focus of the pricing survey. However, you may also wish to assess or compare prices in different subgroups within a sector. For example, you may wish to compare prices in outlets from different regions, or outlets in urban versus rural areas, or procurements by the central Ministry of Health versus regional procurement agencies. To allow subgroup analyses, the *Field Data Consolidation* pages permit you to exclude selected columns of data from analyses.

By default, analyses in the *Workbook* include all the columns of data you enter. To make it easier to exclude certain columns, the *Field Data Consolidation* pages allow you to sort procurements or outlets (left to right) by variables you entered as identifying information (see Chapter 7). For the *Medicine Procurement Prices* page, these identifying variables are:

- ID number
- Procurement agency
- Procurement date.

For the other *Field Data Consolidation* pages, the variables are:

- ID number
- Region
- Distance from the nearest population centre.

Pressing the **Number** button returns to the original sort order.

Selecting subgroups

To select subgroups, first sort the data (left to right) by any identifying variable to make it easier to find the columns to exclude. Changing the "1"s in Row 10 to "0"s will exclude the columns from calculations. For example, Figure 8.1 shows prices from public sector outlets that have been sorted by region; in this example, all outlets except those in the North region have been excluded. If you were interested in the effect of distance, you could sort by distance and exclude all columns above or below a target distance. To include columns again, either change the "0"s back to "1"s, or press the **Include All** button.

Figure 8.1 Selecting subgroups of outlets for analysis

	A	B	C	J	K	L	M	N	O	P	Q	R
1	Field Data Consolidation:											
2	Public Sector Patient Prices											
4	Go To Home Page	Data/Summary										
5	Ratios On/Off	Double Entry		Sort by:	ID	Region	Distance	Number				Include All O
6				Data for Individual Medicines Outlets (Enter Medicine Unit Prices in Local Currency)								
7	Medicines Outlet Study ID			C	F	K	O	B	D	G	N	A
8	Region			East	East	East	East	North	North	North	North	South
9	Distance From Population Centre			1	1	1	9	6	2	15	12	21
10	Include outlet in analysis (1=yes,0=no)?			1	1	1	1	1	1	1	1	1
11	No.	Medicine Name	Medicine Type	3	6	11	15	2	4	7	14	1
12	1	Aciclovir	Brand		15.0574		14.1615			14.1467	14.164	14.1838
13	1	Aciclovir	Most sold		4.6037		4.1723			4.1626	4.1742	
14	1	Aciclovir	Lowest price				2.987			3.8134		
15	2	Amitriptyline	Brand									
16	2	Amitriptyline	Most sold				19.62			18.15	19.88	
17	2	Amitriptyline	Lowest price				19.62			18.15	19.88	

Comparing subgroups

To compare subgroups, first select the columns corresponding to one subgroup and print out the summary table. Then change the selection and print out the summary table for a different subgroup. On all summary tables, you are provided with a space to describe the sample of data included in the analysis. Be sure to complete this description before printing. You can then compare different subgroups as you write your report.

Final word on data quality

The rest of this chapter explains how to use the *Workbook* to perform several different analyses of medicine prices and how to interpret and report the results.

Errors in data collection, processing or entry may cause substantial errors in summary results.

If the prices for one or several medicines appear to be quite different, you should first check to be sure that the difference is not due to error. One common error is incorrect calculation of the unit price. For example, the price of an entire 200 dose inhaler may have been entered in some data collection forms instead of the unit price of a dose of inhalant. Ideally, most errors will be caught during data processing, but surprising findings should be checked once again for errors during data analysis and reporting.

DATA ON THE NATIONAL PHARMACEUTICAL SECTOR

In order to present some of the context within which your survey was conducted, the survey includes the National Pharmaceutical Sector form (Annex 2 and on the CD-ROM) to record basic descriptive information on your country's health care system and pharmaceutical sector. These data are not used in any of the actual price analyses, but they can be helpful for explaining or interpreting findings. The completed electronic form should be included as an annex to your report.

There are no specific procedures for analysing the data on the health care system and the pharmaceutical sector. In an introductory section, it may be useful to provide a brief overview of these data organized according to the different sections on the data collection form. You may want to add additional information to your summary on topics not included on the form to help readers understand the survey setting and results.

WITHIN-SECTOR PRICE ANALYSES

Each survey can accommodate price data from up to four sectors, although not all sectors need to be defined for a given survey. The *Workbook* automatically produces analyses both within and between whichever sectors have been defined. The possible sectors include:

1 **Medicine Procurement Prices**: Procurements would usually be conducted by centralized public sector agencies, but data can also be included from other public and private procurement systems.

2 **Public Sector Patient Prices**: In some countries, patients pay for medicines in public sector health facilities, often at subsidized prices, and these charges can be examined in this sector. Even if patients do not pay for medicines, this sector can also be used to examine medicine availability at public facilities.

3 **Private Sector Retail Prices**: These prices usually come from a sample of private retail pharmacies and other types of medicine outlet, although private retail pharmacies at health facilities might also be included in some settings.

4 **Other Sector Patient Prices**: This sector can be defined in various ways to examine patient charge data from different care systems, including mission or NGO hospitals, military hospitals and community revolving medicine funds.

Although entry of the medicine price data from all four sectors is quite similar (see Chapter 7), the analysis of medicine procurement price data differs somewhat between the analysis of patient charge data and the other three sectors. The following sections describe both types of analysis.

Analysing medicine procurement price data

The *Field Data Consolidation: Medicine Procurement Prices* page is used to enter medicine procurement price data: i.e. the amounts paid by large purchasing agencies to obtain medicines from suppliers. Usually the purchasing agency will be the central Ministry of Health purchasing unit although, in some countries, there are regional public purchasing units or pooled purchasing systems that supply medicines to NGO hospitals.

You may choose to enter and summarize prices from a single medicine order only. However, the *Workbook* allows entry of up to ten different sets of procurement data from different points in time or from different purchasing agencies. In your report, remember to identify clearly the purchasing agency or agencies and the period of time over which the procurements took place.

These procurement data may be the only public sector price data available in systems where medicines in the public sector are distributed to patients at no charge or for a fixed fee per medicine or per visit. If the fee that patients pay varies by medicine or type of medicine, those variable fees should be entered in the *Field Data Consolidation: Public Sector Patient Prices* page and analysed separately.

Examining summary statistics on procurement prices for individual medicines

After all the procurement prices collected during the survey have been entered into the *Workbook*, you can begin analysis by examining the summary ratios for individual medicines. These summary ratios appear on the *Field Data Consolidation* pages in Columns D–I. If they are not visible, press **Ratios On/Off** to reveal them.

Figure 8.2 shows an example of the summary ratios for a few medicines after all procurement data have been entered. Column D contains the median price ratio (MPR) for individual products, which is the median procurement price observed for each medicine divided by its international reference price (IRP). The median price ratio for procurement data is a measure of purchasing efficiency.

In general, procurement prices for the most sold and lowest price generically equivalent products should be fairly close to the MSH international supplier/ tender prices (that is, ratios up to 1.00). If the medians of the median price ratios (median MPRs) are 20% above or below the MSH prices (i.e. ratios up to 1.20), the procurement system is working very efficiently. The median price ratios for innovator brand products may be much higher, since the MSH international reference prices are prices for products procured in generically equivalent form. The difference between the median price ratio for an innovator brand product and the median price ratio for its lowest price generic equivalent is a measure of the "brand premium" paid for purchasing innovator brand products.

Begin analysis by examining the median price ratios:

- Across medicines
- Across products within a medicine.

In the example table in Figure 8.2, the median price ratios (MPR) for ciprofloxacin are between 26.20 and 39.29, which is a sign that this procurement system is not obtaining very competitive prices. For co-trimoxazole suspension, the median price ratio for the innovator brand version is many times higher than the most sold or lowest price generically equivalent versions (that is, there is a very high brand premium); for the other medicines, the innovator brand prices are somewhat closer.

When there are multiple procurement prices for each medicine (the number of orders for each medicine is shown in Column I), you should also examine the range between the 25th and 75th percentiles and between the Minimum and Maximum to see if there are wide variations in procurement prices across orders. In the example, the ratios across orders are reasonably stable. However, for some products (e.g. innovator brand ciprofloxacin or generic co-trimoxazole suspension), the price on at least one order was very much lower than the typical price. You should examine such outliers carefully to see if they are errors. If not, finding out how a low price was obtained in one order may point to ways to make the procurement process more efficient.

Figure 8.2 Example of medicine-specific summary procurement statistics

	A	B	C	D	E	F	G	H	I	J	K
1		Field Data Consolidation:									
2		Medicine Procurement Prices									
4		Go To Home Page	Data/Summary								
5		Ratios On/Off	Double Entry							Sort by:	ID
6										Data for Procureme	
7	Procurement ID			Summary Comparisons to Reference Prices						A	B
8	Procurement Agency			and Number of Orders per Medicine						MOH	MOH
9	Date (Mon-YY as in Jan-02)									Jan-02	Feb-02
10	Include order in analysis 1=yes,0=no)?			(Blank if med. has <			1	orders)		1	1
11	No.	Medicine Name	Medicine Type	Median (MPR)	25%ile	75%ile	Min	Max	# orders	1	2
36	9	Ceftriaxone	Brand	4.86	4.86	4.86	3.24	4.87	8		108.6796
37	9	Ceftriaxone	Most sold	2.92	2.85	2.99	2.78	3.06	2		93.16397
38	9	Ceftriaxone	Lowest price	2.71	2.62	2.80	2.54	2.88	2		85.14276
39	10	Ciprofloxacin	Brand	39.29	39.20	39.37	26.29	39.58	10	22.10729	14.8358
40	10	Ciprofloxacin	Most sold	33.64	33.64	33.64	33.64	33.64	1		
41	10	Ciprofloxacin	Lowest price	26.20	26.20	26.20	26.20	26.20	1		
42	11	Co-trimoxazole suspension	Brand	20.71	20.41	20.77	13.59	22.45	9		44.44268
43	11	Co-trimoxazole suspension	Most sold	3.81	3.50	3.84	2.34	4.63	10	11.40894	7.655847
44	11	Co-trimoxazole suspension	Lowest price	3.18	2.70	3.72	1.99	3.84	10	8.028572	6.49056

In your report, you may want to highlight examples where there are large differences observed between the median price ratios for different types of products or where the range of procurement prices varies widely across orders.

Producing a summary table of procurement price data

While data on the prices of individual medicines can be revealing, the main purpose of the survey is to analyse the "typical" prices paid for an entire set of medicines, both within and across sectors. Each *Field Data Consolidation* page in the *Workbook* automatically creates a summary table that contains statistics calculated across medicines from the median price ratios in Column D. The five summary measures calculated are:

- Median (mid-point) median price ratio of the medicines on the list
- 25th percentile median price ratio
- 75th percentile median price ratio
- Minimum median price ratio
- Maximum median price ratio.

To produce and print the summary table on the *Medicine Procurement Prices* page, carry out the following steps.

1. If the data entry grid is displayed on the page, click on the **Data/Summary** button to make the summary table visible (as shown in Figure 8.3).
2. In Cell F166, enter a description of the procurements that are included in this analysis, including the procurement agency and range of dates.
3. Decide whether you would like to display summaries only for the core survey medicines (i.e. the set of 30 medicines recommended for

Figure 8.3 Example of summary table containing procurement price data

Field Data Consolidation: Medicine Procurement Prices

Go To Home Page | Data/Summary

Describe procurements in this summary: National public medicine procurements for 2001

Medicines Procurements (n=10 in survey) — Core Meds./All Meds.

Includes Both Core and Non-Core Medicines (n=30 on list)

	Analysis Includes All Meds. With 1+ Procurement Prices			Analysis Includes Only Meds. With 1+ Procurement Prices for Both Types in Pair					
	Brand	Most Sold	Lowest Price	Brand	Most Sold	Brand	Lowest Price	Most Sold	Lowest Price
Number of Medicines For Which 1+ Procurement Prices Were Found									
No. of meds. included	23	21	19	17	17	18	18	18	18
Summary of Medicine-specific Median Price Ratios (MPRs) For Meds. With 1+ Procurement Prices									
Median MPR	8.96	5.63	4.41	12.23	5.63	14.30	4.03	6.80	5.84
25 %ile MPR	3.69	3.17	2.95	5.46	2.92	5.86	2.83	3.08	2.83
75 %ile MPR	25.48	17.10	12.25	31.97	11.90	31.54	11.26	17.57	12.68
Minimum MPR	0.33	1.76	1.61	1.84	1.76	1.84	1.61	1.76	1.61
Maximum MPR	84.68	38.32	34.51	84.68	38.32	84.68	34.51	38.32	34.51

Reference Price Data Used = MSH

international comparisons) or for all the medicines that you have studied in the survey, both core and supplementary. Click **Core Meds./All Meds.** to shift between the two sets of medicines.

4 Examine the summary table to be sure the data look sensible. Investigate any values that look unusual to check they are not based on errors. After previewing the printed version of the summary table (as described above), print the table and use it as the basis for your report.

Interpreting the procurement price data summary table

First, note the table headings. The first heading contains data on the number of different sets of procurement prices included in the survey. If only one set of procurement prices has been entered, this heading would read "Medicine Procurements (n=1 in survey)".

The next heading describes the medicines that are included in the table, either core medicines only or all medicines (both core and supplementary). The heading calculates the number of medicines listed on the *International Medicine Reference Price* page that fall in whichever of these two categories has been selected. Note that the set of reference prices used for comparisons (MSH or an alternative set of prices) is indicated at the bottom of the table.

The third row of headings describes the two different types of summary data contained in the table. On the left of the table are three columns of data summarizing the median price ratios for medicines which had the minimum number of procurement prices (usually 1). These three columns are for the three product types (innovator brand, most sold and lowest price generic equivalents). The first row of data in this section shows how many medicines of each product type had the minimum number of procurement prices reported. In the example table, for the 30 medicines in the survey, 23 innovator brand products had at least 1 procurement price, while only 21 most sold and 19 lowest price generic equivalents had at least one price.

The bottom section on the left calculates the five different summary measures from the median price ratios for included medicines. In the example table, the median of the median price ratio across the 23 innovator brand products for which prices were found was 8.96, while the 25th and 75th percentiles of the median price ratios for these medicines were 3.69 and 25.48 respectively.

Obviously, if prices were found for nearly all of the medicines within each product type, the summary statistics on the left side of the table will be fairly representative and comparisons across the three product types will be valid. However, if prices for all medicines were not found, and especially if different medicines were found for each product type, it is more valid to use the data in the six columns on the right side of the table. On the right side, only medicines that "match" are included; that is, each pair of columns limits analysis to medicines with prices for both of the product types in the pair. In the sample table, 17 matching medicines were found for the comparison between innovator brand and most sold generic medicines, while 18 pairs were found for each of the other two comparisons: innovator brand versus lowest price generic equivalent and most sold versus lowest price generic equivalent. Unfortunately, if few pairs of prices are found in a particular survey, the comparisons are less likely to be representative of the broader medicine pricing situation in this sector. For government procurement data, you may well find that a high percentage of prices are found only for lowest price generically equivalent products, since the government may not purchase innovator brands.

Reporting summary results on procurement prices

The data in this table can be used to explore how efficiently the procurement system is working. If the median of the median price ratio is much lower than 0.80, then (after checking your data for errors) congratulate your procurement officer. If the median of the median price ratio for generic products is very high, you should investigate the reasons. Reasons for high price ratios in comparison to international reference prices may include:

- Patent protection on innovator brand items
- Lack of generic competition
- Generic medicines priced by suppliers only slightly below the innovator brand
- Small quantities being procured
- Lack of transparency in procurement
- Inefficiency in procurement
- Lack of price regulation.

Your survey will give you data to start such an assessment.

In your report, you should try to describe the overall situation regarding the number of medicines procured and the levels and variability of the median price ratios that you found for each product type. To the extent that product types have enough common medicines to be compared, you should also compare median price ratios across product types.

If a reasonably high percentage of products "matched" across sectors, then you should base analyses on the right "paired" side of the table since these provide fairer comparisons. You interpret these paired summaries in a similar way as the unpaired ones on the left side, but you should explain that the statistics are for matched pairs.

Analysing patient price and medicine availability data

Three *Field Data Consolidation* pages are used to summarize price data gathered from the different types of facilities or medicine outlets that you included in your survey. You can use the same approaches to summarize and analyse data from each of these pages. The analysis process will be described in detail below using example data from a set of 20 private sector retail pharmacies. Simply adapt and repeat this approach to analyse data from the *Public Sector Patient Prices* or the *Other Sector Patient Prices* pages.

Examining summary statistics on patient prices for individual medicines

As with the procurement price data, you should begin analysis of patient price data by examining the summary statistics that appear in Columns D–I for individual medicines. Figure 8.4 shows an example of these summary statistics after all price data for a sample of 20 private sector pharmacies and medicine outlets have been entered. The median price ratio in Column D is equal to the median medicine price to patients across the included outlets divided by the medicine's international reference price. For patient price data, the median price ratio measures the magnitude of price mark-up to end-users.

Begin analysis by examining the median price ratios:

- Across medicines
- Across product types.

