



Ministry of Health and
Quality of Life



World Health Organisation



Mauritius Institute of
Health

Mauritius Institute of Health
in collaboration with the
Ministry of Health & Quality of Life

**Medicine Prices, Availability,
Affordability and Price
Components in the Republic of
Mauritius**

*Report of a survey conducted in August
2008*

Powder Mill, Pamplemousses
Mauritius
February 2009

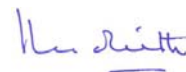
Foreward

The health services in the Republic of Mauritius consist of a public and a private sector. The public sector is made of a network of health centres and hospitals, capable of providing comprehensive health care to the entire population. The financing of this system is through taxation, that is, all services including supply of medicines are free of charge to the user. The Government spends around 10% of its recurrent health budget on purchase of medicines. In the private sector the services of health practitioners, including those of pharmacists, involve payment of fees by individuals or by an insurance scheme on their behalf.

In Mauritius, the per capita annual expenditure on medicine is approximately US \$ 50. Medicine costs dominate households' out of pocket expenditures, at over 50% of the total among a large majority of the households.

Studies and data on availability, prices and affordability of medicines in Mauritius are scant. This study on medicine prices provides comprehensive information in order to assess, on one hand, the availability and procurement system in the public sector and on the other, the availability, prices, price structure and affordability in the private sector. The results and recommendations will help take necessary actions to further improve availability and affordability of essential medicines to all.

I wish to acknowledge the contributions of all people and organisations that contributed in the implementation of the Medicine Prices Survey in Mauritius. In particular my thanks, go to the World Health Organisation for its financial and technical assistance, the Health Action International for providing technical support in the survey methodology, the members of the Advisory Group, as well as the Survey Managers and his team.



Dr J.C. Mohith
Executive Director
Mauritius Institute of Health

November 2008

Table of Contents

	<i>Page</i>
Acknowledgements	i
Conflict of Interest Statement	i
Executive Summary	ii
Project Team	v
Abbreviations	vi
List of Tables	vii
List of Figures	viii
1. INTRODUCTION AND BACKGROUND	1
1.1 Introduction	1
1.2 Country background	1
1.3 Health sector	2
1.4 Pharmaceutical sector	3
1.4.1 <i>National medicines (Drugs) policy</i>	3
1.4.2 <i>Regulatory system</i>	3
1.4.3 <i>Medicines supply system</i>	4
1.4.4 <i>Medicines financing</i>	4
1.4.5 <i>Rational use of medicines</i>	5
2. METHODOLOGY	6
2.1 Overview	6
2.2 Selection of medicine outlets	6
2.3 Selection of medicines to be surveyed	9
2.4 Data collection	9
2.5 Data entry	10
2.6 Data analysis	10
2.7 Price components survey	11
3. RESULTS	14
3.1 Availability of Medicines on the day of data collection	14
3.2 Public sector procurement prices	16
3.3 Private sector patient prices	16
3.4 Regional analysis	19
3.4.1 <i>Comparison of availability of medicines in the public sector across the six regions surveyed</i>	19
3.4.2 <i>Comparison of availability of medicines in the private sector across the six regions surveyed</i>	20
3.4.3 <i>Comparison of prices in the private sector across the six regions surveyed</i>	20
3.5 Affordability of standard treatment regimens	21

3.6	Price components	23
3.6.1	<i>Government policies and regulations that affect price components</i>	23
3.6.2	<i>Price components data collected for individual medicines</i>	24
3.7	International comparisons	26
3.7.1	<i>International comparisons of public sector procurement prices</i>	26
3.7.2	<i>International comparisons of private sector prices</i>	27
3.7.3	<i>International comparisons of private sector availability</i>	29
3.7.4	<i>International comparisons of private sector affordability</i>	30
3.7.5	<i>International comparisons of medicine price components</i>	31
4. DISCUSSION		32
5. RECOMMENDATIONS AND CONCLUSION		36
1.	Availability	36
2.	Procurement	36
3.	Pricing	36
4.	Affordability	36
ANNEXES:		37
Annex 1:	List of core and supplementary medicines	37
Annex 2:	Medicine data collection form	39
Annex 3:	Explanatory note on availability data	45
Annex 4:	Availability of individual medicines, public and private sectors	47
Annex 5:	Median price ratios, public sector procurement prices	49
Annex 6:	Median price ratios, private sector patient prices	51

Acknowledgements

We are grateful to the Ministry of Health and Quality of Life for their permission to conduct the study.

We also wish to extend our thanks to the Advisory Group:

- Dr R. Munbodh WHO Liaison Officer WHO Office Port- Louis
- Dr J.C Mohith Executive Director MIH
- Dr N. Jaypaul Director Health Services MOH & QL
- Mrs. S. Jankee Acting Director Pharmaceutical Services MOH & QL
- Mr. V. Chummun President Mauritius Pharmaceutical association
- Mr. J. Chellum President Mauritius Consumers' Association

We are grateful to Mr. G. Requin, Ex-Director Pharmaceutical Services, MOH&QL particularly for his contribution in the selection of medicines to be surveyed.

We are thankful for the cooperation and participation of the pharmacists and other staff at the medicine outlets where data collection took place. Our thanks also go to Mr. Along Siow, Departmental Head, Commission for Health, Prisons/Reform Institutions Cooperatives and Fire Services, Rodrigues and Dr Goorah, Director for Health Services Queen Elizabeth Hospital, Rodrigues for their collaboration in data collection in Rodrigues.

Health Action International and the World Health Organization provided technical support for the survey and their assistance is gratefully acknowledged. We would also like to thank the following individuals whose assistance was invaluable to the study:

- Mr. Abayneh Tamer Desta Technical Officer, WHO Regional Office for Africa
- Mr. Martin Auton WHO/HAI Consultant

Last but not the least we wish to thank the World Health Organization for funding this project.

Conflict of Interest Statement

None of the authors of this survey or anyone who had influence on the conduct, analysis or interpretation of the results has any competing financial or other interests.

Executive Summary

Background:

A field study to measure the price, availability, affordability and price components of selected medicines was undertaken in Mauritius in August 2008 using a standardized methodology developed by the World Health Organization and Health Action International.

Methods:

The survey of medicine prices and availability was conducted in six regions: the five health regions of the Island of Mauritius and Rodrigues. Data on 50 medicines were collected in 30 public and 30 private sector medicine outlets selected using a validated sampling frame. Data were also collected on government procurement prices. For each medicine in the survey, data were collected for the originator brand and lowest priced generic equivalent (generic product with the lowest price at each facility). Medicine prices are expressed as ratios relative to Management Sciences for Health international reference prices for 2006 (median price ratio or MPR). Using the salary of the lowest-paid unskilled government worker, affordability was calculated as the number of days' wages this worker would need to purchase standard treatments for common conditions.

The price components survey included two types of data collection: central data collection on official policies related to price components, and tracking specific medicines through the supply chain to identify add-on costs. Seven medicines were tracked backwards through the distribution chains in the private sector and in one survey area to identify the add-on costs that contribute to final price.

Key results:

Availability of medicines in the public and private sector:

- Generics were the only product type available in the public sector and its mean availability was 68.6%. In the private sector, the mean availability of originator brand and that of generic medicines were 55.7% and 54.9%, respectively.

Public sector procurement prices:

- In the public sector, the procurement agency was purchasing medicines at prices which were 34% less than the international reference prices and 75% medicines were procured less than 0.99 times the IRP, indicating a good level of purchasing efficiency.

Private sector patient prices:

- Final patient prices for originator brands and lowest priced generics in the private sector are 19.28 and 5.93 times their international reference prices, respectively.
- When originator brand medicines are prescribed/dispensed in the private sector, patients pay about 324% more than they would for generics.
- Generic medicines were priced more than nine times higher in the private sector than in the public sector (*Public sector procurement prices*).

Affordability of standard treatment regimens:

- In treating common conditions using standard regimens, the lowest paid government worker (with a monthly salary of MUR 6425) would need one day's wage or less to purchase lowest priced generic medicines from the private sector. If originator brands are prescribed and dispensed, costs rise to between 2 and 8 days' wages.

Components of medicine prices in the private sector:

The price paid for a medicine comprises a number of price components, the manufacturer's selling price (MSP) being one of them. As medicines move along the supply chain, from the manufacturer to the patient, additional costs are added to the MSP. These price components come from a variety of sources such as freight costs, insurance, local charges, wholesale mark up and retail mark up.

- Cumulative % mark-ups on fob price for individual medicines ranged from 40.11% to 63.90%.
- Add-on costs contribute a fair amount to the final price of medicines, ranging from 1% to 18% for individual medicines. Total add-on costs do not vary by product type or region.
- Manufacturer's Selling Price (MSP) is the main contributor to the retail price. The other components with the major contributions to final price are retail mark-up (18% of final price) and wholesale mark-up (8% of final price).

Conclusions:

The survey provides broad insight into issues related to price, availability and affordability of key medicines in Mauritius. The results highlight priority areas for action for the Ministry of Health and Quality of Life and other players in further improving access to and affordability of medicines for all. This requires multi-faceted interventions, as well as the review and refocusing of policies, regulations and educational interventions.

Recommendations:

Based on the results of the survey, the following recommendations can be made for improving the availability, price and affordability of medicines in Mauritius:

Availability

1. There is a need for the development of a policy to allow for generic substitution.
2. Strong advocacy in practice of generic prescribing and generic substitution need to be undertaken through national campaigns to promote improved drug availability in the interest of better patient care.
3. Appropriate steps should be taken to improve availability of medicines in the private sector in Rodrigues.

Procurement

1. Use of International Reference Prices as benchmark should be encouraged for ensuring lower procurement prices in the Government Sector.
2. Maintain and improve efficiency of public procurement system

Pricing

1. Overhauling of the pricing policy mechanism is required in order to achieve a greater level of transparency, uniformity and predictability in the pricing of medicines.
2. Development of a Medicines Price Index for monitoring and assessment of medicine prices on a regular basis.
3. Adopting a suitable pricing system with a view to further improve availability and affordability:

Affordability

1. To monitor and assess the Manufacturer's Selling Price with a view to improving access of medicines to the population.
2. Awareness creation and promotion of generic acceptance in the community and among the health professionals.
3. Stimulation of generic prescribing and dispensing through incentives.
4. Encouragement of financing of medical treatment including purchase of medicines through employment – based or medical insurance schemes.

Project Team

Survey Managers

- Mr P. Burhoo, Research Officer/Senior Research Officer, Mauritius Institute of Health
- Mr D. Jawaheer, Pharmacist/Senior Pharmacist, Ministry of Health & Quality of Life

Area Supervisors

- Dr P. Munbodh, Community Physician, Ministry of Health and Quality of Life
- Mr S. Ramphul, Senior Pharmacist, Ministry of Health and Quality of Life
- Mr E. Chin Koon Siw, Principal Dispenser, Ministry of Health and Quality of Life
- Mr N. Raffique, Financial Management Analyst, Ministry of Business, Enterprise & Cooperatives.