Figure 8.4 Example of medicine-specific summary medicine price statistics

	A	B	C	D	E	F	G	H	I	J	K
1		Field Data Consolidation:									
2		Private Sector Retail Prices									
4		Go To Home Page	Data/Summary								
5		Ratios On/Off	Double Entry							Sort by:	ID
6										Data for Individual I	
7	Medicines Outlet Study ID			Summary Comparisons to Reference Prices and Percent Availability in Outlets						A	B
8	Region									South	North
9	Distance From Population Centre									0	0
10	Include outlet in analysis (1=yes,0=no)?				(Blank if found in <		4	outlets)		1	1
11	No.	Medicine Name	Medicine Type	Median (MPR)	25%ile	75%ile	Min	Max	% with med.	1	2
33	8	Captopril	Brand	12.45	12.38	12.62	12.29	13.05	100.0%	3.7914	3.6733
34	8	Captopril	Most sold	5.01	4.94	5.12	4.90	5.23	95.0%	1.5214	1.5
35	8	Captopril	Lowest price	4.25	4.19	4.38	4.15	4.42	60.0%	1.2894	
36	9	Ceftriaxone	Brand	6.94	6.94	7.00	6.90	7.01	55.0%	232.87	
37	9	Ceftriaxone	Most sold						0.0%		
38	9	Ceftriaxone	Lowest price						0.0%		
39	10	Ciprofloxacin	Brand	56.21	55.99	56.49	55.52	56.87	90.0%	31.6634	31.953
40	10	Ciprofloxacin	Most sold						0.0%		
41	10	Ciprofloxacin	Lowest price						0.0%		
42	11	Co-trimoxazole suspension	Brand	29.34	29.11	29.44	28.90	29.83	60.0%	96.68	
43	11	Co-trimoxazole suspension	Most sold	5.01	4.99	5.16	4.89	5.50	85.0%	17.83	17
44	11	Co-trimoxazole suspension	Lowest price	4.96	4.87	5.14	4.64	5.42	85.0%	16.99902	16.902

Note that the summary ratios for a product will be blank if fewer prices than the minimum number specified in Cell G10 were found. Unlike procurement prices, there are no easy rules of thumb for determining if the median price ratios for patient prices are high, low or about right. A median price ratio of 2.00 would mean that the final price of the product to a patient (after all intermediate charges and distribution costs) was two times the international price. Generally, the median price ratios for innovator brand products will be higher since the international reference prices are for generically equivalent products; this measures the innovator "brand premium" paid for purchasing innovator brand products.

In the example table, the median price ratios vary from moderately high (e.g. 4.25 for lowest price generic captopril, 4.96 for lowest price generic co-trimoxazole suspension) to very high (e.g. 56.21 for innovator brand ciprofloxacin, 29.34 for innovator brand co-trimoxazole suspension). This indicates that the relative prices charged to patients for different medicines are not uniform when compared to international prices. Examining either high or low prices may uncover interesting medicine-specific factors that are helping to determine price. Very large innovator brand premiums like that for co-trimoxazole suspension (29.34 median price ratio for innovator brand vs. 4.96 for lowest price generic equivalent) are worth noting.

You should also examine the range between the 25th and 75th percentiles and between the minimum and maximum to see if there are wide variations in patient prices in different outlets. In the example, the price ratios for the four medicines shown appear to be quite stable in the 20 pharmacies included in the survey, with no dramatic differences between the 25th and 75th percentiles. You should examine outliers carefully to see if they are errors. If not, finding out why some outlets charge lower or higher prices may point to strategies to lower price in this sector.

In your report, you may want to highlight specific examples where there are large differences observed between the median price ratios for different types of products or where the range of prices that patients pay varies widely across outlets.

Producing a summary table of patient price data

Focusing too much on the observed price levels and differentials for individual medicines can be misleading. The main purpose of the survey is to analyse the "typical" prices that patients pay for an entire set of medicines. The summary table of patient prices, which you can access by clicking the **Data/Summary** button, contains statistics calculated across medicines from the medicine-specific median price ratios in Column D. As for procurement prices, the five summary measures calculated are:

- Median (mid-point) median price ratio of the medicines on the list
- 25th percentile median price ratio
- 75th percentile median price ratio
- Minimum median price ratio
- Maximum median price ratio.

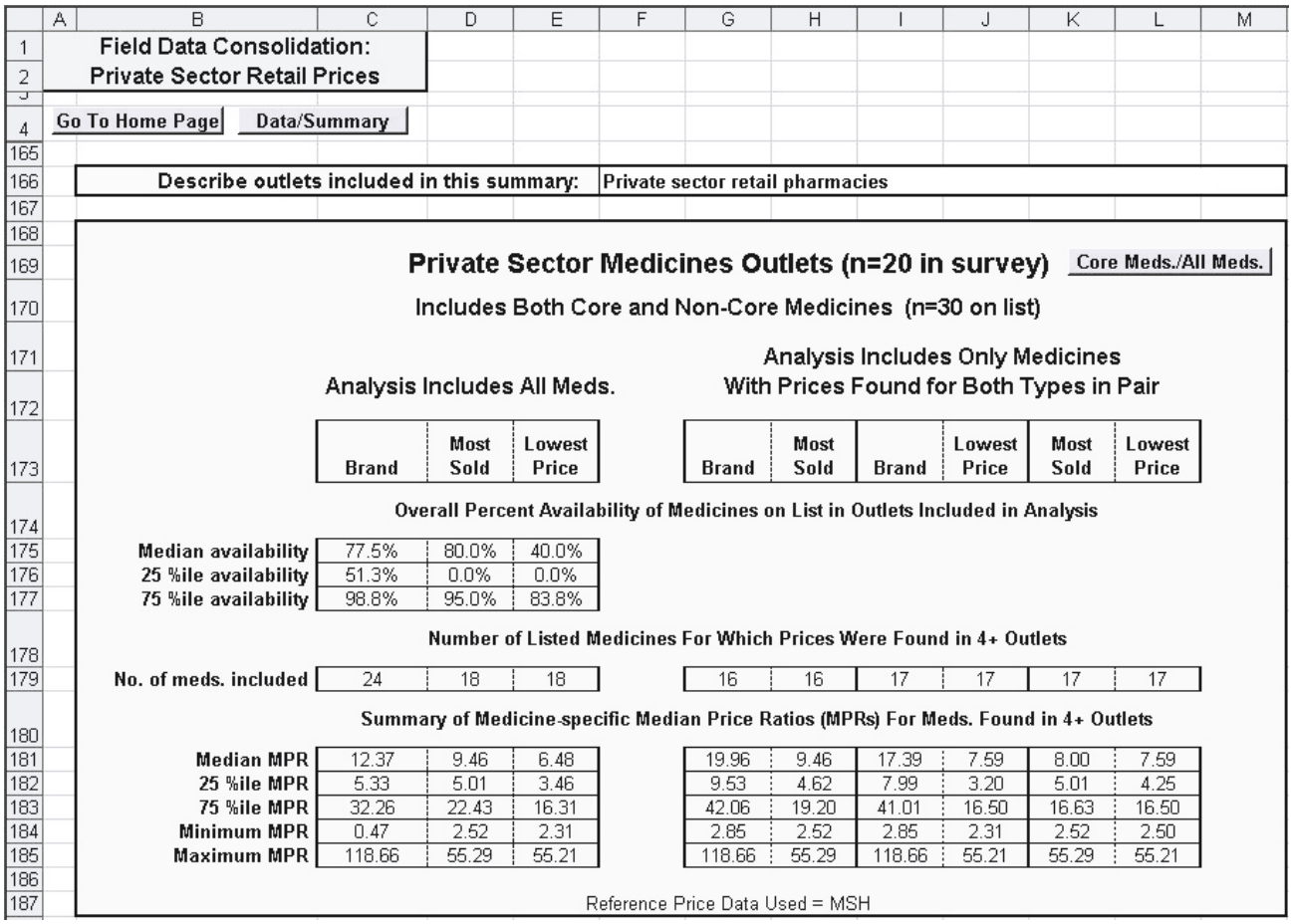
You can produce and print the summary tables for patient prices by following the same steps outlined for the summary procurement price table in the previous section. Remember to enter a description of the outlets included in the analysis for each sector in Cell F166 before printing. Clicking the **Core Meds./All Meds.** button will switch between a summary of medicines on the core list and a summary of the entire list of medicines (core and supplementary) included in your survey. Generally, your national report would be based on your entire list of medicines, although comparisons with surveys in other countries should be based on the core list to increase the validity of the comparisons.

Interpreting a patient price data summary table

Figure 8.5 shows an example of a summary table for patient price data for 20 pharmacies in the private sector. The structure of the table summarizing patient price data is similar to the summary table for procurement price data described above. The first table heading indicates the sector and the number of medicine outlets included in the summary, while the second heading indicates whether the summary covers core medicines only or all medicines surveyed, along with the number of such medicines in the reference list. The set of reference prices used in the analysis is indicated at the bottom of the table.

As with the procurement price summary, the main body of the table has two sides. On the left of the table are three columns of data summarizing the findings for medicines that had the minimum number of prices (usually four) found in the outlets included in the analysis. The three columns are for the three product types (innovator brand, most sold and lowest price generic equivalent). If the minimum number of prices was found for a low percentage of medicines, and especially if different medicines were found for each product type, it is more valid to use the data in the six columns on the right side of the table. On the right side, only medicines that "match" are included in comparisons between product types: that is, each pair of columns limits analysis to medicines that had prices for both product types in the pair.

Figure 8.5 Example of summary table containing patient price data



Field Data Consolidation: Private Sector Retail Prices

Go To Home Page | Data/Summary

Describe outlets included in this summary: Private sector retail pharmacies

Private Sector Medicines Outlets (n=20 in survey) Core Meds./All Meds.

Includes Both Core and Non-Core Medicines (n=30 on list)

	Analysis Includes All Meds.			Analysis Includes Only Medicines With Prices Found for Both Types in Pair					
	Brand	Most Sold	Lowest Price	Brand	Most Sold	Brand	Lowest Price	Most Sold	Lowest Price
Overall Percent Availability of Medicines on List in Outlets Included in Analysis									
Median availability	77.5%	80.0%	40.0%						
25 %ile availability	51.3%	0.0%	0.0%						
75 %ile availability	98.8%	95.0%	83.8%						
Number of Listed Medicines For Which Prices Were Found in 4+ Outlets									
No. of meds. included	24	18	18	16	16	17	17	17	17
Summary of Medicine-specific Median Price Ratios (MPRs) For Meds. Found in 4+ Outlets									
Median MPR	12.37	9.46	6.48	19.96	9.46	17.39	7.59	8.00	7.59
25 %ile MPR	5.33	5.01	3.46	9.53	4.62	7.99	3.20	5.01	4.25
75 %ile MPR	32.26	22.43	16.31	42.06	19.20	41.01	16.50	16.63	16.50
Minimum MPR	0.47	2.52	2.31	2.85	2.52	2.85	2.31	2.52	2.50
Maximum MPR	118.66	55.29	55.21	118.66	55.29	118.66	55.21	55.29	55.21

Reference Price Data Used = MSH

The first section of data in the table summarizes overall medicine availability in the private retail pharmacies included in the analysis. Three summary measures are reported:

- Median availability
- 25th percentile availability
- 75th percentile availability.

These are all calculated from the medicine-specific values labelled **% with medicine** in Column I in Figure 8.4. (Note that all medicines are included in the statistics in this first section regardless of how many times they were found.) In the example table, median availability differs substantially by product type. Of the 30 medicines for which prices were sought, the median availability of innovator brand products was 77.5%, with half of the medicines found in between 51.3% and 98.8% of outlets. In contrast, generic medicines were less frequently available. For the most sold generically equivalent products, median availability in these outlets was 80.0%, while median availability of other lower price generic alternatives was only 40%. More than a quarter of the generic products were not found in any of the outlets (i.e. 25th percentile is 0.00).

The next section of data in the table shows how many medicines of each product type obtained the minimum number of prices in the outlets included in the analysis. Of the 30 core and locally-defined medicines in the survey, 24 innovator brand products were found in at least four private sector retail pharmacies (of the 20 in the analysis), while only 18 most sold and 18 lowest price generically equivalent products were found this frequently. Because of the low percentage

of generic products meeting the minimum of four prices and the large differences in the medicines that were found for each product type, the data on the right side of the table are preferable when making direct comparisons between product types. For paired comparisons in the example, both innovator brand and most sold generically equivalent products were found the minimum number of times for 16 medicines, while "matches" were found 17 times for the innovator brand versus most sold generic equivalent and most sold versus lowest price generic equivalent comparisons.

The final section of the table summarizes the median price ratios found in Column D of Figure 8.4. In the sample table, the median of the median price ratio across the 24 innovator brand products for which prices were found was 12.87, but was quite variable (25^{th} and 75^{th} percentiles = 5.33, 32.26). On average, the most sold generic equivalent (median = 9.46, $25^{th\%}$ and $75^{th\%}$ = 5.01, 22.43) and lowest price generic equivalent (median = 6.48, $25^{th\%}$ and $75^{th\%}$ = 3.46, 16.31) were much less expensive, but the prices relative to international reference standards also varied across medicines. Limiting analysis to medicines for which matching prices were found (on the right side of the table), innovator brand products were over twice as expensive as their most sold generic equivalents (19.96/9.46), and 2.3 times as expensive as lowest price generic equivalents (17.39/7.59). Buying the lowest price generic product would save an average of 5% compared to the most sold generic equivalent (comparing 8.00 and 7.59).

Reporting summary results on patient prices

The data in this table can be used to explore whether patients are paying reasonable prices for medicines in this sector and how much they would save by purchasing generically equivalent products. Because there are no easy rules of thumb for determining a "reasonable" price, you should be cautious in your conclusions about price levels. However, medians of the median price ratios much greater than 2.00 for generically equivalent products would generally be cause for concern, since this is twice the price of these medicines if procured by international tender.

If the median of the median price ratio for generically equivalent products seems high, you should investigate the reasons. Some possible reasons for high patient prices are similar to those for high procurement prices:

- Innovator brand patent protection
- Lack of generic competition
- Suppliers of generic medicines pricing popular products only slightly below the innovator brand version.

Additional reasons might include:

- Excessive manufacturer profits
- High government taxes and duties on medicines
- Inefficient supply system
- Excessive and variable wholesale or retail mark-ups.

Your survey will give you data to start such an assessment.

In your report, you should try to describe the overall situation regarding product availability, and the levels and variability of the median price ratios that you found for each product type. To the extent that product types have enough common medicines to be compared, you should also compare median price ratios across product types.

CROSS-SECTOR PRICE AND AVAILABILITY COMPARISONS

After looking individually at each sector for which price data were collected, the next stage in the analysis of the pricing survey is to compare results across sectors, drawing contrasts between procurement data and whichever sectors of patient data were included in the survey. It will be informative to analyse both relative price levels (both procurement and patient prices) and product availability (in medicine outlets).

As for within-sector analyses, there are two different types of cross-sector analysis:

- Comparisons of the results for individual products
- Comparison of the sector summary results.

There are two separate pages in the *Workbook* that automatically prepare summary tables for these two types of analysis.

Individual medicine price comparisons

Begin cross-sectoral analysis by using the **Summary: Medicine Comparison** button on the *Home Page* to go to the *Medicine Availability and Price Summary* page. This page is divided into two sections. The left side contains results on medicine availability for each surveyed medicine (Figure 8.6), while the right side contains medicine-specific median price ratios (Figure 8.7 on p. 90). The data in this table are identical to the information in Columns I and D in the summary ratio sections of the individual *Field Data Consolidation* pages. They are collected here for easy comparison. Both sections will automatically print in order when you use the Excel print functions described above.

Interpreting medicine availability and price summaries

In this summary, medicine availability results are displayed for the three sectors for which prices were collected from medicine outlets, while price results also

Figure 8.6 Example of summary comparing medicine-specific availability across sectors

	A	B	C	D	E	F	G	H	I	J	K	L
1		Medicines Availability and Price Summary										
2												
3												
4												
5												
6				Medicines Availability in Outlets								
7												
8				Brand			Most Sold			Lowest Price		
9		Medicine Name	Core List (yes/no)	Public (n=18)	Private (n=20)	Other (n=9)	Public (n=18)	Private (n=20)	Other (n=9)	Public (n=18)	Private (n=20)	Other (n=9)
10		Aciclovir	yes	77.8%	100.0%	66.7%	72.2%	95.0%	55.6%	44.4%	75.0%	33.3%
11		Amitriptyline	yes	88.9%	100.0%	44.4%	100.0%	90.0%	88.9%	100.0%	100.0%	88.9%
12		Amoxicillin	yes	83.3%	85.0%	66.7%	72.2%	100.0%	77.8%	55.6%	40.0%	11.1%
13		Artesunate	yes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
14		Atenolol	yes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15		Beclometasone inhaler	yes	83.3%	95.0%	88.9%	94.4%	95.0%	88.9%	94.4%	95.0%	88.9%
16		Captopril	yes	88.9%	100.0%	66.7%	83.3%	95.0%	66.7%	44.4%	60.0%	0.0%
17		Carbamazepine	yes	21.2%	85.0%	66.7%	83.3%	90.0%	77.8%	44.4%	75.0%	0.0%
18		Ceftriaxone injection	yes	55.6%	55.0%	22.2%	5.6%	0.0%	0.0%	5.6%	0.0%	0.0%
19		Ciprofloxacin	yes	100.0%	90.0%	88.9%	5.6%	0.0%	0.0%	5.6%	0.0%	0.0%

Figure 8.7 Example of summary comparing medicine-specific median price ratios across sectors

	B	C	M	N	O	P	Q	R	S	T	U	V	W	X
1	**Medicines Availability and Price Summary**													
2														
3														
4														
5														
6			**Medicines Median Price Ratios (MPRs) in Procurements and Outlets**											
7			*(Reference Price Data Used = MSH)*											
8			**Brand**				**Most Sold**				**Lowest Price**			
9	**Medicine Name**	**Core List (yes/no)**	**Pro-cure-ment (n=10)**	**Public (n=18)**	**Private (n=20)**	**Other (n=9)**	**Pro-cure-ment (n=10)**	**Public (n=18)**	**Private (n=20)**	**Other (n=9)**	**Pro-cure-ment (n=10)**	**Public (n=18)**	**Private (n=20)**	**Other (n=9)**
10	Aciclovir	yes	12.23	17.37	17.39	17.36	3.62	5.12	5.64	5.11	3.41	4.86	5.06	
11	Amitriptyline	yes	43.14	64.82	64.67	61.87	19.46	27.17	27.17	24.26	17.29	26.67	27.14	24.26
12	Amoxicillin	yes	16.37	22.61	22.61	22.47	7.98	10.95	10.92	10.85	7.28	9.98	10.32	
13	Artesunate	yes												
14	Atenolol	yes												
15	Beclometasone inhaler	yes	3.76	5.37	5.39	5.36	1.76	2.53	2.52	2.51	1.61	2.36	2.50	2.51
16	Captopril	yes	8.96	12.45	12.45	12.36	3.57	5.01	5.01	4.94	3.28	4.25	4.25	
17	Carbamazepine	yes	4.32	3.81	5.22	5.11	3.57	5.01	5.01	4.94	3.28	4.25	4.25	
18	Ceftriaxone injection	yes	4.86	6.94	6.94		2.92				2.71			
19	Ciprofloxacin	yes	39.29	56.09	56.21	56.08	33.64				26.20			

contain median price ratios for the procurement sector. There are several aspects to evaluate during your analysis.