Data Collectors

- Mr C. Narrainen, Senior Pharmacy Dispenser, Ministry of Health and Quality of Life
- Mr H.K Bucktowar, Senior Pharmacist, Ministry of Health and Quality of Life
- Mr L. Seechurn, Retired Chief Pharmacy Dispenser, Ministry of Health and Quality of Life
- Mr R. Oogarah, Acting Pharmacy Stores Manager, Ministry of Health and Quality of Life
- Mr C.T Parsade, Retired Chief Pharmacy Dispenser, Ministry of Health and Quality of Life
- Mr A.G Monodee, Retired Chief Pharmacy Dispenser, Ministry of Health and Quality of Life
- Mrs H. Suddul, Word Processing Operator, Ministry of Health and Quality of Life
- Mr S.S Pillai, Documentalist, Mauritius Institute of Health
- Mr N. Ramkurrun, Executive Assistant, Mauritius Institute of Health
- Mr M.R Beebeejaun, Nursing Officer/ IT trainer, Mauritius Institute of Health

Data Entry personnel

- Mrs B.F Sookun, Acting Assistant Financial Operations Officer, Mauritius Institute of Health
- Mrs K. Matar, Clerk/Word Processing Operator, Mauritius Institute of Health

Abbreviations

Cap	Capsule
CIF	Cost, insurance and freight
EML	Essential Medicines List
FOB	Free on board
GDP	Gross domestic product
HAI	Health Action International
Inh	Inhaler
Inj	Injection
IRP	International Reference Price
LPG	Lowest priced generic equivalent
M.I.H	Mauritius Institute of Health
MOH&QL	Ministry of Health and Quality of Life
MPR	Median Price Ratio
MSH	Management Sciences for Health
MSP	Manufacturer's Selling Price
MUR	Mauritian Rupees
OB	Originator brand
Susp	Suspension
Tab	Tablet
USD	United States dollars (also \$)
VAT	Value Added Tax
WHO	World Health Organization

List of Tables

- Table 1: Sample of and private medicine outlets
- Table 2: Mean availability of medicines on the day of data collection, public and private sectors
- Table 3: Summary of Availability of individual medicines in the public sector
- Table 4: Summary of medicines in the private sector with low availability i.e. both OB & LPG available in less than 50% of outlets
- Table 5: Public sector procurement - ratio of median unit price to MSH international reference price (median price ratio or MPR), median for all medicines found
- Table 6: Private sector patient prices - ratio of median unit price to MSH international reference price (median price ratio or MPR), median for all medicines found
- Table 7: Comparison of the prices of originator brands and generically equivalent products: Median MPRs for medicines found as both product types
- Table 8: Mean availability per survey area, private sector
- Table 9: Median MPRs per survey area, private sector
- Table 10: Number of days' wages of the lowest paid government worker needed to purchase standard treatments
- Table 11: Components of medicine prices: imported, private sector
- Table 12: Median prices ratios of basket of medicines surveyed in private sector in six countries
- Table 13: Median Price Ratios of selected medicines in private sector in eight countries

List of Figures

- Figure 1: Geographic location of the six health regions surveyed
- Figure 2: Median price ratios for originator brand medicines, private sector
- Figure 3: Median price ratios for selected generic medicines, private sector
- Figure 4: Median price ratios for selected medicines, originator brand and generic equivalents, private sector
- Figure 5: Percent Contribution of price components to final price (MUR 70.55) Albendazole, private sector, imported originator brand
- Figure 6: Ratio of local price to international reference price for lowest priced generic Carbamazepine 200 mg cap/tab in 6 countries.
- Figure 7: Ratio of local price to international reference price for lowest priced generic Diazepam 5 mg cap/tab in 6 countries
- Figure 8: Ratio of local price to international reference price for Atenolol 50 mg cap/tab
- Figure 9: Ratio of local price to international reference price for Omeprazole 20mg cap/tab in 5 countries
- Figure 10: Comparison of availability of baskets of medicines surveyed in 7 countries
- Figure 11: Number of days' wages of the lowest paid government worker needed to purchase Glibenclamide 5 mg tabs in the private sector for the treatment of diabetes
- Figure 12: Price components to final price for an imported originator brand in the private sector

1. Introduction and background

1.1 Introduction

In August 2008, the Mauritius Institute of Health conducted a nationwide study on the prices, availability, affordability and price components of a selection of medicines in the Republic of Mauritius.. The main goals of the study were to document the prices, availability and affordability of medicines and compare them across product types (originator brands and generics), sectors, and other countries; and to categorize price component costs and identify those with the most significant contribution to the final price of medicines.

This study was conducted using the standardized methodology developed by the World Health Organization (WHO) and Health Action International (HAI). The WHO/HAI methodology is described in the manual *Measuring Medicine Prices, Availability, Affordability and Price Components* (WHO/HAI, 2008) and is accessible on the HAI website (<http://www.haiweb.org/medicineprices>).

The main objectives of the study were to answer the following questions:

- Is the public sector purchasing medicines efficiently in comparison with international reference prices?
- What is the availability of originator brand and generic medicines in the public and private sectors?
- What is the price of originator brand and generic medicines in the private sector, and how does this compare with international reference prices?
- What is the difference in price of originator brand products and their generic equivalents?
- How affordable are medicines for the treatment of common conditions for people with low income?
- What different charges get added on to the price of medicines as they proceed from manufacturer to patient?
- How do the prices of medicines in Mauritius compare to those in other countries?

1.2 Country background

The Republic of Mauritius is a small sized country, comprising the main Island of Mauritius and the Island of Rodrigues with a total area of 1969km². The Island of Mauritius lies in latitude 20° South and longitude 57.5 ° East i.e. 900 km off the east coast of Madagascar. The total population is 1.3 million, which comprises Indo-Mauritians, General population (i.e. people of mixed European and African origin) and Sino-Mauritians.

Mauritius is a middle-income country with a GDP of US \$11800 per capita. (2007 est.) Of the total labor force, approximately 10% of persons are unemployed.

Life expectancy at birth is 69.1 years for male and 75.8 for female, with 10% of the population over the age of 60 years (2007 figures). Key contributors to morbidity and mortality are:

1. Diseases of circulatory system
2. Diabetes Mellitus
3. Neoplasm
4. Respiratory system
5. Injury and poisoning

1.3 Health sector

In 2003, the per capita total expenditure on health was US\$172 (average exchange rate). Approximately 4% of the GDP is spent on health. Of the total expenditure on health, 61% is government expenditures, which represents 9% of all government expenditures. The remaining 39% of total expenditures on health is private expenditures, of which 100% are out-of-pocket expenditures. (*Source: World Health Report 2006*)

The public health sector which provides free health services to all, is composed of 3 levels.

At tertiary level there are 5 specialized hospitals: one psychiatric hospital and four others for chest diseases, eye diseases, ear, nose and throat (ENT) diseases and heart diseases.

At the secondary level in the Island of Mauritius there are 5 regional hospitals (one in each of the five health regions) and two district hospitals. The Island of Rodrigues has one general hospital and two community hospitals.

Primary health care is provided in 21 Area Health Centres (AHC), two mediclinics and 112 Community Health Centres (CHC). The basic services delivered at CHC include the treatment of common diseases and injuries, maternal and child care and family planning. In addition to these services AHC also provide dental care.

The private health sector consists of 13 private clinics. 544 doctors are in the private practice.

Only about 6% of the population has health insurance coverage (*Source: World Health Survey Report Mauritius 2003*).

1.4 Pharmaceutical sector

There are approximately 227 licensed private retail medicine outlets in the country. Sectors which dispense a substantial proportion of medicines to patients include both the public sector (with about 8 million patients per year which represent about 70% of all ambulatory care and 85% of all inpatient care visits (*Source: World Health Survey Report Mauritius 2003*) and the private sector. The public health facilities provide free medicines to all patients.

1.4.1 *National Medicines (Drugs) Policy*

In Mauritius, there is no National Medicines Policy (NMP) document.

14.2 *Regulatory system*

In Mauritius, there is a formal medicines regulatory authority which is funded through the regular budget from the government. Legal provisions are in place requiring transparency and accountability and promoting a code of conduct in regulatory work. A medicines regulatory authority provides information on: legislation, regulatory procedures, prescribing information (such as indications, contraindications, side effects, etc.), authorized companies, and/or approved medicines.

No website providing publicly accessible information, as mentioned above, is currently available.

There are no registration fees for medicines in Mauritius.

In Mauritius, there are legal provisions for marketing authorization. A total of 3500 medicinal products have been approved for marketing. A list of all registered products is not publicly accessible.

A quality management system with an officially defined protocol for ensuring the quality of medicines is in place in Mauritius. Medicine samples are tested for post-marketing surveillance, but not for medicines registration. In 2007, in the public sector 19 samples were quality tested, with 2 failing to meet quality standards. Regulatory procedures are in place for ensuring the quality of imported medicines.

Legal provisions are in place for the licensing and practice of prescribers and pharmacy.

There is no obligation to prescribe by generic name in the public or private sector. However as most drugs are purchased through tenders in the public sector, prescribing is currently done using generic name only and the drugs are supplied free of charge in the hospital itself.

Generic substitution is not permitted in public or private pharmacies. There are no incentives to dispense generic medicines at public or private pharmacies.

There are provisions in the medicines legislation/regulations covering promotion and/or advertising of medicines.

1.4.3 Medicines supply system

Public sector procurement is pooled at the national level (i.e. there is centralized procurement for the regions).

Public sector medicines distribution is the responsibility of the Ministry of Health and Quality of life.

The following tender processes are used for public sector procurement:

- National competitive tender - 20% of total cost
- International competitive tender - 100% of total cost

Note: The Ministry of Health and Quality of Life resorts to national competitive tenders to palliate for shortage and in case of delay in supply from overseas.

Public sector procurement is not limited to medicines on the Essential Medicines List (EML). There are no regulations for local preference in public sector procurement.

1.4.4 Medicines financing

In 2007, the total public expenditure for medicines was US\$ 12 million. More than 90% by value are imported.

There is a national policy to provide free health services including free medicines to all patients attending any Government Health institution for treatment including primary care facilities. Hence no fees are charged at primary care facilities.

According to the *World Health Survey Report Mauritius 2003*, medicines constitute 41.8% of the total out-of-pocket health expenditure.

Prescribers in the public sector never dispense medicines, while prescribers in the private sector occasionally dispense medicines (such as vaccines or injectables).

In Mauritius, none of the population has public health insurance. However, some of the population has private health insurance, which may cover some or all medicines depending on the insurance cover.

Mauritius has a policy covering medicine prices that applies to the private sector, but not the public sector. It includes policies concerning maximum wholesale mark-ups/maximum retail mark-ups/duty on pharmaceutical products.