For the availability summaries, first look for availability issues for individual medicines to highlight in your report. For example, in the example, no artesunate or atenolol was found in any outlets, and the overall availability of ceftriaxone is quite low. These examples may point to policy or supply system issues that can be addressed to improve availability.

Next, examine the median price ratio data for issues to highlight. In your report, you may want to give examples of medicines that have particularly high (e.g. ciprofloxacin or amitriptyline in Figure 8.7) or low (e.g. beclometasone inhalers or ceftriaxone) median price ratios in all sectors. Alternatively, you can highlight examples of medicines that have a particularly high innovator brand premium in all sectors (e.g. aciclovir). Again, these examples may lead to insights into how the medicine supply system is working.

Sector-wide comparisons

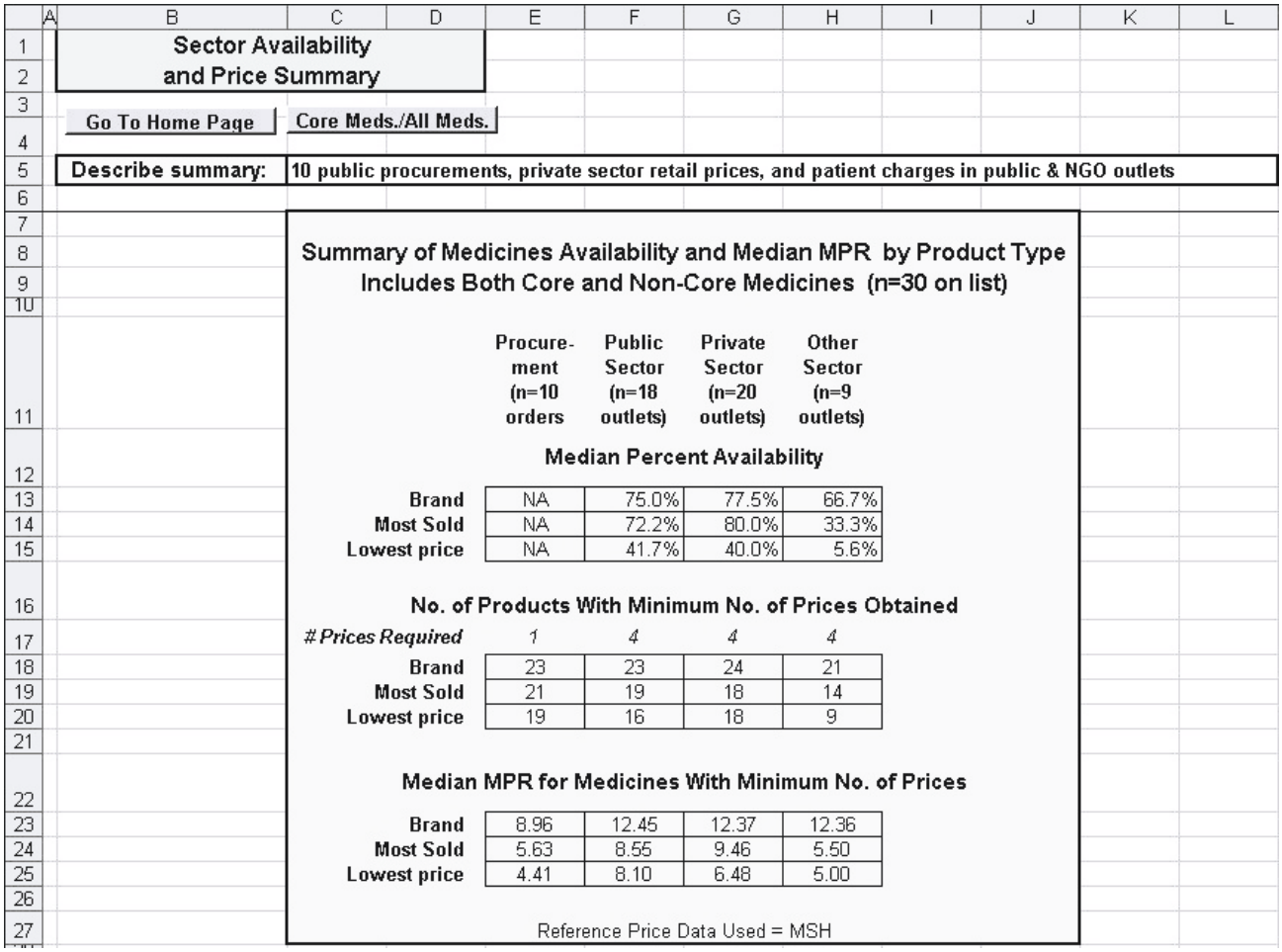
To compare summary medicine availability and price results across sectors, click the **Summary: Sector Comparison** button on the *Home Page*. This will bring you to the *Sector Availability and Price Summary* page. Note that you can use the **Core Meds./All Meds.** button to switch between analyses that report on core medicines only and on all core and supplementary medicines.

There are two summary tables on the page. The first contains:

- Overall summaries of medicine availability
- The numbers of products with the minimum number of prices by product type
- The median of the median price ratios for all medicines with the minimum number of prices (Figure 8.8).

These data are identical to the data in the summary tables on the individual *Field Data Consolidation* pages. They are collected here for easy comparison.

Figure 8.8 Example of summary comparing overall medicine availability across sectors



Sector Availability and Price Summary

Go To Home Page | Core Meds./All Meds.

Describe summary: 10 public procurements, private sector retail prices, and patient charges in public & NGO outlets

Summary of Medicines Availability and Median MPR by Product Type
Includes Both Core and Non-Core Medicines (n=30 on list)

Median Percent Availability

	Procure-ment (n=10 orders	Public Sector (n=18 outlets)	Private Sector (n=20 outlets)	Other Sector (n=9 outlets)
Brand	NA	75.0%	77.5%	66.7%
Most Sold	NA	72.2%	80.0%	33.3%
Lowest price	NA	41.7%	40.0%	5.6%

No. of Products With Minimum No. of Prices Obtained

# Prices Required	*1*	*4*	*4*	*4*
Brand	23	23	24	21
Most Sold	21	19	18	14
Lowest price	19	16	18	9

Median MPR for Medicines With Minimum No. of Prices

Brand	8.96	12.45	12.37	12.36
Most Sold	5.63	8.55	9.46	5.50
Lowest price	4.41	8.10	6.48	5.00

Reference Price Data Used = MSH

Interpreting sector availability and price summaries

Begin your analysis by focusing on Figure 8.8, which summarizes medicine availability and overall median of the median price ratios by innovator brand, most sold and lowest price generic equivalent. These data will allow you to make summary descriptions of the findings across sectors and to judge whether the comparisons between individual sectors should use the "matched" analyses.

From the example in Figure 8.8, it is clear that innovator brand and most sold generic equivalents are more widely available than lowest price generic equivalents in all sectors. In public facilities, median availability was 75.0% for innovator brand, 72.2% for most sold generic equivalent, and 41.7% for lowest price generic equivalent. In private retail pharmacies, median availability was 77.5%, 80.0%, and 40.0% for the three types of products while, in NGO facilities, median availability was 66.7%, 33.3%, and 5.6% respectively.

Public procurement prices were obtained for roughly equal numbers of innovator brand (23), most sold generic (21) and lowest price generic (19) products, and patient prices were determined for most of these products at public sector health facilities. Retail prices in the private sector were obtained for about the same numbers of medicines by product type (24, 18, and 18). In the NGO sector, prices were determined for nearly as many innovator brand products (21), but fewer most sold (14) and lowest price generic (9) products. Because only about two-thirds of the products had prices determined in each sector, it will be more

accurate to base inter-sector price comparisons on the "matched" analyses in Figure 8.9 and not to use the median of the median price ratios listed at the bottom of Figure 8.8.

The second section of the *Sector Availability and Price Summary* page compares the medians of the median price ratios across sectors (Figure 8.9). To control for differences in which medicines were found in each sector when comparing prices, the comparisons in this section include only medicines for which the specified minimum number of prices were obtained in both sectors. Each comparison between sectors, involving one of the small tables, reports the median of the median price ratios for the "matching" medicines by product type. To the right of each small table are data on the number of matching medicines included, and the ratio of the median of the median price ratio in the right column of the table to the median of the median price ratio in the left column, expressed as a percent.

Figure 8.9 Example of summary comparing medians of median price ratios across sectors

Sector Availability and Price Summary

Go To Home Page | Core Meds./All Meds.

Describe summary: 10 public procurements, private sector retail prices, and patient charges in public & NGO outlets

Comparisons of Median MPRs for Medicines With Prices in Both Sectors
Includes Both Core and Non-Core Medicines (n=30 on list)

	Procurement (n=10 orders	Public Sector (n=18 outlets)	# of Meds. in Both Sectors	Ratio Public to Procurement
Brand	8.96	12.45	23	138.9%
Most Sold	5.63	8.10	19	143.9%
Lowest price	5.84	8.55	16	146.4%

	Procurement (n=10 orders	Private Sector (n=20 outlets)	# of Meds. in Both Sectors	Ratio Private to Procurement
Brand	8.01	11.25	22	140.3%
Most Sold	6.80	9.46	18	139.1%
Lowest price	5.84	8.96	16	153.2%

	Procurement (n=10 orders	Other Sector (n=9 outlets)	# of Meds. in Both Sectors	Ratio Other to Procurement
Brand	8.96	12.36	21	137.9%
Most Sold	3.96	5.50	14	138.7%
Lowest price	3.18	5.00	9	157.3%

	Public Sector (n=18 outlets)	Private Sector (n=20 outlets)	# of Meds. in Both Sectors	Ratio Private to Public
Brand	11.26	11.25	22	99.9%
Most Sold	9.52	9.46	18	99.4%
Lowest price	8.55	8.96	16	104.7%

	Public Sector (n=18 outlets)	Other Sector (n=9 outlets)	# of Meds. in Both Sectors	Ratio Other to Public
Brand	12.45	12.36	21	99.3%
Most Sold	5.67	5.50	14	97.0%
Lowest price	4.87	5.00	9	102.8%

	Private Sector (n=20 outlets)	Other Sector (n=9 outlets)	# of Meds. in Both Sectors	Ratio Other to Private
Brand	12.45	12.36	21	99.2%
Most Sold	5.77	5.50	14	95.3%
Lowest price	4.96	5.00	9	100.9%

Reference Price Data Used = MSH

When comparing public procurement prices and medicine charges to patients at public health facilities (upper left table of Figure 8.9), it is clear that government facilities charge about a 40% mark-up on medicines (138.9), with mark-ups slightly higher for generic medicines (143.9; 146.4). Medians of median price ratios are high for all product types compared to reference prices. Innovator brand premiums are roughly 40%–50% (based on the ratios of innovator brand to most sold or lowest price generic equivalent prices).

The prices in private sector retail pharmacies are almost identical to charges in public facilities (second table from top on right side of Figure 8.9), with ratios between the median prices in the two sectors approximately equal to 100% (99.9; 99.4; 104.7). Furthermore, the charges to patients in NGO facilities are also nearly identical to both public and private sector prices (third row of tables in Figure 8.9) for medicines where prices could be determined. The near equivalence across sectors of prices paid by patients can have several different explanations:

- The three sectors are all running with equal efficiency, with all paying high prices compared to international standards
- Prices and mark-ups are under heavy government control
- There is a widespread price fixing across sectors, with prices set in comparison to competitors.

These issues are examined further in the Price Composition analyses (pp. 95–97). Hypotheses generated about the reasons for the similarities in pricing can be the focus of future studies.

Reporting medicine availability and price summaries

The way in which you report inter-sector comparisons will vary considerably from survey to survey, depending on the nature of the differences between sectors in your setting and the actual results of the comparisons.

Begin by comparing product availability. You might expect that availability for innovator brand items would be better in the private sector while generic alternatives might be more widely available in the public sector. Your situation may be different, however. If it is, check your data and investigate the reasons for these differences.

For pricing analyses, you have the opportunity to compare median patient prices in each sector to:

- International reference prices, either from MSH or another set
- Public procurement prices
- Patient prices in other sectors.

Results may differ across sectors for innovator brand and generically equivalent products. Depending on the findings, your report could go into great detail on these comparisons, including references to individual products that reveal interesting facts about the way in which pricing operates in your setting.

You do not need to quote all the comparison price ratios or percentages in the text of your report, but you may wish to highlight important or particularly interesting ones, while referring readers to tables with individual medicine or sector summary results for more detailed examination of differences.

ANALYSING TREATMENT AFFORDABILITY

The affordability analysis expresses the survey results in a different way. Instead of comparing medicine prices with an index price, the cost of a course of therapy for important conditions can be compared with the daily wage of the lowest paid government worker. This analysis is very valuable as an advocacy tool as it expresses prices in relation to an individual's ability to pay rather than to international prices. It is much easier to explain to policy makers that the cost of a month's treatment for a specific condition with Medicine X would require

10.5 days' wages with innovator brand products and 6.3 days' wages with a low cost generic alternative. To the extent that standard treatments are similar across countries, expressing results in this way also allows international comparisons of price levels that are not affected as much by differences in economic structures and exchange rates.

Click on the **Treatment Affordability** button on the *Home Page* to go to the *Standard Treatment Affordability* page. The process for defining and entering data on days' wages and on the standard treatments for individual conditions is described in Chapter 7 (pp. 70–72). After you have completed this process, the *Workbook* will automatically calculate the affordability measures in each sector and for each product type for which you have sufficient price data in the *Field Data Consolidation* pages. An example of affordability analysis for pneumonia is provided in Figure 8.10.

Figure 8.10 Example of standard treatment and affordability data for pneumonia

	A	B	C	D	E	F	G	H	I	J
1		Standard Treatment Affordability								
2										
3										
4		Go To Home Page								
5										
6			Daily wage of lowest paid government worker (in local currency):							15
25										
26		Adult resp. infects.						Public Procurement		Public Pa
27		Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days' Wages	Median Treatment Price
28		Amoxicillin	250 mg	tab	7	21	Brand	50.59	3.4	69.85
29							Most Sold	24.65	1.6	33.83
30							Lowest Price	22.49	1.5	30.83

Figure 8.10 (continued)

al currency):	15						
Public Procurement		Public Patient		Private Retail		Other Patient	
Median Treatment Price	Days' Wages	Median Treatment Price	Days' Wages	Median Treatment Price	Days' Wages	Median Treatment Price	Days' Wages
50.59	3.4	69.85	4.7	69.84	4.7	69.43	4.6
24.65	1.6	33.83	2.3	33.74	2.2	33.52	2.2
22.49	1.5	30.83	2.1	31.88	2.1		

To analyse the data, compare the median treatment price and number of days' wages required across sectors and for different product types. In the example, median treatment costs for pneumonia in public sector health facilities, private pharmacies or NGO facilities are almost identical. To provide a full course of therapy with innovator brand amoxicillin would require 4.7 days' wages in public facilities and private pharmacies and 4.6 days' wages in NGO facilities. In contrast, treating pneumonia with generic amoxicillin is less than half as expensive, requiring 2.3, 2.2, and 2.2 days' wages respectively.

When analysing standard treatment data, be sure to examine the range of variation in medicine prices within each of the sectors in the summary ratio section of the *Field Data Consolidation* pages (see Figure 8.4). Treatments for which the median prices are similar in two sectors may actually vary widely across outlets within the sectors.

Remember that for standard treatments which require more than one medicine, it will be necessary to enter each medicine separately and then add together the data on Median Treatment Price and Days' Wages for both medicines to get correct summary information for the treatment as a whole.

The section on affordability in your report should highlight the findings for key conditions of public health importance in your setting. Some conditions may be within the ability of low-paid workers to pay, while others may be completely out of their range. Try to describe the situation for both acute and chronic illnesses. For chronic illnesses, you should express the treatment in monthly amounts, which you would calculate by multiplying the daily dose by 30. If entering non-specified medicines in the *Workbook*, be sure to use the amount for a month's treatment for chronic conditions in the **Total # of Units per Treatment** field.

ANALYSING PRICE COMPOSITION

Cumulative Mark-up by Sector

The *Price Composition: Cumulative Mark-up* page allows you to compare two aspects of the overall pricing structure.