The government sets the price of originator brand and generic products.

The national Essential Medicines List is not being used for setting prices of medicines in the private sector. Setting prices is not part of market authorization.

Mauritius does not have a national medicine price monitoring system for retail/patient prices.

There are no regulations mandating retail medicine price information to be made publicly accessible. However it is mandatory to affix the retail price on each package. There are no official written guidelines on medicine donations that provide rules and regulations for donors and provide guidance to the public, private and/or NGO sectors on accepting and handling donated medicines. WHO guidelines are used in the absence of the official written guidelines.

1.4.5 Rational use of medicines

Mauritius does not have a national Essential Medicines list (EML). However the formulary of the Ministry of Health & Quality of life, which is a Government-approved selective list (for use in public institutions only), is based on the WHO concept of Essential Drugs which comprise of about 700 drugs. This list which is regularly updated satisfies the priority health care needs of the population. They are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparatively cost-effectiveness.

The above list, last updated in 2007, is being used for public sector procurement. There is a committee responsible for the selection of products on this national list.

The health ministry does not generally produce national, hospital or primary care standard treatment guidelines (STG) for major conditions.

Antibiotics are not sold over the counter without a prescription, while injections may be sold over the counter without a prescription. The Pharmacy Act, which is the main legislation governing the practice of pharmacy and dispensing of drugs, prohibits the sale of medication such as psychotropics or antibiotics without a prescription.

2. Methodology

2.1 Overview

The survey of the prices, availability and affordability of medicines in Mauritius was conducted using the standardized WHO/HAI methodology¹ (WHO/HAI 2008). Data on the availability of medicines were collected in medicine outlets in the public sector and availability and final (patient) prices of medicines in the private sector. Government procurement prices were also surveyed.

A total of 50 medicines were surveyed – 25 from the WHO/HAI core list (14 global medicines and 11 regional medicines), and 25 supplementary medicines selected at the country level. For each medicine in the survey, up to two products were monitored, namely:

- Originator brand (IB) - the original patented pharmaceutical product
- Lowest-priced generic equivalent (LPG) - the lowest-priced in the facility at the time of the survey

All prices were converted to US dollars using the exchange rate (buying rate) on 8th August 2008, the first day of data collection, i.e. 1 USD = MUR 26.0100.

A price component survey was also conducted to identify the various components contributing to the final price of medicines. The survey included two parts: a pharmaceutical policy investigation at the central level and research into actual price components along the medicine distribution chain. In the latter, a selection of survey medicines was traced backwards through the supply chain, from dispensing point to importer, and different charges and mark-ups were identified.

2.2 Selection of medicine outlets

Sampling was conducted in a manner consistent with the WHO/HAI methodology, which has been shown through a recent validation study to yield a nationally representative sample¹.

The Republic of Mauritius is divided into six health regions: 5 health regions in the Island of Mauritius and the Island of Rodrigues as the sixth health region (see figure 1). Each health region was taken as a “survey region” or “survey area” for data collection.

¹ The WHO/HAI sampling methodology was validated in 2005 when a medicine prices survey was conducted in Peru. In this survey, a much larger selection of public and private medicine outlets, from a greater number of geographical regions, were included than is required in the standard sample. Results from the expanded sample were consistent with those from the standard sample, showing that the standard sampling frame is nationally representative.

In each survey area, five public sector medicine outlets and five private retail pharmacies were selected, yielding a total of 30 public and 30 private outlets.

The public sector sample included the regional hospital (which is the main public hospital of the health region) and any specialized and/or district/community hospital(s) located in the region. The remaining outlets were selected at random from the list of primary care centres (Area Health Centres and Community Health Centres).

The private medicine outlets were selected from an updated list of registered pharmacies. In the Island of Rodrigues the only private pharmacy was visited and an additional four retail outlets were selected from the two urban health regions in the Island of Mauritius, where as a result seven private outlets were visited. The sampling details are shown in Table 1.

Table 1: Sample of public and private medicine outlets

	Dr A.G. Jeetoo Hospital (Region 1)	SSRN Hospital (Region 2)	Flacq Hospital (Region 3)	J. Nehru Hospital (Region 4)	Victoria Hospital (Region 5)	Rodrigues (Region 6)
Public sector	1 regional hospital	1 regional hospital	1 regional hospital	1 regional hospital	1 regional hospital	1 general hospital
	2 specialised hospital	1 specialised hospital	4 primary care centres	1 district hospital	1 specialised hospital	4 primary care centres
	2 primary care centres	3 primary care centres		3 primary care centres	3 primary care centres	
Private sector	7 pharmacies	5 pharmacies	5 pharmacies	5 pharmacies	7 pharmacies	1 pharmacy



Figure 1: Geographic location of the six health regions surveyed

2.3 Selection of medicines to be surveyed

The WHO/HAI methodology specifies a core list of 14 global medicines and 16 regional medicines to be surveyed, representing medicines commonly used in the treatment of a range of chronic and acute conditions. The methodology also includes the specific dosage form and strength that is to be collected for each medicine. This ensures that data on comparable products are collected in all surveys, thereby allowing international comparisons to be made.

In Mauritius, all the 14 global core medicines, and 11 of the 16 regional medicines, from the WHO/HAI core list were included in the survey. The following five medicines were excluded:

- Amodiaquine tab/ Cap
- Artemether-lumefantrine tab/Cap
- Benzathine benzyl penicillin Injection
- Sulphadoxine-pyrimethamine tab/ Cap
- Tetracycline eye ointment

These medicines were excluded from the survey because of their very limited use in the country.

An additional 25 supplementary medicines were selected at the country level for inclusion in the survey. Supplementary medicines were selected based on their usefulness in the treatment of illnesses of national importance. The full list of survey medicines is provided in Annex 1.

2.4 Data Collection

The survey team consisted of two survey managers, four area supervisors, ten data collectors and two data entry personnel. The survey managers and the supervisors received training in the standard survey methodology and data collection/data entry procedures at a regional workshop held in Mauritius between 25 and 29 February 2008. The data collectors who were either dispensers or officers having survey experience were given a 3-day training prior to data collection. As part of the workshop, a data collection pilot test was conducted at public and private medicine outlets, which did not form part of the survey sample.

Data collection took place between 8th and 23rd August. Data collectors visited medicine outlets in pairs and collected information on medicine availability and price using a standard data collection form specific to the medicines being surveyed in Mauritius (Annex 2). Area supervisors checked all forms at the end of each day of data collection, and validated the data collection process by collecting data at 20% of the medicine outlets and comparing their results with those of the data collectors. Upon completion of the

survey the survey manager conducted a quality control check of all data collection forms prior to data entry.

In the island of Rodrigues the data collectors did not find at least 50% of the targeted medicines in one of the selected public medicine outlets. An additional public outlet where availability exceeded 50% was hence surveyed.

Public procurement data were collected on the prices that the government pays to procure medicines. Data were collected for the same global, regional and supplementary medicines as surveyed in medicine outlets. Procurement data were obtained from the Procurement Unit of the Ministry of Health and Quality of Life which is responsible for the procurement of medicines.

To collect data on price components, seven "tracer" medicines were selected from the list of survey medicines. The price of these medicines was tracked backwards, from sample medicine outlets to central sources, to identify the different charges added to the price of the medicine at each stage of the distribution chain. This was accomplished by contacting the relevant sources namely the importers, wholesalers, retailers and the Price Fixing Unit of the Ministry of Consumer Protection and Citizens Charter.

2.5 Data Entry

Survey data were entered into the pre-programmed MS Excel *Workbook* provided as part of the WHO/HAI methodology. Data entry was checked using the 'double entry' and 'data checker' functions of the *Workbook*. Erroneous entries and potential outliers were verified and corrected as necessary.

2.6 Data Analysis

The availability of individual medicines is calculated as the percentage (%) of medicine outlets where the medicine was found. Mean (average) availability is also reported for the overall 'basket' of medicines surveyed. The availability data only refers to the day of data collection at each particular facility and may not reflect average monthly or yearly availability of medicines at individual facilities. The availability of individual medicines in the public sector was limited to those facilities where the medicine was expected to be available. For example, if a survey medicine is only provided through secondary or tertiary hospitals, the calculation of the medicine's % availability was limited to these facilities.

To facilitate cross-country comparisons, medicine prices obtained during the survey are expressed as ratios relative to a standard set of international reference prices:

$$\text{Medicine Price Ratio (MPR)} = \frac{\text{median local unit price}}{\text{international reference unit price}}$$

The ratio is thus an expression of how much greater or less the local medicine price is than the international reference price e.g. an MPR of 2 would mean that the local medicine price is twice that of the international reference price. Median price ratios were only calculated for medicines with price data from at least 4 medicine outlets, except for procurement prices where a single data point was accepted. The exchange rate used to calculate MPRs was 1 US\$ = MUR26.0100; this was the commercial “buying” rate on the first day of data collection (i.e. 8th August 2008) taken from the Daily Exchange Rates of the Mauritius Commercial Bank (<http://www.mcb.mu/ABOUTMCB/forex/INDEX.asp>) The reference prices used were the 2006 Management Sciences for Health (MSH) reference prices, taken from the International Drug Price Indicator Guide. These reference prices are the medians of recent procurement prices offered by for-profit and not-for-profit suppliers to international not-for-profit agencies for generic products. These agencies typically sell in bulk quantity to governments or large NGOs, and are therefore relatively low and represent efficient bulk procurement without the costs of shipping or insurance.

Price results are presented for individual medicines, as well as for the overall 'basket' of medicines surveyed. Summary results for the basket of medicines have been shown to provide a reasonable representation of medicines in the country and price conditions on the market. As averages can be skewed by outlying values, median values have been used in the price analysis as a better representation of the midpoint value. The magnitude of price and availability variations is presented as the interquartile range. A quartile is a percentile rank that divides a distribution into 4 equal parts. The range of values containing the central half of the observations, that is, the range between the 25th and 75th percentiles, is the interquartile range.

Finally, the affordability of treating 14 common conditions was assessed by comparing the total cost of medicines prescribed at a standard dose, to the daily wage of the lowest paid unskilled government worker, which at the time of survey was Rs215 or US \$ 8.23. (*Source: Pay Research Bureau Report Review of Pay and Grading Structures and Conditions of Service in the Public Sector May 2008*). Though it is difficult to assess true affordability, treatments costing one days' wage or less (for a full course of treatment for an acute condition, or a 30-day supply of medicine for chronic diseases) are generally considered affordable.

2.7 Price components survey

The price paid for a medicine comprises a number of price components, the manufacturer's selling price (MSP) being one of them. As medicines move along the supply chain, from the manufacturer to the patient, additional costs are added to the MSP. These price components come from a variety of sources such as freight costs, insurance, local charges, wholesale mark up and retail mark up.

Prior to data collection on the components of medicine prices, interviews were conducted at the central level with staff in various ministries and health-care delivery systems to collect information on government policies and regulations that affect price components.