First, you can compare how the Manufacturer Unit Price relates to the International Reference Unit Price of a medicine. This ratio measures the degree to which manufacturers sell certain medicines for internationally competitive prices in your setting.

Second, the cumulative mark-up analysis allows you to compare the Sector Median Unit Price, which is the final unit price of the medicine in each sector, with the manufacturer unit price. This ratio expresses the cumulative mark-up of the medicine between initial purchase from the manufacturer and sale to the patient. The components of this mark-up are differentiated in the next analysis.

The cumulative mark-up analysis allows you to identify whether the root cause of high price levels for specific medicines in a given sector appears to be manufacturers' prices, supply chain mark-ups or both. The *Workbook* allows you to examine these factors for government procurement prices and for patient prices in three different sectors.

The procedures for entering mark-up data are described in Chapter 7. To begin the analysis, click the **Price Composition: Mark-ups** button on the *Home Page*. Figure 8.11 on p. 96 shows a completed mark-up analysis for amoxicillin using data from the sample survey.

Notice that the public sector pack sizes in Figure 8.11 are much higher than in the private or NGO sector. It is not unusual that government procurement systems and public sector facilities purchase bulk packages of medicines, while other sectors buy smaller pack sizes. In general, the unit price should be lower with larger packs.

First, compare the overall ratios of manufacturer's unit price to international reference price across sectors. In the example, manufacturers' prices of amoxicillin in all sectors are much higher than international reference prices, with median ratios ranging from 4.44 to 7.98 for generic products and 10.01 to 16.38 for the innovator brand product. None of the sectors is obtaining internationally competitive prices for this medicine, although the manufacturers' prices obtained by private retail outlets are slightly better.

Figure 8.11 Example of cumulative mark-up of medicine price by sector

	A	B	C	D	E	F	G	H	I
1		Price Composition:							
2		Cumulative Mark-ups							
3									
4		Go To Home Page				*Reference Price Data Used = MSH*			
5									
6		Select Medicine Name 1	Medicine Strength	Dosage Form	Sector	Item	Brand	Most Sold	Lowest Price
7		Amoxicillin	250 mg	tab	Public Procurement	Manufacturer pack price	2409.000	1174.000	1071.000
8						Manufacturer pack size (# of units)	1000	1000	1000
9						Manufacturer unit price (MUP)	2.4090	1.1740	1.0710
10						Ratio: MUP to reference unit price	16.38	7.98	7.28
11						Sector median unit price (SMUP)	2.4089	1.1739	1.0712
12						% mark-up: SMUP over MUP	0.0%	0.0%	0.0%
13					Public Patient Charge	Manufacturer pack price	2409.000	1174.000	1071.000
14						Manufacturer pack size (# of units)	1000	1000	1000
15						Manufacturer unit price (MUP)	2.4090	1.1740	1.0710
16						Ratio: MUP to reference unit price	16.38	7.98	7.28
17						Sector median unit price (SMUP)	3.3261	1.6108	1.4682
18						% mark-up: SMUP over MUP	38.1%	37.2%	37.1%
19					Private Retail Price	Manufacturer pack price	117.800	76.400	65.300
20						Manufacturer pack size (# of units)	80	100	100
21						Manufacturer unit price (MUP)	1.4725	0.7640	0.6530
22						Ratio: MUP to reference unit price	10.01	5.19	4.44
23						Sector median unit price (SMUP)	3.3259	1.6067	1.5181
24						% mark-up: SMUP over MUP	125.9%	110.3%	132.5%
25					Other Sector Patient Charge	Manufacturer pack price	128.500	82.200	69.840
26						Manufacturer pack size (# of units)	80	100	100
27						Manufacturer unit price (MUP)	1.6063	0.8220	0.6984
28						Ratio: MUP to reference unit price	10.92	5.59	4.75
29						Sector median unit price (SMUP)	3.3060	1.5960	
30						% mark-up: SMUP over MUP	105.8%	94.2%	

Next, examine the structure of the mark-ups for the different sectors. In public health facilities, there is about a 37–38% mark-up over procurement price for all amoxicillin products, representing delivery charges, administrative fees, and cost recovery.

Private retail outlets and mission hospitals obtain substantially lower manufacturers' unit prices for all amoxicillin products despite purchasing in smaller pack sizes. However, patients pay about the same prices for this medicine in these sectors because mark-ups are much higher. In private retail outlets, the observed mark-ups were 125.9% for innovator brand, 110.3% for most sold and 132.5% for lowest price generic amoxicillin. In NGO health facilities, the mark-ups were 105.8% for innovator brand and 94.2% for most sold generic amoxicilllin (there were not enough prices obtained for lowest price generic amoxicillin to obtain a sector median unit price).

In your report, you should try to summarize the results for cumulative mark-ups across a range of products. You may want to give the ranges of manufacturer's unit price to international reference price ratios for different types of medicines in different sectors or to average the cumulative manufacturer's unit price to Sector Median Unit Price mark-ups.

Components of price

The Medicine Price Components form is used to collect data on the various components of price mark-ups for several surveyed medicines. The *Price Composition: Components of Price* page is used to enter and analyse these data. The most revealing analyses will compare medicines that are likely to have different price structures, such as:

- Imported versus locally manufactured medicines
- Medicines still on patent versus medicines recently off patent versus older medicines.

For each medicine for which price components are determined, the final price paid by patients in a specific sector is compared to the import or manufacturer's price. Data on the individual components of the overall price mark-up are entered in this worksheet, either as percentage mark-ups or fixed amounts, as appropriate. Because mark-ups are sometimes charged as fixed fees at the point of dispensing (e.g. a dispensing fee), the mark-ups are calculated on a typical dispensed quantity of the medicine.

The *Price Composition: Components of Price* page has five tables, each summarizing the mark-up structure for one medicine in a specific sector. Click on the **Price Composition: Components** button on the *Home Page* to get to this page. The process for entering price components data is described in Chapter 7 (pp. 72–74). Figure 8.12 shows an example of a completed price components table.

Figure 8.12 Example of table detailing the components of price

Price Composition: Components of Price

Go To Home Page

Describe sector and type of medicine: Most sold generic version of amoxicillin in private sector purchases

Example 1: Medicine Name	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative % Mark-up
Amoxicillin	250 mg	tab	100	21	Cost, insurance, freight (CIF) price	NA	NA	44.94	0.00%
					Port clearance	percent	3.0%	46.29	3.00%
					Import tax	percent	8.0%	49.99	11.24%
					Stamp duty	percent	1.1%	50.54	12.46%
					Wholesale mark-up	percent	15.0%	58.12	29.33%
					VAT	percent	11.0%	64.52	43.56%
					Dispensing fee	fixed fee	5.0	69.52	54.69%

To analyse price components, examine the total mark-up structure to identify the factors that contribute the greatest amount to the total cost for each medicine. In the example, the wholesale mark-up of 15% adds the single largest amount to the total mark-up, followed by the 11.0% VAT and the 8% import tax. In total, government taxes add 24.83% to the dispensed cost of this medicine, while wholesale and retail mark-ups add another 29.86%. If fees differ by medicine type or by sector, use an example to illustrate these differences and their policy implications.

In your report, you should summarize the mark-up structures for all medicines for which you have entered price components, and highlight differences across medicine types.

9

International price comparisons

- International price comparisons can provide valuable tools for advocacy
- Comparisons can be made of:
  - The prices of individual medicines, from manufacturer to patient
  - The affordability of treatment
  - Price composition
- Countries undertaking a survey are encouraged to send their results to HAI which will lodge them on the website so that they can be shared with other countries.

Comparisons of medicine prices in different countries can provide powerful tools for advocacy. Reliable evidence that the populations of two similar countries are paying very different prices for the same medicine provides an opportunity for advocates and policy makers in the higher price country to examine the underlying reasons and to identify ways of obtaining lower prices. Chapter 10 offers some suggestions about how price differences can give clues to possible lines of action to bring prices down.

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 are designed to enable international comparisons to be made of:

- The prices of individual innovator brand or generic medicines, from each defined sector, on the "core" list
- The affordability of selected courses of treatment, measured against each country's public sector minimum wage
- The way in which the retail price of a medicine is composed in different countries.

Composite comparisons, where the prices of a sample of medicines (rather than individual items) are compared between countries, require special statistical methods and skills, as well as additional data. They have been used to determine whether medicines are more expensive in general in one country than another. Guidance on such comparisons is not given here, although some recent studies and methods are identified at the end of this chapter.

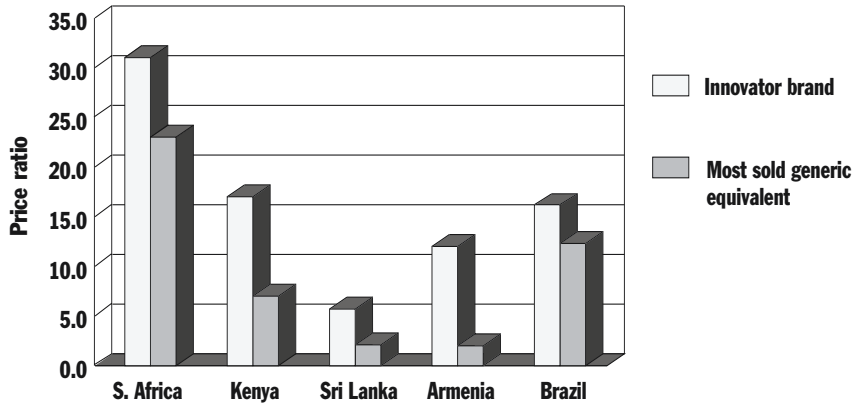
The HAI website has a section dedicated to the storage of country price data collected in accordance with the procedures suggested in this manual. It will allow you (and others) to compare your data with those from other countries in

which similar price surveys have been carried out. You are strongly encouraged to send your completed *Workbook* to HAI so that it can be checked and entered in this publicly accessible database.

COMPARISONS OF THE PRICES OF INDIVIDUAL MEDICINES

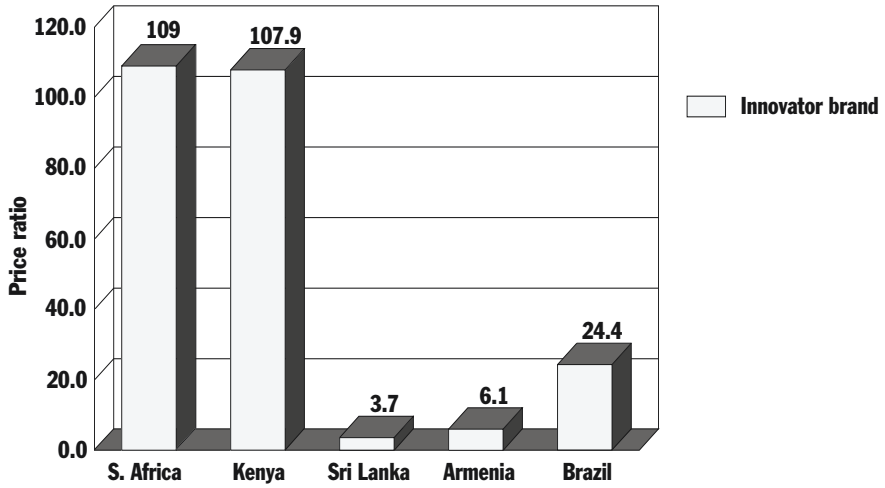
Figure 9.1 below shows how you can use your data and data from other countries to compare the median price ratio (your local median price for a medicine, converted at current exchange rate into in US$, compared to the MSH reference price) for the same medicine in several countries. Figure 9.1: Private sector price ratios for ranitidine in five countries shows that, while the innovator brand premium in all countries except South Africa is less than 30 times the international reference price, countries' prices differ markedly from the international benchmarks. South Africa's private sector price for the innovator brand is over 30 times the international reference price and over twenty times higher for the generic equivalent. Comparable ratios in Sri Lanka are 5.6 (innovator brand) and 2.2 (generic).

Figure 9.1 Ratio of local price to international reference price for innovator brand and generic ranitidine in five countries, 2001



You can, of course, further simplify this by (for example) comparing only the innovator brand price ratios between countries, as in Figure 9.2. Similar formats will be needed for the private or "other" sectors, where these data exist.

Figure 9.2 Ratio of local price to international reference price for innovator brand furosemide (40 mg tablets) in five countries, 2001



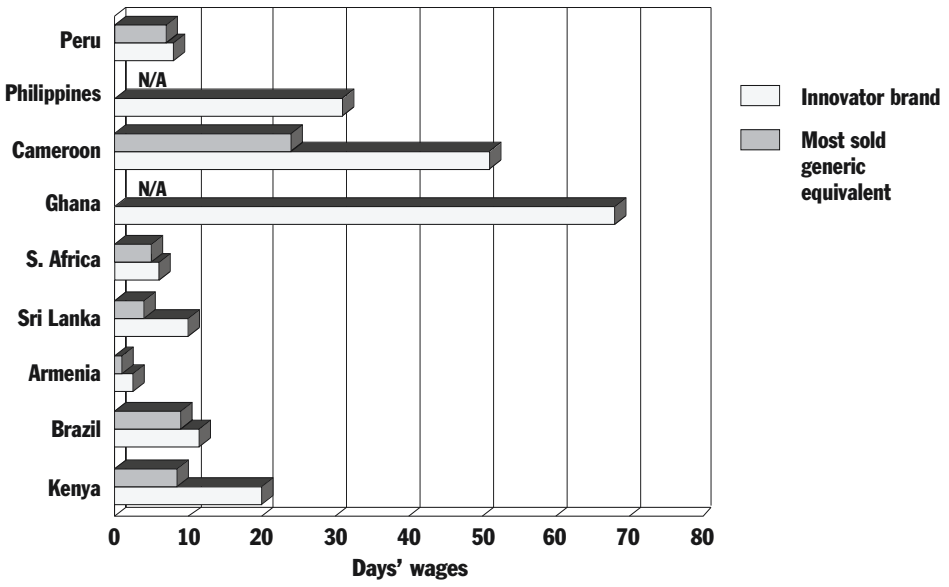
Each of the surveys using this approach uses the same set of reference prices for all studies conducted in a given year, so the median price ratio for innovator brand ranitidine or furosemide in Sri Lanka can be compared directly to its equivalent in South Africa or any other country. Remember, a median price ratio 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 as, for reasons mentioned above, the development of 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 mark-ups, duties and taxes may be more important than manufacturers' selling prices in explaining the differences. Where the same items recur in the Top and Bottom Five, the manufacturers' selling prices may be the major component in retail price. Further investigation of price composition will probably be necessary to ascertain this, before the focus of policy is turned on to manufacturers' selling prices.

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 (see 'Analysing Treatment Affordability' on pp. 93–95) to a cross-country comparison chart, as in the example in Figure 9.3.

Figure 9.3 Inter-country comparison of affordability: number of days' wages needed for purchase of 30 days of treatment with ranitidine



The figure shows that ulcer treatment with ranitidine in Ghana, where no generic was found, costs over two months' of income for a person on the lowest government wage, while the same treatment course in Sri Lanka or South Africa would cost the equivalent of about a week's wages. A course of treatment with the generic medicine in Sri Lanka, Cameroon or Kenya costs about half as much as with the originator product, although it is still likely to be unaffordable for much of the population.

Once again, sectors should be compared separately.

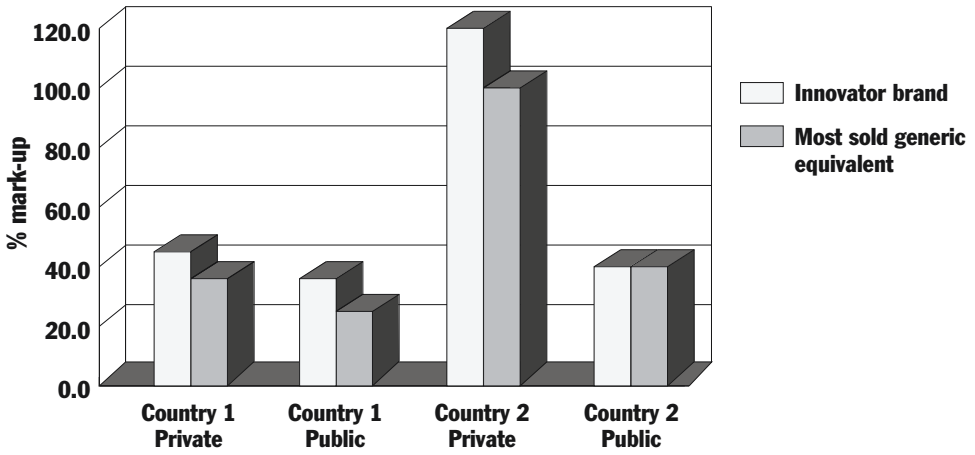
COMPARISONS OF PRICE COMPOSITION

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. The Manual and *Workbook* offer you two ways of doing this.

International comparisons of mark-ups on innovator brand and generic equivalent for a single medicine

The first approach is to make a broad-brush comparison of cumulative mark-ups by comparing retail prices with manufacturers' prices, as described in Chapter 8. Obviously, you can make this relationship the basis of comparisons between countries for individual medicines. Figure 9.4 gives a fictitious comparison of the cumulative percentage mark-up reflected in the median unit retail price for amoxicillin in the public and private sectors of two countries. The innovator brand and most sold generic equivalent are compared.

Figure 9.4 Cumulative percentage mark-up (sector median unit price as a percentage of the manufacturer's unit price)



Private sector mark-ups are much higher in the private sector of Country 2 than in Country 1. The mark-ups on innovator brand and generic equivalents are identical in Country 2, whereas they are slightly higher on the innovator brand in country 1.

International comparisons of price components

The second approach is to look in greater detail at the individual components in the price chain between the manufacturer and the point of sale. In the pilot study of this approach in Sri Lanka, the team developed a format similar to the one shown in Figure 9.5 to summarize the components of retail price. This gives the percentage additions to the imported (CIF: manufacturers' selling price plus insurance and freight costs) price or the local ex-manufacturer price and also shows them cumulatively. This format is now recommended for all investigators using this approach. Information on price composition from other countries can be found on the price information section of the HAI website: http://www.haiweb.org/medicineprices.

Again, the public sector and others should be compiled separately. The following section gives some guidance on interpreting these data.

Figure 9.5 Example of comparison of price components between two countries

Country 1				
Type of Charge	**Charge Basis**	**Amount of Charge**	**Price of Dispensed Quantity**	**Cumulative % Mark-up**
Cost, insurance, freight (CIF) price	NA	NA	609.00	0.00%
Defence levy	percent	5%	639.45	5.00%
Overhead mark-up	percent	18%	754.55	23.90%
SPC mark-up	percent	9%	822.46	35.05%
Wholesale mark-up	percent	7%	880.03	44.50%
Retail mark-up	percent	12.5%	990.04	62.57%

Country 2				
Type of Charge	**Charge Basis**	**Amount of Charge**	**Price of Dispensed Quantity**	**Cumulative % Mark-up**
Cost, insurance, freight (CIF) price	NA	NA	609.00	0.00%
Import duty	percent	25%	761.25	25.00%
Port charges	percent	5%	799.31	31.25%
Wholesale mark-up	percent	40%	1119.04	83.75%
Retail mark-up	percent	15%	1286.89	111.31%
VAT	percent	12%	1441.32	136.67%
Dispensing fee	fixed fee	200	1641.32	165.91%

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 and the United States have commissioned such comparative work in recent years (Productivity Commission, 2001; United States General Accounting Office, 1994).

A simple average of prices in the sample means that every medicine in the sample 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. To get around this problem, statisticians assign a weight to the price of each item in the sample to reflect its relative importance. An average is then calculated of the weighted prices; this is called an index price. This procedure is common with price indices which 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.

The methodology for such studies requires both statistical skills and data which go beyond the scope of the approach described in this manual to price sampling and comparison. Readers who are interested in the details of more ambitious international comparisons are recommended to read the US and Australian studies mentioned above. An introduction to the methodology of such comparisons is given in *Economics of the Pharmaceutical Sector* (Schweitzer, 1997). A more detailed methodological discussion is contained in Danzon and Chao (2000).

For the reasons given above, it is recommended that cross-country comparisons should be limited to comparing the costs of individual medicines, expressed as ratios of national prices compared to the MSH reference prices and expressed in days' wages. The differing mark-ups may also be compared. Finally, comparing the top five and bottom five medicines in terms of cost compared to reference prices or affordability may be more than enough to support your conclusions and recommendations.

Comparing overall combined ratios may leave you open to criticism that you are not comparing like with like and could discredit your report. People who may be exposed and made to look bad by the findings of the study may prefer to attack the methods used in the study rather than addressing the results. By limiting yourself to individual medicines, as distinct from composite comparisons, you can be confident that your results are totally defensible.

10

Exploring possible policy options and lines of action

- A number of factors can cause high medicine prices
- This chapter illustrates a menu of possible policy instruments which may be relevant in different circumstances of high prices
- It is important to identify the factors that are the principal causes of high prices and/or of price variations in your setting.

The underlying purpose of the price survey is to bring about changes that will result in lower prices to patients and, hence, increased access to needed medication. Chapter 8 has shown how to generate and present summary results from the survey for each individual medicine and each sector, as well as how to analyse treatment affordability and price composition. This chapter shows some of the linkages between the price and availability information you can now present, and a range of possible policy actions that will greatly improve regular access to essential medicines at prices affordable to all.

The potential for change varies dramatically between countries and can also change over time. The ability to build a case and a constituency of support on a particular issue also depends very much on local circumstances. In many instances it may be necessary to collect additional information before identifying and promoting a particular change. Because the local context is of overriding importance in determining the most appropriate lines of action to follow a price survey, this manual can only give general guidance. The previous chapters give clear directions on how to proceed with the design, execution and analysis of the price survey, but this chapter simply identifies possibilities, leaving it to the survey manager/commissioning organization to research and judge which, in the context of local institutions and politics, are the most appropriate actions to follow. In the second phase of this joint project (2003–2004), WHO and HAI plan to support in-depth studies of price issues in several countries and to synthesize and publish the resulting policy implications and actions.

Findings from the survey, for example, may suggest that the prices of individual medicines in the public sector are five, ten or even forty times higher than the MSH reference prices. Even with the analysis of price composition, however, it may be unclear how much of this price difference is due to high manufacturers' prices and how much to inefficient procurement practices or other price elements in the national system, such as mark-ups and taxes. Each of these possible

causes will need to be addressed by a different line of action and will incur support and opposition from different stakeholder groups. A more systematic examination of the different possible contributory factors will always be necessary to ensure that the principal cause is correctly identified.

DATA FROM THE SURVEY AND ITS INTERPRETATION

To recapitulate from Chapter 8, your survey results allow four different types of price and availability comparison.

Type 1: Individual medicine price comparisons

- For every medicine and in each sector, comparison with international reference price benchmarks and, as they become available, against the relevant prices in other country surveys
- For any innovator brand medicine, comparison with the most sold and lowest price generic equivalents, and comparison of availability
- For every medicine, public and private sector prices and, where appropriate, prices at NGO, church mission or other health facilities
- Comparison of the manufacturers' price or the procurement price with the international reference price and with the retail price for any medicine in each sector.

Type 2: Availability comparisons

- Availability of innovator brand medicines compared with generic equivalents in up to four sectors, separately and compared.

Type 3: Affordability comparisons

Treatment costs in relation to local wages compared by:

- Condition (nine recommended)
- Treatment affordability by sector: public, private and other sectors
- Treatment affordability by medicine type: innovator brand, most sold or lowest price generic equivalent
- When available, treatment cost for a given condition compared with the cost of the same treatment in other countries.

Type 4: Price composition comparisons

- Price components of locally made medicines compared with imported medicines
- Manufacturer's price or tender price compared with retail price
- Comparison of relative size of mark-ups (wholesale and retail), taxes, duties, tariffs, etc. in final price
- Comparison of price composition of essential (EML) medicines with non-essential medicines, if applicable.

In looking for lines of action and policy, it is important to focus on comparisons that show big differences between local and international prices, between sectors, between innovator brand medicines and generics, between wage levels and treatment costs and on the major components of mark-ups. Differences suggest the possibility that prices can be brought down: the bigger the difference, the greater the scope for change.

Some of the different manifestations of price differences or problems detected will, of course, originate in the same cause. The affordability of treatment for pneumonia may be a problem and prices for innovator brand amoxicillin high in relation to international reference prices, for example, simply because the innovator sets a high price. If procurement is also inefficient, and distribution arrangements are expensive because of high mark-ups by wholesalers and retailers, and no generics are available, the price problem could be attacked with several prongs. Better procurement, price negotiation, parallel importation, reform of prescribing and dispensing incentives and thus practices, generic promotion, or consideration of a compulsory licence or use of any other legal safeguards in national legislation that may facilitate the availability of cheaper generic versions of medicines under patent in the country, may all be needed.

Where the analysis of price composition suggests that local factors, such as tariffs, taxes and distribution mark-ups contribute importantly to final price, a general review of distribution costs may be necessary. Among other things, this might consider whether essential medicines are exempt from import duties and other taxes, how distribution costs, particularly mark-ups, compare in the different domestic systems (public, NGO and private), and how medicines distribution costs compare with those of other commodities, such as perishable foods and beverages.

Where local add-ons and distribution costs appear to be less important contributors to final price, but prices are high relative to international benchmarks, there may be a need to examine the efficiency of national and sub-national procurement processes in getting the best possible prices. A supportive national policy on generic medicines, particularly in the selection, procurement, promotion, prescribing and dispensing processes outlined in Figure 10.1, is needed to underpin price regulation. Pooling procurement, ensuring competitive tendering and use of information about prices in other markets may all help. Where innovator brand prices appear to be high relative to prices in other countries, you may wish to consider negotiating for differential prices with the manufacturer or explore the possibility of parallel importation from a lower price country. Compulsory licence strategies may be considered for key limited source medicines of major public health importance, in addition to the preceding measures and other approaches to allow the marketing of less expensive generic equivalent medicines. Fairer financing schemes for medicines can improve access through employment or community-based insurance and social security schemes and other forms of prepayment, and through exemptions in fee systems to minimize the price barrier for poor people.

It is important to provide empirical data to policy makers on the need for policy change and to develop a close understanding of why the differences exist before selecting the line of action and making suggestions regarding the direction of government policy. Broadly speaking, it may be helpful to think in terms of policies concerned with getting better prices from manufacturers or intermediaries, on the one hand, and those designed to keep prices as close to the manufacturers' prices, through cost containment measures, on the other.

A wide range of policy measures exists to deal with price and availability problems. Figure 10.1 summarizes some of the possible policy actions to influence price, based on the WHO publication *How to Develop and Implement a National Drug Policy* (WHO, 2001).

In conclusion, bear the following messages in mind about linking the survey findings to lines of policy action:

Figure 10.1 Controlling price as part of an integrated medicines policy

Component of medicines policy	Examples of actions to influence price and availability
1 Selection of essential medicines	■ Formulation/updating of essential medicines lists ■ Development of quality-assured therapeutic substitution policy ■ Development and use of Standard Treatment Guidelines
2 Procurement/purchasing	■ Competitive tender with price transparency ■ Use of pharmacoeconomics or international reference prices as guidelines ■ Pooled procurement with other national/international buyers ■ Examine purchasing in other sectors to ensure best practice ■ Create incentives and education for making procurement savings; give margin of preference for local suppliers ■ For single source products, press for differential price or explore possible parallel imports ■ Use national Patent Law flexibilities, where possible, to stimulate generic penetration ■ Ensure price monitoring and public information
3 Distribution system	■ Analyse for efficiency, probity, competitiveness and intervene to correct: e.g. by contracting to private and not-for-profit logistics and security organizations ■ Monitor mark-ups
4 Generic competition	■ Ensure effective quality assurance capability and substitution incentives at all levels ■ Promote generic acceptance by professionals and patients ■ Prequalify generic manufacturers ■ Fast-track regulatory approval of generic medicines
5 Prescribing and dispensing	■ Ensure consumers, private sector and NGOs are informed and involved ■ Build incentives to prescribe and dispense generic medicines, encourage separation of prescribing and dispensing, ensure consumer information ■ Monitor
6 Financing	■ Encourage pooled and prepaid financing of medicines: e.g. through employment-based or social insurance schemes ■ Support community-based insurance initiatives focused on improved access to essential medicines ■ Ensure exemptions or differential fee systems to protect access by the poorest ■ Monitor prices and access

- Any individual price problem may have several contributing causes and may require action on several fronts.
- It is important to be sure about which are the *most important contributing causes* before deciding on a strategy to change policy. It is counterproductive to employ cost-containment strategies when the problem lies with manufacturers' prices, and vice-versa. Ascertaining this may require more research and technical support. Look for help from international experience with similar problems, such as mark-up levels and regulation.
- Analyse the relevant stakeholder positions, strengths and weaknesses carefully before deciding how to formulate a plan for change. Build your coalition of support carefully and selectively.

- Use your judgement about whether, when and how to involve the mass media.
- Meet with Ministry of Health officials and ascertain what procurement barriers they may be experiencing. Consider a multi-sector approach: e.g. including officials from the Ministries of Health, Finance and Trade.
- Consider facilitating cohesive policy making: e.g. a roundtable with Ministry of Health officials from your region.
- Lower medicine prices require much greater transparency in transactions at all levels; more openness and better public information will help to create a constituency for change. Change is possible.

11

Reporting

- The purpose of the survey is to stimulate action to make medicines more affordable to the whole population; this requires accurate reporting and effective dissemination and advocacy
- The survey findings should be presented in the most appropriate way for the various audiences and disseminated both generally and to specific audiences
- The *Workbook*, report and related documents should be e-mailed to HAI or WHO Essential Drugs and Medicines Policy Department.

The ultimate objective of conducting the medicine price survey is to contribute to making medicines affordable so that the entire population can have access to them when they need them. Conducting the survey, analysing and interpreting the data are important stages, but the final use of the results will depend on the effectiveness of a further three important steps:

- Reporting
- Dissemination
- Advocacy.

Without these steps, the survey will be an interesting but futile exercise.

SURVEY REPORT

As the tool will be used by various stakeholders for various purposes, the way in which the survey results are reported depends on who is reporting to whom, and the objectives of the report.

A report prepared by a consumer organization advocating for affordable medicine prices, for example, will differ from that prepared by a medicine policy section of a Ministry of Health reporting on the impact of pricing tariffs. Different analyses and tables are likely in the survey report and, correspondingly, different recommended actions. However, information on many aspects of the survey need to be included in reports, irrespective of the reporter or objective. All reports need to state:

- Executive summary
- Who undertook the survey
- Its purpose

- When the survey was conducted
- Information on the national medicines situation relevant to prices
- Outline of the methodology used, such as:
  - Sectors surveyed
  - Sampling method
  - Sites surveyed
  - Medicines surveyed
- Ethical issues, including:
  - Confidentiality
  - Endorsements
  - Possible conflicts of interest
- Results, with national and international comparisons
- Discussion
- Recommendations.

Chapters 8 and 9 give guidance on analysing and interpreting the data and making international comparisons. Chapter 10 outlines possible lines of action. This guidance is intended to assist you when drafting the sections in your report on the results, discussion and recommendations.

To further assist you, an example of a national survey report is included as Annex 5. Note that in the example survey report, annexes are indicated but not included. The report was developed from the perspective of a local NGO advocating for affordable medicines and is intended merely as an illustration. You will need to draft your report as you see fit.

To heighten awareness of variations in medicine prices, you are encouraged to use actual prices in local currency in addition to the ratios in, for example, comparing innovator brand with most sold and lowest price generic equivalents.

It is strongly recommended that the survey report should be drafted, reviewed, finalized and disseminated as quickly as possible, preferably within one month of completing the survey. The survey findings could otherwise become outdated by policy or market changes, such as inflation, fluctuating currency exchange rates or price changes.

PRESENTING THE FINDINGS

A meeting of key national managers and policy makers should be held after the report has been prepared to brief them on the findings of the survey. You should outline:

- The purpose of the survey and the process of data collection
- A summary of the results and comparison with data from previous national or international price surveys
- Medicine prices by sector, identifying the five or ten highest priced medicines

- The overall findings and the reasons for any observed differences
- Issues that need to be addressed through national policy and strategy on medicine procurement.

Experience shows that the findings of medicine price surveys are invariably questioned and criticised. Be prepared for such situations.

The findings of the survey can be presented and reported in a number of formats; indeed, in order to achieve the maximum coverage and impact, it is advisable to present them in the most appropriate form for the target audience.

Survey report

The example of a survey report in Annex 5 is presented in both descriptive and tabular form. This form of technical report would be particularly useful for Ministries of Health, researchers and academics. An executive summary at the beginning of the report highlighting key findings and recommendations will be welcomed.

Policy briefing paper

The survey findings and recommendations can be reported as bullet points on a one page policy brief for busy government ministers, cabinet members and members of parliament. Accompany the briefing paper with the full report for those who want detailed information.

Journal articles

The survey report will provide the basis for an article for publication in the specialist press, such as a medical journal. If the survey has been conducted by a consumer organization or a health related NGO, consumer magazines may be willing to publish an article.

Media

The national media are always interested in good stories and may be willing to report on the findings of the survey, particularly if they receive a press release or article presenting the information in a reader-friendly form.

DISSEMINATING THE FINDINGS

In order to achieve wide coverage, the findings of the survey should be disseminated both generally and to targeted audiences.

Targeted dissemination of the survey report should include, where relevant:

- Medicine policy section of the Ministry of Health
- Ministry of Finance
- National bureau of statistics
- National public health and medical associations
- National medical research council
- National pharmacy association
- Consumer organizations (national and international)

- Health related NGOs (national and international)
- Bilateral donors
- WHO (country offices, regional offices and headquarters)
- Associations of pharmaceutical companies (multinational and national)
- Individual pharmaceutical companies (multinational and national)

General dissemination should include:

- Ministry of Health officials other than those directly related to medicine policy and procurement
- Ministries of Trade and Commerce
- Academic and research institutions, public health institutions
- Members of Parliament (with briefing paper)
- Media (along with press release and article for publication in the press)
- Medical journals (along with a journal article).

The survey report, press release, policy briefing paper and so on should be lodged on the website of the organization that undertook the survey. The press release and key findings should be e-mailed to listservs such as e-drug and ip-health (see p. 122 for information on subscribing to these listservs). Note that these listservs do not accept attachments. Instead, you can include a hyperlink to the full survey report on your website.

Reporting to Health Action International and the World Health Organization

In order to enable international comparisons of medicine prices to be made, all survey results need to be sent to the European office of Health Action International (located in Amsterdam, the Netherlands) and the WHO Essential Drugs and Medicines Policy Department. HAI and WHO/EDM will be monitoring the database.

The results will be reviewed before being lodged in the database of medicine prices on HAI's website. In addition to look-ups on national medicine price ratios, affordability and price component data, each survey will be individually profiled. The name and contact details of the survey manager will be given, along with the completed *Workbook*, survey report and any associated documents. Data on individual facilities will be deleted so that confidentiality is assured. Requests for this data will be forwarded to the survey manager.