In the second phase, data were collected on the actual price components of selected medicines. Target medicines were tracked backwards, from the end of the supply chain (retail pharmacies in the private sector) to the beginning (manufacturers and importers), to identify add-on costs.

The terminology used with respect to price components is explained below:

- **FOB**
This consists of the MSP and it excludes any freight and insurance charges.
- **CIF**
The sum of the cost of imported price of pharmaceutical products, the freight charges to transport the medicines from manufacturer's factory to the imported country and the insurance charges to insure the products is known as the cost, insurance and freight (CIF).
- **LANDED COST**
The landed cost include the CIF, inspect charges, port fees such as storage, handling and insurance in port, custom clearing charges and local transport charges to the warehouse.
- **MARGIN**
The margin is a certain percentage added to the landed cost to cover the operating expenses and an element of profit of the wholesalers and retailers.
- **WHOLESALE MARGIN**
The wholesale margin is a percentage added to the landed cost to cover the operating expenses of the wholesalers and an element of profit for the wholesalers. The sum of the landed cost and the wholesale margin is termed as the wholesale price.
- **RETAIL MARGIN**
The retail margin is a percentage added to the wholesale price to cover the operating expenses of the retailers and it also includes an element of profit for the retail outlets.

Seven medicines which were tracked through the supply chain are:

- Albendazole 400mg cap/tab
- Atenolol 50mg cap/tab
- Carbamazepine 200mg cap/tab (only OB)*
- Glibenclamide 5mg cap/tab
- Metronidazole 20/250mg cap/tab
- Omeprazole 20mg cap/tab (only OB)*
- Salbutamol inhaler 0.1mg/dose

* *Data on the two LPGs could not be made available by the wholesaler.*

Medicines were selected from the global and regional medicines included in the medicine prices survey to reflect a range of categories (e.g. single- and multi-source imported products, various formulations, adult and pediatric treatment etc) in which different price structures could be found. For each medicine, data were collected for both the originator brand product and a generic equivalent. The generic product was the lowest-priced generic most commonly found during the medicine prices and availability survey. Data were collected for the private sector and in one area as mark-ups and other add-ons do not vary according to whether urban or rural region.

Beginning at the dispensing point, target medicines were tracked backwards along the supply chain to their point of origin. For example, at the private retail pharmacies, information was collected on the dispensing price, as well as any mark-ups, taxes and dispensing fees, and the wholesaler was identified for each medicine. Next identified wholesalers were visited, and data were collected on wholesale mark-ups, local distribution costs and any taxes collected. Data collection proceeded in this manner through each stage of the supply chain, ending with the importer.

The data collected on the components of medicine prices were analysed according to four common stages of the supply chain:

- manufacturer's selling price + insurance and freight (Stage 1);
- landed price (Stage 2);
- wholesale selling price (private) (Stage 3); and
- retail price (private) (Stage 4)

Analysis includes the cumulative percent mark-up at the end of each stage, the total cumulative percent mark-up, and the percent contribution of individual components to the final medicine price.

3. Results

3.1 Availability of medicines on the day of data collection

Table 2 gives the mean availability of the basket of medicines surveyed in both the public and private outlets on the day of data collection.

Table 2: Mean availability of medicines on the day of data collection, public and private sectors

	Public sector (n = 30 outlets)				Private sector (n = 30 outlets)	
	All medicines (n = 50 medicines)		EML medicines only (n = 45 medicines)		All medicines (n = 50 medicines)	
	Originator brand	Lowest price generic	Originator brand	Lowest price generic	Originator brand	Lowest price generic
Mean availability (standard deviation)	0%	68.6 (37.4)	0%	71.2 (36.6)	55.7 (41.9)	54.9 (34.4)

- Average availability of all survey medicines in the public sector was good at 68.6% *. (see *Explanatory Note on Availability Data at Annex 3*). When analysis is limited to survey medicines listed on the national EML, public sector availability increases to 71.2%.
- In the public sector, generics were the only product type available.
- Average availability of the lowest priced generic equivalent in the private sector was good at 54.9%. In the private sector, both originator brands and lowest priced generics were found with similar prevalence.
- In the private sector, availability of the surveyed medicines was lower than that of the public sector.
- The standard deviations show a large variation in availability between facilities and outlets – a number a much better than the average, some much worse.

Annex 4 contains the availability of individual medicines in both public and private sectors. Table 3 below summarizes the availability of individual medicines in the public sector; 4 out of 50 medicines surveyed were not found in any outlet and 11 others were available in less than 50% of outlets visited.

Table 3: Summary of Availability of individual medicines in the public sector

Medicines not found in any outlets	Captopril, Cephalexin, Famotidine, Simvastatin
Medicines found in less than 25% of outlets	Amoxicillin, Atenolol, , Chloroquine, Fluconazole, Glibenclamide, Isosorbide mononitrate, Nystatin
Medicines found in 25 to 50% of outlets	Aciclovir, Albendazole, Ethinylestradiol+levonorgestrel,
Medicines found in 50 to 75% of outlets	Alprazolam, Bisacodyl, Ceftriaxone injection Fluoxetine, , Levothyroxine, Tamoxifen
Medicines found in over 75% of outlets	Acetyl salicylic acid, Amitriptyline, Amlodipine, Amoxicillin suspension, Atorvastatin, Beclomethasone, Betamethasone valerate crème, Carbamazepine, Chloramphenicol oph. drops, Chlorpheniramine, Ciprofloxacin, Co-trimoxazole, Co-trimoxazole suspension, Diazepam, Diclofenac, Enalapril, Erythromycin, Ferrous salt/Folic acid, Fusidic acid, Hydrochlorothiazide, Insulin, Levodopa, Loperamide, Metformin, Metronidazole, Omeprazole, ORS, Paracetamol tab & suspension, Salbutamol.