Please e-mail the following documents for the website to HAI (info@haiweb.org) and to WHO/EDM (medicineprices@who.int):

- Name and contact details of the survey manager
- Computerized *Workbook*
- Survey report
- Training materials
- Policy briefing paper, journal articles, media articles.

WHO/EDM and HAI welcome feedback on improving the manual and database. E-mail your comments to HAI in the first instance. They will be discussed by the project's Advisory Group during the further development of the manual.

12

Development of the manual and beyond

The development of a standard methodology to measure medicine prices poses a number of challenges.

The nine pilot field studies identified numerous issues that the project advisory group had to address in developing the Manual and *Workbook*. Most of these issues reflected the diversity of national medicine markets. For example, selecting an appropriate list of core medicines was problematic as countries have different medicines on the market, in varying dosage forms, strengths and pack sizes. In addition, usage varies to such an extent that a medicine used as first-line therapy in one country may rarely be used to treat the same condition in another country. Other aspects of non-uniformity included the varying sectors that are involved in medicine dispensing. These can range from only two sectors (public sector and private retail pharmacies) to numerous sectors (public sector, private sector, the NGO sector, employer-provided health facilities, dispensing doctors, etc.) There were also other issues that required pragmatic solutions; for example, how could an NGO with limited funds and time select a representative sample of pharmacies to visit in a country the size of Brazil? The work undertaken to date included addressing this issue and many others.

In short, the challenge was to ensure that the methodology was relevant for national (or provincial) surveys, but could also be the basis for valid, albeit limited, international comparisons of the prices of medicines. The methodology therefore had to be designed with flexibility in mind. But more surveys need to be conducted to ensure it is suitable in diverse medicine markets. For this reason, the manual remains in development pending the evaluation of further surveys.

During 2003 and 2004, governments, NGOs and others are encouraged to undertake country-specific surveys using this manual and the accompanying *Workbook*. Sub-regional or regional workshops are planned to support these studies. Investigators are also encouraged to submit their survey results to HAI for lodging on the website and to participate in an evaluation of the manual. In order to further develop the manual, it is vital that investigators provide feedback on what went well and, most importantly, what was problematic.

It is intended that the development of the methodology will also include:

- Testing its reliability by undertaking simultaneous surveys in a country
- Validating the sample size and methods
- Validating medicine prices by conducting a surrogate patient survey
- Assessing factors to take into account in time series analyses.

Following the evaluation of national surveys and these activities, the manual will be updated (planned for late 2004).

The methodology is designed to provide much needed information on the prices people pay for medicines. It does not prejudge the causes of high prices and significant price variations. Further investigation and dialogue are necessary to determine causes and suitable lines of response. The second phase of this project will therefore include in-depth investigations into medicine price discrepancies and policy options for reducing prices.

As stated at the beginning of this manual, unaffordably high prices are a major barrier to the use of medicines and better health. It is hoped that this manual, even in its first stage of development, will provide much needed transparency and information about the prices that people pay for medicines.

Glossary

Active pharmaceutical ingredient (API)
The chemical substance responsible for a product's effect. In this manual, it is called "substance".

Affordability
The cost of treatment in relation to peoples' income. In this survey, the daily wage of the lowest paid unskilled national government worker is used for comparison with the cost of a defined course of treatment for a specific condition.

Brand name
Name given to a pharmaceutical product by the manufacturer: e.g. Valium is the innovator brand name (also called trade name) for diazepam. The use of this name is reserved exclusively to its owner as opposed to generic names: e.g. diazepam. In this manual, if it is the innovator's product it is called "innovator brand".

Brand names may also be used for generic products; they are then often called "branded generics". These brand names are different from innovator brand names. *See* Generic medicine.

Cost, insurance, freight (CIF)
Shipping term meaning the seller must pay the costs, insurance and freight charges necessary to bring the goods to the port of destination.

Dispensing fee
Normally a fixed fee that pharmacies are allowed to charge per prescribed item instead of or in addition to a percentage mark-up. The fee more accurately reflects the work involved in handling a prescription; a percentage mark-up makes profit dependent on the sale of expensive medicines.

Dosage form
The administration form of the completed pharmaceutical product: e.g. tablet, capsule, mixture, injection. Also called dose form or dosing unit.

Drug
See Medicine.

Essential medicines
Essential medicines are intended to be available within the context of functioning health systems at all times, in adequate quantities, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and community can afford. The WHO Model List of Essential Medicines (WHOML) is intended to be flexible and adaptable to many different situations; the precise

definition of the medicines that are regarded as essential remains a national responsibility.

Free on board (FOB)
Shipping term meaning the buyer must pay all costs and insurance against risks of damage once goods are loaded for shipping.

Generic medicine
A pharmaceutical product usually intended to be interchangeable with the innovator brand product, manufactured without a licence from the innovator manufacturer and marketed after the expiry of patent or other exclusivity rights.

Generic medicines are marketed either under a non-proprietary name (INN), for instance diazepam or occasionally another approved name, rather than under a proprietary or brand name. However, they are also quite frequently marketed under brand names, often called "branded generics". In Kenya, for example, there are six different generic products with brand names for diazepam (in addition to Valium).

The manual *Marketing Authorization of Pharmaceutical Products with Special Reference to Multi-source (Generic) Products* (WHO/DMP/RGS/98.5) defines and uses the term "multi-source pharmaceutical product" for generic products. This includes even an innovator brand for which the patent has expired. This definition of a generic is used in some countries, but this manual distinguishes between innovator brand, regardless of its patent status, and generic equivalents.

Innovator brand premium
The difference in retail price between the innovator brand and a generic equivalent.

Innovator pharmaceutical product/innovator brand
Generally the product that was first authorized world wide for marketing (normally as a patented product) on the basis of the documentation of its efficacy, safety and quality, according to requirements at the time of authorization: e.g. Valium. The innovator product always has a brand name; this may, however, vary between countries.

Some substances are so old that no innovator can be identified and patent was probably never claimed. This is the case with such substances as penicillin V, prednisolone and isoniazid. This manual recommends using the highest cost brand as the innovator brand in those cases.

International Non-proprietary Name (INN)
A common, generic name selected by designated experts for the unambiguous identification of a new pharmaceutical substance. The selection process is based on a procedure and guiding principles adopted by the World Health Assembly. INNs are recommended for worldwide use. This manual uses INNs.

The system was introduced by WHO in 1950 as a means of identifying each pharmaceutical substance or active pharmaceutical ingredient by a unique name that is universally accessible as public property (non-proprietary). It is often identical to the generic name: e.g. diazepam. A brand name (trade name) should not be derived from the INN name.

A comprehensive list of names for radicals and groups updated per 2002 can be found in the document *International Nonproprietary Names (INN) for pharmaceutical substances* (WHO/EDM/QSM/2003.1).

Interchangeable pharmaceutical products
Products within a therapeutic class, but with different active ingredients are interchangeable if they have equivalent therapeutic effect.

Mark-up
A certain percentage added to a purchasing price to cover the cost and profit of the wholesaler or retailer.

Marketing authorization
An official document issued by a competent medicines regulatory authority for the purpose of marketing or free distribution of a product after evaluation for safety, efficacy and quality. "Registration" is another term used for this purpose.

Median
There are three ways of expressing the average value: mean, median and mode. The mean is simply the sum of the values divided by the number of values. The median is the value that divides the distribution in half. If the observations are arranged in increasing order, the median is the middle observation. The median is a useful descriptive measure if there is an asymmetrical distribution of the data or there are one or two extremely high or low values, which would make the mean unrepresentative of the majority of the data.

The median is correctly used with the interquartile range to summarise markedly non-normally distributed (asymmetrical) data. *See* "Percentile".

Medicine
Any dosage form containing a substance approved for the prevention and treatment of disease. The term "medicine" is increasingly used to distinguish it from a drug as a substance that is misused. *See also* Pharmaceutical product.

Medicine outlet
A term sometimes used to describe a shop that is not owned or run by a pharmacist and that has a limited licence. However, in this survey "medicine outlet" is used more broadly to identify any place in which medicines are sold, including pharmacies/dispensaries in public and NGO health facilities, private hospitals, etc.

MSH (Management Sciences for Health) reference prices
The MSH issues an annual International Price Indicator Guide (http://erc.msh.org). It has two sections. The first section lists procurement prices offered by not-for-profit suppliers to developing countries for multi-source generically equivalent products. The second section lists tender prices offered to procurement agencies in developing countries. The number of suppliers listed for each product may vary. For each product, a mean and a median unit price is calculated. The median price is used in this manual as the international reference price. The tender price section is used only for products that have no procurement price.

Multi-source product
See Generic medicine.

Originator pharmaceutical product (brand)
See Innovator pharmaceutical product/innovator brand.

Patent
A title granted by the public authorities that confers a temporary monopoly for the exploitation of an invention upon the person who reveals it, furnishes a sufficiently clear and full description of it and claims this monopoly.

Patient co-payments
Payments by patients of a fixed amount per prescribed medicine, even if reimbursement applies.

Percentile
The range of values containing the central half of the observations: that is, the range between the 25th and 75th percentiles (the range including the values that are up to 25% higher or down to 25% lower than the median) is called the interquartile range. It is used with the median value (instead of the mean ± standard deviation) to report data that are markedly non-normally distributed. (Standard deviation: a measure describing the range of the data when using the mean.)

Pharmaceutical equivalence
Medicines with identical amounts of the same active ingredient in the same dosage form and route of administration, that meet the standards of strength, quality, purity, and identity.

Pharmaceutical product
Any medicine intended for human use, presented in its finished dosage form that is subject to control by pharmaceutical legislation (registered). A product may be sold under a brand name (e.g. Valium) or under the generic name (e.g. diazepam).

Procurement price
The price paid by the government, wholesalers and other purchasers to procure medicines. Different prices may be paid for the same product by a public sector purchaser, such as the Ministry of Health, the health facility that supplies the medicine to the patient, and the individual who purchases the medicine.

Rebate
Pharmacies may receive a bulk refund from the wholesaler, based on sales of a particular product. This is a discount on the retailer acquisition cost. It does not affect the price the patient pays, but the retailer mark-up will be higher.

Retailer
A company that sells goods to consumers. In the pharmaceutical sector, the retailer is the pharmacy or any other medicine outlet.

Many low- and middle income countries have at least two different types of shops in which medicines can be purchased: pharmacies with a registered pharmacist

and drug stores, chemists or medicine outlets with paramedical staff or lay people (often called the informal sector).

Retail mark-up
A percentage added to the purchasing price to cover the retailer's costs and profit.

Substance
See Active pharmaceutical ingredient.

Trade name
See Brand name.

Trade-Related Aspects of Intellectual Property Rights (TRIPS)
An agreement annexed to the World Trade Organization convention aimed at strengthening and harmonizing aspects of the protection of intellectual property at the global level. It includes trademarks and patents as well as other forms on intellectual property.

Wholesaler
A company that buys goods from a manufacturer or importer and sells it to retailers.

The number of wholesalers in the pharmaceutical sector varies between countries, from one state wholesaler to more than 500. The wholesaler may be an agent for one company only or deal with products from several companies. Manufacturers may also be wholesalers for their own products. In some countries, pharmacies may also have a wholesaler licence.

Wholesale mark-up
A percentage added to the purchasing price to cover the wholesaler's costs and profit.

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Listservs

ip-health: to subscribe, go to http://lists.essential.org/mailman/listinfo/ip-health

e-drug: to subscribe, go to http://www.essentialdrugs.org/edrug/subscribe.php or write to majordomo @usa.healthnet.org and in the body of the message type: subscribe e-drug

Annexes

Annex 1

Example of a letter of endorsement

To whom it may concern

Medicine price survey

Mr/Ms/Dr ..... (title and name of survey manager) of ..... (organization) will be undertaking a survey of medicine prices in ..... (area or districts) in ..... (month in which study will be undertaken). This requires the collection of price information at a sample of retail pharmacies and other medicine outlets, as well as the collection of information on price composition at different points in the supply chain, from manufacturer to consumer.

The survey follows methods promoted by the World Health Organization and Health Action International and is designed to help identify ways of improving the affordability of medicines in ..... (name of country). Supporting ..... (survey manager) in this work are ..... (Advisory Group member names and designations).

We understand that the results will be publicly available by ..... (likely date for completion of report) and that complete anonymity of individual pharmacies and medicine outlets will be assured. A prior appointment will be made with each pharmacy to be visited at a date and time convenient to staff.

On behalf of ..... (Ministry of Health or Pharmacy Association), I would be grateful if you would provide full access to the information needed for this survey.

Signed _____

Designation _____

Place _____

Date _____

Annex 2

National Pharmaceutical Sector form

Date _____

Population _____

Daily wage of lowest paid government worker _____

Rate of exchange (commercial "buy" rate)
to US dollars on the first day of data collection _____

Sources of information _____

General information on the pharmaceutical sector

Is there a formal National Medicines Policy document covering both the public and private sectors? ❑ Yes ❑ No

Is an Essential Medicines List (EML) available? ❑ Yes ❑ No

If yes, state total number of medicines on national EML: _____

If yes, year of last revision: _____

If yes, is it (tick all that apply):

- ❑ National
- ❑ Regional
- ❑ Public sector only
- ❑ Both public and private sectors
- ❑ Other (please specify):

If yes, is the EML being used (tick all that apply):

- ❑ For registration of medicines nationally
- ❑ Public sector procurement only
- ❑ Insurance and/or reimbursement schemes
- ❑ Private sector
- ❑ Public sector

Is there a policy for generic prescribing or substitution? ❑ Yes ❑ No

Are there incentives for generic prescribing or substitution? ❑ Yes ❑ No

Public procurement[1]

Is procurement in the public sector limited to a selection of essential medicines? ❑ Yes ❑ No

If no, please specify if any other limitation is in force: _____

Type of public sector procurement (tick all that apply):

- ❑ International, competitive tender
  - ❑ Open
  - ❑ Closed (restricted)
- ❑ National, competitive tender
  - ❑ Open
  - ❑ Closed (restricted)
- ❑ Negotiation/direct purchasing

[1] If there is a public procurement system, there is usually a limited list of items that can be procured. Products procured on international tenders are sometimes registered in the recipient country only by generic names. Import permits to named suppliers are issued based on the approved list of tender awards. An open tender is one that is publicly announced; a closed one is sent to a selection of approved suppliers.

Are the products purchased all registered? ❑ Yes ❑ No

Is there a local preference?[2] ❑ Yes ❑ No

Are there public health programmes fully implemented by donor assistance which also provide medicines? (e.g. TB, family planning, etc.) ❑ Yes ❑ No

If yes, please specify: _____

Distribution[3]

Is there a public sector distribution centre/warehouse? ❑ Yes ❑ No

If yes, specify levels: _____

Are there private not-for-profit distribution centres: e.g. missions/nongovernmental organizations? ❑ Yes ❑ No

If yes, please specify: _____

Number of licensed wholesalers: _____

Retail

	Urban	Rural	Overall
Number of inhabitants per pharmacy (approx.)			
Number of inhabitants per qualified pharmacist (approx.)			
Number of pharmacies with qualified pharmacists			
Number of medicine outlets with pharmacy technician			
Number of other licensed medicine outlets			

Private sector[4]

Are there independent pharmacies? ❑ Yes ❑ No Number: _____

Are there chain pharmacies? ❑ Yes ❑ No Number: _____

Do doctors dispense medicines?[5] ❑ Yes ❑ No

If yes, approximate coverage or % of doctors who dispense: _____

Are there pharmacies or medicine outlets in health facilities? ❑ Yes ❑ No

[2] A local preference means that local companies will be preferred even if their prices are not the cheapest. Local preference is normally in the range of 10–20%.

[3] The public sector often has a central storage and distribution centre which may have at least one sublevel. The private not-for-profit sector may be dominated by one type of NGO (e.g. church missions), but may also comprise others such as Bamako Initiative type projects, Red Cross or Red Crescent Society, Médecins Sans Frontières.

[4] Retail outlets may be called pharmacies, medicine outlets, drug stores, chemists, etc. They may be run/owned by a qualified pharmacist (with diploma) or another category: e.g. pharmacy technician, or a lay person with short training.

[5] Many countries allow doctors to dispense and sell medicines.

Financing

(Give approximate figures, converted to US dollars at current exchange rate: commercial "buy" rate on the first day of data collection)

Type of expenditure	Approximate annual budget (US dollars)
National public expenditure on medicines including government insurance, military, local purchases in past year	
Estimated total private medicine expenditure in past year (out of pocket, private insurance, NGO/mission)	
Total value of international medicine aid or donations in past year	

What percentage of medicines by value are imported? _____ %

Government price policy

Is there a medicines regulatory authority? ❑ Yes ❑ No

Is pricing regulated? ❑ Yes ❑ No

Is setting prices part of market authorization/registration? ❑ Yes ❑ No

Do registration fees differ between:

- Innovator brand and generic equivalents ❑ Yes ❑ No
- Imported and locally produced medicines ❑ Yes ❑ No

Public sector

Are there margins (mark-ups) in the distribution chain? ❑ Yes ❑ No

- Central medical stores _____ %
- Regional store _____ %
- Other store (specify) _____ %
- Public medicine outlet _____ %

Are there any other fees or levies? ❑ Yes ❑ No

If yes, please describe: _____

Private retail sector

Are there maximum profit margins? ❑ Yes ❑ No

If yes (if they vary, give maximum and minimum):

- Wholesale _____ %
- Retail _____ %

Is there a maximum retail price (sales price)? ❑ Yes ❑ No
(If it varies, give maximum and minimum)

- Maximum _____
- Minimum _____

Do patients pay professional fees (e.g. dispensing fee)? ❑ Yes ❑ No

If yes, please describe: _____

"Other" sector

Are there maximum profit margins? ❑ Yes ❑ No

If yes (if they vary, give maximum and minimum):

- Wholesale _____ %
- Retail _____ %

Is there a maximum sales price? ❑ Yes ❑ No

Insurance, risk-sharing or prepayment schemes

Are there any health insurance, risk-sharing or prepayment schemes or revolving medicine funds? ❑ Yes ❑ No

If yes, please describe: _____

Are all medicines covered? ❑ Yes ❑ No

If no, state which medicines are covered (e.g. EML, public health programmes):

_____

Are some patients / groups of patients exempted, regardless of insurance coverage? (e.g. children < X years, war veterans) ❑ Yes ❑ No

If yes, please specify: _____

Estimated percentage of population covered _____ %

Is it official policy to supply all medicines free at primary health care level? ❑ Yes ❑ No

If no, are some free? ❑ Yes ❑ No

If yes, tick all that apply:

- ❑ Tuberculosis
- ❑ Malaria
- ❑ Oral rehydration salts
- ❑ Family planning
- ❑ Others, please specify: _____

Are there official user charges/patient co-payments/fees? ❑ Yes ❑ No

Are all medicines supplied free at hospitals? ❑ Yes ❑ No

If no, are some free? ❑ Yes ❑ No

If yes, please specify: _____

Annex 3

Medicine Price Data Collection form

Use one form for each health facility and pharmacy

Date _____ Area number _____

Name of town/village/district _____

Name of health facility/pharmacy (optional) _____

Health facility/pharmacy ID (mandatory) _____

Distance in km from nearest town (population > 50 000) _____

Type of health facility:

❑ Public ❑ Private retail pharmacy

❑ Other (please specify): _____

Type of price in public and private not-for-profit sector:

❑ Procurement price ❑ Price the patient pays

Name of manager of the facility _____

Name of person(s) who provided information on medicine prices and availability (if different) _____

Data collectors _____

_____

Verification

To be completed by the area supervisor at the end of the day

Signed _____

Date _____

MEDICINE PRICE DATA COLLECTION FORM

Most sold: determined nationally

Lowest price: determined at facility

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recom-mended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Aciclovir tab 200 mg	Zovirax	GSK		25			/tab	
Most sold generic equivalent				25				
Lowest price generic equivalent				25				
Amitriptyline tab 25 mg	Tryptizol	MSD		100			/tab	
Most sold generic equivalent				100				
Lowest price generic equivalent				100				
Amoxicillin caps/tab 250 mg	Amoxil	SKB (GSK)		21			/tab	
Most sold generic equivalent				21				
Lowest price generic equivalent				21				
Artesunate tab 100 mg	Arsumax	Sanofi		20*			/tab	
Most sold generic equivalent				20*				
Lowest price generic equivalent				20*				
Atenolol tab 50 mg	Tenormin	AstraZeneca		60			/tab	
Most sold generic equivalent				60				
Lowest price generic equivalent				60				
Beclometasone inhaler 50 mcg/ dose	Becotide	GSK		1 inhaler: 200 doses			/dose	
Most sold generic equivalent				1 inhaler: 200 doses				
Lowest price generic equivalent				1 inhaler: 200 doses				
Captopril tab 25 mg	Capoten	BMS		60			/tab	
Most sold generic equivalent				60				
Lowest price generic equivalent				60				
Carbamazepine tab 200 mg	Tegretol	Novartis		100			/tab	
Most sold generic equivalent				100				
Lowest price generic equivalent				100				
Ceftriaxone inj 1 g powder	Rocephin	Roche		1 vial			/vial	
Most sold generic equivalent				1 vial				
Lowest price generic equivalent				1 vial				

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recom-mended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Ciprofloxacin tab 500 mg	Ciproxin	Bayer		1			/tab	
Most sold generic equivalent				1				
Lowest price generic equivalent				1				
Co-trimoxazole paed suspension (8+40) mg/mL	Bactrim	Roche		100 mL			/mL	
Most sold generic equivalent				100 mL				
Lowest price generic equivalent				100 mL				
Diazepam tab 5 mg	Valium	Roche		100			/tab	
Most sold generic equivalent				100				
Lowest price generic equivalent				100				
Diclofenac tab 25 mg	Voltarol	Novartis		100			/tab	
Most sold generic equivalent				100				
Lowest price generic equivalent				100				
Fluconazole caps/tab 200 mg	Diflucan	Pfizer		30			/tab	
Most sold generic equivalent				30				
Lowest price generic equivalent				30				
Fluoxetine caps/tab 20 mg	Prozac	Lilly		30			/tab	
Most sold generic equivalent				30				
Lowest price generic equivalent				30				
Fluphenazine decanoate inj 25 mg/mL	Modecate	Sanofi-Winthrop/ BMS		1 ampoule			/mL	
Most sold generic equivalent				1 ampoule				
Lowest price generic equivalent				1 ampoule				
Glibenclamide tab 5 mg	Daonil	HMR		60			/tab	
Most sold generic equivalent				60				
Lowest price generic equivalent				60				
Hydrochlorothiazide tab 25 mg	Dichlotride	MSD		30			/tab	
Most sold generic equivalent				30				
Lowest price generic equivalent				30				
Indinavir caps 400 mg	Crixivan	MSD		180			/caps	
Most sold generic equivalent				180				
Lowest price generic equivalent				180				
Losartan tab 50 mg	Cozaar	MSD		30			/tab	
Most sold generic equivalent				30				
Lowest price generic equivalent				30				

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	**Brand name(s)**	**Manufacturer**	**Available tick ✓ for yes**	**Pack size recom-mended**	**Pack size found**	**Price of pack found**	**Unit price (4 digits)**	**Comments**
Lovastatin tab 20 mg	Mevacor	MSD		60			/tab	
Most sold generic equivalent				60				
Lowest price generic equivalent				60				
Metformin tab 500 mg	Glucophage	Merck		100			/tab	
Most sold generic equivalent				100				
Lowest price generic equivalent				100				
Nevirapine tab 200 mg	Viramune	Boehringer I		60			/tab	
Most sold generic equivalent				60				
Lowest price generic equivalent				60				
Nifedipine Retard tab 20 mg	Adalat Retard	Bayer		100			/tab	
Most sold generic equivalent				100				
Lowest price generic equivalent				100				
Omeprazole caps 20 mg	Losec	AstraZeneca		30			/caps	
Most sold generic equivalent				30				
Lowest price generic equivalent				30				
Phenytoin caps/tab 100 mg	Epanutin	Pfizer		100			/tab	
Most sold generic equivalent				100				
Lowest price generic equivalent				100				
Pyrimethamine with sulfadoxine tab (25+500) mg	Fansidar	Roche		3			/tab	
Most sold generic equivalent				3				
Lowest price generic equivalent				3				
Ranitidine tab 150 mg	Zantac	GSK		60			/tab	
Most sold generic equivalent				60				
Lowest price generic equivalent				60				
Salbutamol inhaler 0.1 mg per dose	Ventoline	GSK		1 inhaler: 200 doses			/dose	
Most sold generic equivalent				1 inhaler: 200 doses				
Lowest price generic equivalent				1 inhaler: 200 doses				
Zidovudine caps 100 mg	Retrovir	GSK		100			/caps	
Most sold generic equivalent				100				
Lowest price generic equivalent				100				

* Based on treatment of malaria in an adult around 70 kg with artesunate as single treatment: 4 mg/kg for 7 days (WHO Model Formulary, 2002)

Annex 4

Example of a letter of introduction from the survey manager

To whom it may concern

Medicine price survey ..... (place and dates)

By this letter I would like to introduce to you ..... (name of area supervisor) and his/her team (details attached), as they begin to collect information from registered pharmacies and other sources on the price of selected medicines in your area.

This work is in accordance with methods promoted by the World Health Organization and Health Action International and endorsed by ..... (Ministry of Health and/or Pharmacy Association). The results will be made publicly available and the anonymity of individual pharmacies and individual respondents will be strictly maintained.

This work should contribute to better knowledge about retail price differences, both in the country and internationally. It should also help us to understand how these prices are determined and how we might better control them. As you are aware, the price of medicines is of great importance to all people.

The survey team's work consists of interviewing staff at a preselected sample of pharmacies about the prices and availability of 30 to 50 important medicines. Each pharmacy visit will probably take about two hours and we will try to ensure that the timing of the visit is convenient for you and your staff. Interviewers have specifically been asked to avoid arriving at peak times, when the pharmacy is busiest.

Should you need further information or have questions about this survey, please contact me directly. I would be grateful for every assistance you can provide to ..... (area supervisor) and his/her team in carrying out their work.

Signed _____

Designation _____

Place _____

Date _____

Attachments:

Full contact details of survey manager and commissioning organization
Names of all data collectors in survey area
Planned schedule of dates and times of visits to pharmacies
Full contact details of survey manager
Names and designations of Advisory Group members
Copy of letter(s) of endorsement

Annex 5

Example of a survey report

The prices people have to pay for medicines in Utopia

The Medicines in Utopia Network (MUN)

November 2002

Contents

Acknowledgements

Permission to undertake this survey was given by the Ministry of Health and the Utopia Pharmacy Association. Each health facility and pharmacy was given a number to ensure anonymity.

We wish to thank all the people who gave their precious time to provide data and the area supervisors and data collectors. We also wish to express our thanks to the Advisory Group:

Dr Lembu Kalala, Chief Pharmacist, Ministry of Health

Dr Talia Tumun, Utopia Medical Association

Ms Heni Surono, Utopia Pharmacy Association

Mr Ovia Taboro, Director, Central Medical Stores

Dr Subardan Aziz, District Medical Officer

Ms Mai Owino, Survey Area Supervisor, Ira District

Mr James Mpenda, Survey Data Analyst

[1] Note: In this example, Annexes are indicated but not included.ß

Executive summary

The Medicines of Utopia Network has carried out a field study to measure the prices of medicines in Utopia using an international standardized methodology. Data on prices for 35 medicines were collected in the public and private for-profit sector in the capital, Tata, and in the three districts of Ira, Baya and Nona. The availability of the medicines was also measured. The cost of treatment was calculated for ten medicines and compared to the daily wage of the lowest paid government worker. In addition, we also identified the components of medicine prices.

The results showed that in Utopia, where 80% of the population live on less than one US dollar per day, the prices of medicines are high, making essential medicines unobtainable for many. Even in the public sector, there is a charge of around 30%. Because the prices obtained by public procurement are reasonable, however, the resulting price to the patient is much lower than in the private sector. Private sector prices are considerably higher and prescribers in this sector possibly use innovator brands more extensively, resulting in unaffordable treatment for most people. The prices of innovator brands are considerably higher than the prices of their generic equivalents. The prices of generic medicines also vary and the cheapest product is not always the most sold.

For a basic monthly treatment for diabetes, for example, the price may be as high as 7.4 days' wages for an innovator brand. Part of the problem is relatively high duties, tariffs and mark-ups.

Summary of Recommendations

1 The government should carefully consider a policy favouring the use of generic medicines by stimulating generic prescribing, increasing consumer awareness and acceptance of generic equivalents and introducing incentives for pharmacists to comply with a policy on generics.

2 The government should take steps to reduce the burden of duties, taxes and mark-ups. One option would be to replace an uncontrolled percentage mark-up with a fixed dispensing fee and a fixed, lower mark-up. Introducing and enforcing compliance with maximum mark-ups in the private sector is a further measure that could be undertaken.

3 The central medical stores should be made a wholesaler of essential medicines also for the private sector: for example, by transforming it into an autonomous state wholesaler.

4 The government should use the findings of this study for more in-depth reviews of policy options.

1 Introduction and background

During the months of October and November 2002, a field study on measuring the prices of medicines was carried out in Utopia. The goal of the study was to document and compare the prices of medicines in the different parts of the health sector and to compare them with those in other countries.

The field work carried out is based on a methodology developed by the World Health Organization (WHO) and Health Action International (HAI) using a short list of medicines to compare the prices of medicines in different health sectors. The methodology, which is described in the manual, *Medicine Prices: A new approach to measurement* (WHO/HAI, 2003), has been designed for the collection, analysis and interpretation of medicine prices in a standardized way. It also enables the composition of medicine prices to be investigated.

The objectives of our study were to answer the following questions:

- How are medicines priced in Utopia?
- What is the difference in the prices of innovator brand products and generic equivalents?
- What taxes and duties are levied on medicines and what is the level of the various mark-ups that contribute to the retail price of medicines?
- How affordable are medicines to low-income people in Utopia?

The study was carried out by the Medicines in Utopia Network with permission from the Ministry of Health. The resulting report is distributed to the Ministries of Health and Finance, the Utopia Pharmacy Association and the Utopia Medical Association.

Country data

Utopia has a population of 20 million, 65% of whom live below the poverty line. The GNP per capita is 200 US dollars. Public health services cover an estimated 80% of the population, but services are not completely free; there is, for example, a fee per prescription which goes into a revolving medicines fund. There is no public insurance, but people over the age of 65 and children below 5 years receive free health services.

There are an estimated 500 private pharmacies, mainly in the larger cities. Doctors are allowed to dispense medicines, but the size of the "market" is not fully known. There are a few small nongovernmental organizations in the health sector. In the public sector, there is an Essential Medicines List and medicines are procured by use of international tenders. There is currently no patent law. The national medicines policy is still in draft form. The information gathered on the health and pharmaceutical sectors during this survey is attached as Annex I.

2 Methods

MUN decided to look at the prices of a number of essential medicines in the public sector and private pharmacies. A total of 35 substances were included in the survey. Of these, 30 medicines were preselected as core medicines for international comparison and five were added by us as a supplementary list. The list is attached as Annex II.

For each substance, up to three products were monitored, namely:

- Innovator brand
- Most sold generic equivalent
- Lowest price generic equivalent.

The prices were measured centrally and in health facilities and pharmacies in the capital, Tata, and in three randomly selected districts: Ira, Baya and Nona. We also looked at two prices in the public sector:

- Procurement prices
- Prices charged to patients.

In all sectors we also measured the availability of the medicines at the time of data collection. The use of an international reference price for standardized international comparison is explained under "Results". All prices were converted to US dollars using the exchange rate (buying rate) on 1 November 2002, the first day of the survey.

We also identified the components of medicine prices in order to make an estimate of the manufacturers' prices.

Finally, in order to find out what prices of medicines mean to the ordinary citizen, we measured the costs of some common treatments and compared them with the daily wage of the lowest paid government worker.

Sampling

In order to obtain the data, we used the sampling method described in the WHO/HAI manual for selecting a representative number of public health facilities and pharmacies. A total of 20 public sector health facilities and 20 pharmacies in Tata and the three randomly selected districts were included. This sample would ensure that a sound statistical analysis could be performed if the selected medicines were widely available.

The methodology described in the manual allows for more sectors to be included, such as the private not-for-profit (NGO) sector. We decided not to include this sector because it is small and fragmented in Utopia.

Finalizing the list of medicines

The 30 medicines on the core list do not correspond very well with the Essential Medicines List of Utopia which sometimes recommends other pharmaceutically equivalent substances or other strengths. For this reason and because we also wanted to monitor some medicines used for treating parasitic infections, we added the following substances:

- Amoxicillin tab 500 mg (different strength from the one on the core list)
- Amoxicillin-clavulanic acid tab 250+125 mg (more commonly used than amoxicillin)
- Enalapril tab 20 mg (on the Utopia Essential Medicines List instead of captopril)
- Albendazole tab 400 mg
- Metronidazole tab 250 mg.

3 Data collection

We found data on public procurement prices (tender prices) and availability at the Central Medical Stores. At the public health facilities, we checked the availability of the list of medicines and the prices patients had to pay. The prices in private pharmacies were obtained by visiting the selected pharmacies. Price components were identified by interviewing relevant bodies. A standardized data collection form was used and data collectors were trained in a two-day workshop to ensure the reliability and reproducibility of the survey. A small pilot study was also undertaken.

The survey team consisted of health related representatives from the capital and the three districts included in the survey. Each team (one per district) had one supervisor. Data collection was completed in three weeks.

4 Results

The following analysis will be presented.

4.1 Median medicine price ratios for innovator brands and generic equivalents, in the private-for-profit sector in comparison with international reference prices.

4.2 Median medicine price ratios in the public sector in comparison with international reference prices.

4.3 The comparative medicine price ratios in the public and private for-profit sectors.

4.4 Price variations in Utopia.

4.5 The availability of the medicines on the day of data collection.

4.6 The affordability for low-income people of treatment regimens from the public and private-for-profit sectors for selected common conditions with innovator brand, most commonly sold generic and lowest price generic medicines.

4.7 The cumulative level of domestic duties, taxes and mark-ups as it adds on to the ex-manufacturer's price and which people have to pay in the form of the final retail medicine price.

4.8 Medicines prices in Utopia in an international perspective.

Most of the results will be presented as comparison with international reference prices (IRP). There will be a summary of the median price ratios of all medicines monitored (median of the median price ratios) and the size of the variation between facilities. The size of the difference between the price representing 25% of the median price and the price representing 75% of the median price will indicate the price variability between facilities.

The international reference price used is the median price for generic medicines quoted from one or more international non-profit wholesalers to public or non-profit procurement agencies. The source for these prices is the Management Sciences for Health database. The price is FOB (free on board). With efficient public procurement, our public net price ratios (no patient charge added) should be around one: i.e. close to the international reference price.

The report will also highlight some findings relating to individual prices in the different sectors monitored as well as between the prices of innovator brand medicines, most sold generic equivalents and lowest price generic equivalents in the facilities monitored. The reason for measuring both the most sold and the cheapest generic equivalents is to highlight any significant differences between what people would have paid if the lowest price generic equivalent had been prescribed and the one that is the most prescribed. In the public sector, generally only one price for each substance was found.

4.1 Medicine prices in the private for-profit sector (private pharmacies)

Table 1 Summary of median price ratios, private for-profit sector, all 35 medicines

In the private for-profit sector, when medicine prices were compared with the international reference prices for generic medicines, the 35 innovator brand products were found to be priced at 16 times the international reference prices. Fifty percent of the innovator brand medicines surveyed were in the range of 8.2 to 36.3 times the reference prices.

	No. of substances found (availability)	Median price ratio	25th percentile	75th percentile
Innovator brand	30 (85%)	15.90	8.22	36.30
Most sold generic equivalent	25 (71%)	3.65	1.48	6.37
Lowest price generic equivalent	22 (63%)	1.63	1.39	3.61

For the generically equivalent products, the difference in price between the most sold and the cheapest was not so large; some substances were not available as more than one generic product and have, for the sake of analysis, been entered both as the most sold and lowest price generic equivalents. The median price of the most sold generic equivalents was 3.7 times the international reference price, with 50% of the medicines being sold in the range of 1.5 to 6.4 times the reference prices. The median of the median price ratio of the lowest price generic equivalents was 1.6 times the international reference price, with 50% of the medicines being sold in the range of 1.4 to 3.6 times the reference prices.

Table 2 Examples of medicine price ratios

Generic name		Median price ratio	25th percentile	75th percentile
Amitriptyline 25 mg	Innovator brand	14.11	13.63	16.06
	Most sold generic equivalent	2.02	1.95	2.21
	Lowest price generic equivalent	1.72	1.53	2.04
Amoxicillin 250 mg	Innovator brand	22.38	22.35	22.48
	Most sold generic equivalent	10.78	10.78	10.88
	Lowest price generic equivalent	9.92	9.91	10.36
Diclofenac 25 mg	Innovator brand	48.56	44.64	53.65
	Most sold generic equivalent	7.83	6.27	7.83
	Lowest price generic equivalent	7.83	6.27	7.83
Glibenclamide 5 mg	Innovator brand	38.70	11.61	46.44
	Most sold generic equivalent	6.39	5.32	7.74
	Lowest price generic equivalent	6.39	5.32	7.74

For a number of medicines, there was very little variation in price when comparing the most sold or lowest price generic equivalents. In general, however, the innovator brand product was about 2 to 4 times the price of the most sold generic equivalent and, in some cases, was as high as 10 times.

When comparing the prices of all the medicines (Annex III), the cheapest and most expensive items were found to be 2.3 times and 126 times the international reference price respectively. The lowest price generic equivalent was found to be 1.5 times the international reference price, while the most expensive generic equivalent was 8 times the same reference price.

4.2 Medicine prices in the public sector

Table 3 Examples of price ratios and summary price ratios in the public sector (procurement and facility prices to patients)

	Procurement price ratio	On Essential Medicines List	Price to patients ratio	Availability in facilities
Amoxicillin 250 mg	1.54	yes	1.31	90%
Ceftriaxone 1 g inj	3.37	no	1.72	35%
Glibenclamide 5 mg	4.84	yes	5.19	90%
Summary price ratio/ average availability	1.29	55%	1.64	38%

A summary ratio of 1.29 in public sector procurement (i.e. 29% above the international free on board (FOB) reference price) is reassuring for procurement officers as the comparison is between an FOB price and a price which includes cost, insurance and freight (CIF).

The median of the summary of price ratios of prices charged to patients (1.64) compared with the summary ratios of the tender prices (1.29) indicates that the average mark-up and taxes in the public sector amounts to around 30%.

4.3 Comparative medicine price ratios in the public and private sectors

Table 4 Summary data

	Public Median price ratio	For-profit Median price ratio	vs Public
Innovator brand	3.37 (1 item)	15.90	
Most sold generic equivalent	1.64	4.65	283.8%
Lowest price generic equivalent	1.64	2.63	99.0%

As only one innovator brand product was found in the public sector, the comparison of innovator brands between the sectors becomes irrelevant and we have compared only the prices of generic equivalents.

For the public sector, the overall price of the generic medicines surveyed was 29% above the international reference price. However, the median of private sector innovator brand prices was 16 times the international reference price. The prices charged for the most sold generic medicines in the private sector were almost three times the prices in the public sector, while the prices of the lowest price generic equivalents were less than double the public sector patient prices.

When comparing the prices that patients pay in each sector, it is clear that the prices are lowest in the public sector. In the private sector, even the cheapest generic medicines cost 60% more than the prices paid by patients in the public sector. It was beyond the scope of this survey to identify whether innovator brands or the most sold generic equivalents are the most widely sold products in the private sector.

The examples in Tables 5 and 6 are included to illustrate the situation by using data on individual medicines. Price ratios are used in Table 5; in Table 6 (opposite), actual prices are given in Riras (R) and the different products are listed by their sales names. Again, the data reveal large differences between the two sectors, but also between innovator brand products and generic equivalents in the private pharmacies.

Table 5 Comparing price ratios between the two sectors for individual products

Generic name	Type	Private	Public
Diclofenac 25 mg	Innovator brand	48.56	NA
	Most sold generic equivalent	7.83	4.27
	Lowest price generic equivalent	3.15	4.27
Glibenclamide 5 mg	Innovator brand	38.70	NA
	Most sold generic equivalent	6.39	5.19
	Lowest price generic equivalent	6.39	5.19

4.4 Availability

The average availability of medicines was 38% in the public sector and 85% on innovator brands and 71% on the most sold generic medicines in the private sector. One explanation for low availability in the public sector is that Utopia has an Essential Medicines List which does not correspond fully with the core list used in the survey. Although a few essential medicines have been added by use of the supplementary list, average availability remains low. Stock-outs caused by poor estimations of consumption or cashflow problems are other possible explanations, although it has to be remembered that our estimate is based on a one point in time investigation.

Table 6 Comparing actual prices between the two sectors for 100 units of individual products

Generic name	Type	Product name	Private	Product name	Public
Diclofenac 25 mg	Innovator brand	Voltaren	6347.00		NA
	Most sold generic equivalent	Dicloren	1021.00	Diclofenac Pharma	555.00
	Lowest price generic equivalent	Diclofenac Ratio	957.50	Diclofenac Pharma	555.00
Glibenclamide 5 mg	Innovator brand	Daonil	3870.00		NA
	Most sold generic equivalent	Glibenclamide Celsius	639.00	Glibenclamide Medifarm	519.00
	Lowest price generic equivalent	Glibenclamide Celsius	639.00	Glibenclamide Medifarm	519.00

In Utopia, the public sector is said to cover 80% of the population, but the survey identified problems of availability. It means that many people will either have to go without treatment or to spend considerably more to purchase medicines in the private sector.

4.5 Affordability

A full list of the 10 conditions for which the affordability of treatment was measured is included as Annex IV. The monthly salary of the lowest paid government worker was R8000: i.e. R267 per day. Table 7 illustrates the affordability of treatment in the public sector and the private sector for one acute and one chronic condition.

Table 7 Cost of treatment for pneumonia and diabetes

Treatment	Type	Public sector		Private pharmacies	
		Median price	Days' wages	Median price	Days' wages
Pneumonia: Amoxicillin 250 mg x 3 for 7 days	Innovator brand	NA		2510.00	9.4
	Most sold generic equivalent	106.80	0.4	1201.00	4.5
	Lowest price generic equivalent	106.80	0.4	1121.00	4.2
Diabetes: Glibenclamide 5 mg x 2 for 30 days	Innovator brand	NA		2322.00	8.7
	Most sold generic equivalent	311.40	1.2	383.40	1.4
	Lowest price generic equivalent	311.40	1.2	383.40	1.4

For a course of innovator brand amoxicillin to treat pneumonia, a patient would need to pay the equivalent of 0.4 days' wages of the lowest paid government worker to purchase a course of therapy from public sector health facilities. In the private-for-profit sector, the cost expressed in days' wages would be 9.4 for the innovator brand and 4.5 or 4.2 days' wages for the two forms of the generic equivalent. It is important to bear in mind that these costs refer only to the medicine component of the total treatment costs. Consultation fees and diagnostic tests may mean that the total cost to the patient is considerably higher. For a one month course of glibenclamide to treat diabetes, a patient would need to pay 1.2 days' wages in the public sector. In the private pharmacies, the cost expressed in days' wages would be 8.7 days for the innovator brand and 1.4 days for the generically equivalent product.

4.6 Price components and cumulative mark-up

We measured price components for medicines in the public and private sectors, both imported and locally produced products, to study differences in mark-ups and to assess the impact of tariffs, taxes and mark-ups on the price the patient pays. Table 8 presents the price components of an imported product in the private sector and a locally produced generic equivalent purchased on the public tender. The result is given both as percentage add-ons and cumulatively. Annex V shows the price components of three medicines.

Table 8 Price components and cumulative mark-up for one imported and one locally produced medicine

Component	Imported product private sector		Locally produced generic equivalent, public sector tender	
	%		%	
Import price (index price)		100.00		100.00
Import duty	10%	110.00		
Port charges	1%	111.10		
Clearance and freight	2%	113.32		
Pre-shipment inspection	1.2%	114.68	1.2%	101.20
Pharmacy Board fee	2%	116.97	2%	103.22
Wholesale mark-up	22%	137.22	5%	108.38
Retail mark-up	35%	185.25	15%	124.64
VAT	3%	198.43	3%	128.38
Sales price		**198.43**		**128.38**
Total add-ons		**98.43**		**28.38**

For imported innovator brands and generic medicines, the price components are the same; the add-ons to the import price (Free On Board) almost double the price. The first three charges (13%) would not be included in the price of locally produced generic medicines in the private sector (not shown in the table), but the price would still increase by 75%. The mark-ups are lower in the public sector so the add-ons constitute less than 30% of the final price. A value added tax is applied, but this does not make a large impact as it is only 3%. There is no ceiling on wholesale and retail mark-ups. The 22% and 35% figures for wholesale and retail mark-ups respectively are estimations based on interviews and data for selected medicines.

The questionnaire on the national pharmaceutical sector indicates that there is no policy of tax exemption for essential medicines in either the public or private sectors. The main difference between sectors is the size of the mark-ups. The public sector distribution fees amount to 5% charged at the central level and 15% at local level.

4.7 National prices in an international perspective

Table 9 Price ratio for aciclovir in private sector in Utopia compared to three comparable developing countries and one industrialized country

Aciclovir Median price ratio	**Utopia**	**Distopia**	**Myopia**	**Xenopia**	**Faropia (OECD)**
Innovator brand	53.05	42.70	42.00	42.10	31.30
Most sold generic equivalent	NA	6.30	7.85	12.30	21.20

Only the innovator brand is on the market in Utopia. Table 9 shows the price to be higher than in countries with the same level of GNP per capita, but where there is more generic competition. In the industrialized country (Faropia), the considerably lower price can be attributed to price control mechanisms and generic competition. If compared to purchasing power, the difference will increase more than 10-fold.

Table 10 shows the prices of two medicines in the private sector, with real prices converted to US dollars for comparison. Whilst Utopia and comparable countries come out favourably for glibenclamide, the prices of diclofenac are considerably higher than in an industrialized country. Again, if compared to purchasing power, the differences would increase more than 10-fold.

Table 10 Prices in US dollars for 100 units of glibenclamide and diclofenac in the private sector in Utopia compared to three comparable countries and one industrialized country

Generic name/type	**Utopia**	**Distopia**	**Myopia**	**Xenopia**	**Faropia (OECD)**
Glibenclamide					
Daonil	12.72	11.63	11.35	10.30	14.62
Most sold generic equivalent	2.11	5.12	3.72	3.17	6.73
Diclofenac					
Voltaren	20.88	18.05	17.81	19.52	7.30
Most sold generic equivalent	3.36	3.60	3.82	2.95	4.39

Discussion

Our survey of medicines prices in Utopia shows large differences in the prices of the same generic substance between the public and the private for-profit sectors and between innovator brand products and their generic equivalents. This is a common finding in poor countries with unregulated or poorly regulated pharmaceutical sectors. The differences in price between innovator brand products and generic equivalents were found to be as high as 10 times; one item was found to be as high as 126 times that of the international reference price. Prices in the public sector are consistently lower than in the private sector, but availability is low and will force patients to use the more expensive private sector.

The low availability of medicines in the public sector is not uncommon in developing countries, but is still unacceptable as this is the sector where poor people would hope that some, if not all, of the cost would be covered. The cause of this low availability should be investigated. Can this be explained by the use of different therapeutically equivalent medicines in Utopia? Other factors must be considered, however, since there was also low availability of the medicines on the supplementary list, which contained some of the medicines on the Utopian Essential Medicines List. Possible explanations include inefficiency in the public sector or a lack of funding.

Measured in terms of affordability, the cost to the patient would vary considerably: there is, for example, a 20-fold difference between the price of the innovator brand in the private sector and the most sold generic equivalent in the public sector for the antibiotic amoxicillin and 8-fold for the antidiabetic glibenclamide.

As indicated earlier, prices varied considerably between the public and private sectors and between innovator brands and generic medicines. The findings so far suggest that prices also vary considerably between private pharmacies, as indicated by the 25th and 75th percentiles.

When compared with other countries, the findings of this survey suggest that the prices of medicines are high in Utopia, even in comparison with other low-income countries. The comparison also supports findings from other studies that manufacturers do not price their medicines according to countries' purchasing power and that they do not regard low-income countries as interesting markets in which they could achieve increased sales through lower prices.

The low availability of the medicines included in the study, particularly in the public sector but also in some private sector pharmacies, affects the reliability of the data. It may therefore be suggested that the study does not give an accurate picture of the situation in Utopia. However, the price variations are so large that the main conclusions are not affected to any noticeable degree.

Utopia has a small and fragmented private not-for-profit sector that we decided not to monitor. We are of the opinion that this will only marginally affect the results. Of more concern are dispensing doctors in the private sector. The size of this sector and the prices charged are not known and should be studied using exit interviews or household surveys.

One limitation to medicine price studies, such as the present one, is the quality of the products surveyed. In the present study, all products were registered in Utopia so we assume they were of acceptable quality. However, since no quality control testing was performed, we cannot say whether any of the products were substandard. If the quality of medicines is considered a possible problem, it could be addressed in any follow up to the study.

The pharmaceutical sector is a difficult sector to manage in many countries. In contrast to other markets, the pharmaceutical sector will be different because the person prescribing the treatment is different from the payer. The payer, who in developing countries is often the patient, therefore depends on decisions made by people who are either not interested in prices or are interested in making as much money as possible. This is why most countries regulate the sector through appropriate laws and regulations and ensure enforcement through such mechanisms as inspections.

5 Conclusions and recommendations

The principal conclusions of the study are as follows.

- Utopia's public health sector is relatively efficient in procurement and charges reasonably low prices to patients
- The availability of medicines in the public sector is far from optimal, however, and many people are forced to use the expensive private sector or go without treatment
- Prices are considerably higher in the private sector and innovator brands are possibly used more extensively as there are no incentives to prescribe and sell generic equivalents, resulting in treatment being unaffordable for most people

- The prices of innovator brands are considerably higher than the prices of their generic equivalents
- The prices of generic medicines also vary and the cheapest generic equivalent is not always the most sold
- The current medicines policy is taxing the poor. The taxes, tariffs and mark-ups are relatively high and contribute to making many medicines unaffordable for the majority of patients.

On the basis of the findings of the study, the following recommendations are made to the Government of Utopia.

1 The findings of this study should be used to adjust the draft national medicines policy.

2 An extended survey should be undertaken to ascertain the reasons for the low availability of medicines in the public sector.

3 An in-depth study of the private sector should be initiated to investigate:
   - Prescribing practice, including whether innovator brands are more frequently prescribed than the most sold generic equivalents
   - Any discrepancies between private sector retail prices measured in this survey, based on information from pharmacists, and the prices people actually pay, based on exit interviews or household surveys
   - The size of the "dispensing doctors" sector.

4 Steps should be taken to reduce the burden of duties, taxes and mark-ups on medicines. Policy options include:
   - Replacing an uncontrolled percentage mark-up with a fixed dispensing fee and a fixed, lower mark-up
   - Introducing and enforcing compliance with maximum mark-ups in the private sector, both wholesale and retail.

5 A policy favouring the use of generic medicines should be introduced. Policy options include:
   - Promoting generic prescribing
   - Introducing incentives for pharmacists to comply with a generics policy by replacing some of the percentage mark-up with a dispensing fee
   - Introducing price control mechanisms to reduce price variations in pharmacies
   - Increasing consumer awareness and acceptance of the availability of generic medicines as prescription only medicines are often also sold without prescription.

6 High manufacturers' prices in the private sector should be reduced. Policy options include making the Central Medical Stores a wholesaler of essential medicines for the private sector as well as the public sector: for example, by transforming it into an autonomous state wholesaler.

7 The impact of policy changes should be measured by regular surveys of medicine prices.

Such a study using basic indicators cannot give a complete picture of the pharmaceutical sector in Utopia. However, it is the hope of the Medicines in Utopia Network that the findings and recommendations of this report will be studied and form the basis for an in-depth examination of the pharmaceutical sector in Utopia in order to improve access to and affordability of medicines for all.