Table 4 gives the list of medicines with low availability in the private sector.

Table 4: Summary of medicines in the private sector with low availability i.e. both OB & LPG available in less than 50% of outlets

Medicines with low availability	OB	LPG
Cephalexin	0%	3.30%
Chloramphenicol Opht. Drugs	0%	20%
Chloroquine	3.3%,	0%
Erythromycin	0%	36.70%
Ferrous salt/Folic acid	n/a	26.70%
Simvastatin	13.30%	23.30%
Tamoxifen	26.70	0%

***Explanatory Note on Availability Data at Annex 3**

3.2 Public sector procurement prices

Of the 50 medicines included in the survey, 42 generics were found in the public procurement sector; the public sector is therefore procuring exclusively generic products. Based on the median MPRs, the public sector is procuring generics at 34% less than the international reference prices and 75% of medicines are being procured at less than 0.99 times the international reference prices (see Table 5). Thus, the government procurement agency is purchasing very efficiently. Also, the interquartile range shows little variation in median price ratios across individual medicines.

Table 5: Public sector procurement - ratio of median unit price to MSH international reference price 2006 (median price ratio or MPR), median for all medicines found

Product type	Median MPR	25 th percentile	75 th percentile
Originator brand (n = 0 medicines)			
Lowest price generic (n = 42 medicines)	0.66	0.46	0.99

Annex 5 contains procurement prices for individual medicines: 32 generic medicines being purchased at prices less than international prices and the remaining at prices slightly more than the international prices.

3.3 Private sector patient prices

Table 6: Private sector patient prices - ratio of median unit price to MSH international reference price 2006 (median price ratio or MPR), median for all medicines found

Product type	Median MPR	25 %ile	75 %ile
Originator brand (n = 32 medicines)	19.28	7.81	37.46
Lowest price generic (n = 41 medicines)	5.93	3.12	10.16

The results in Table 6 show that in the private sector:

- Originator brand medicines are generally sold at 19.28 times their international reference price. Half of the originator brand medicines were priced at 7.81 (25th percentile) to 37.46 (75th percentile) times their international reference price; there is therefore substantial variation in MPRs across individual originator brand medicines in the private sector.
- Lowest price generic medicines are generally sold at 5.93 times their international reference price. Half of the lowest priced generic medicines were priced at 3.12 (25th percentile) to 10.16 (75th percentile) times their international reference price; there is therefore wide variation in MPRs across individual generic medicines in the private sector.

Figure 2 displays some originator brand medicines which are priced several times higher than their international reference prices.

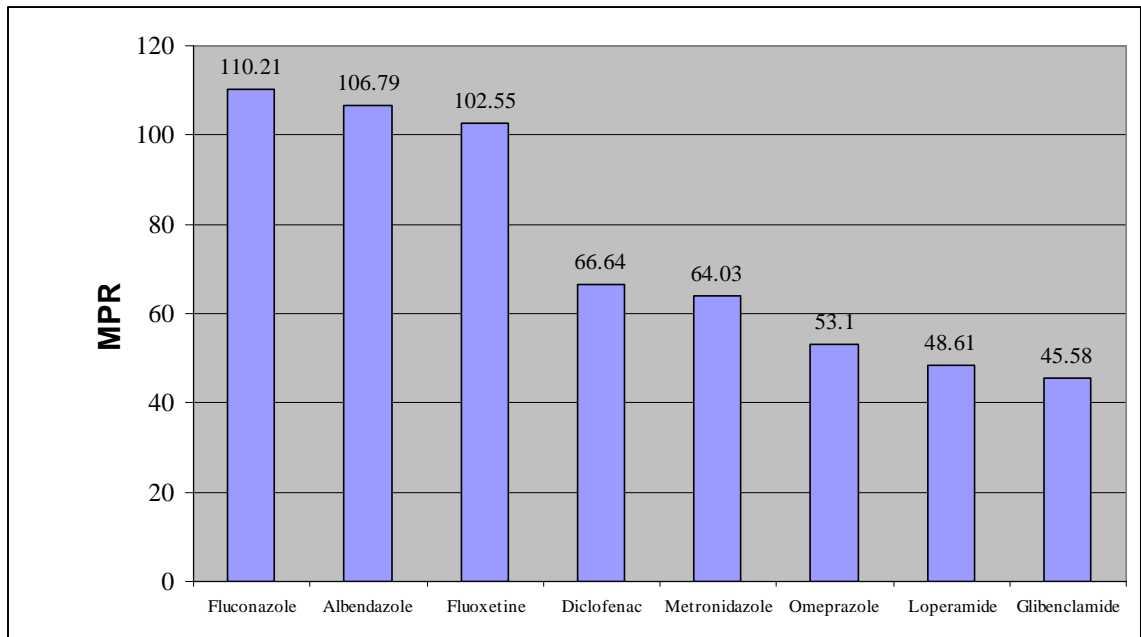


Figure 2: Median price ratios for originator brand medicines, private sector

The 25th and 75th percentiles for individual medicines show that, for originator brands, prices do not vary significantly between private sector medicine outlets.

Lowest price generic medicines which are priced several times higher than their international reference prices are shown in figure 3.

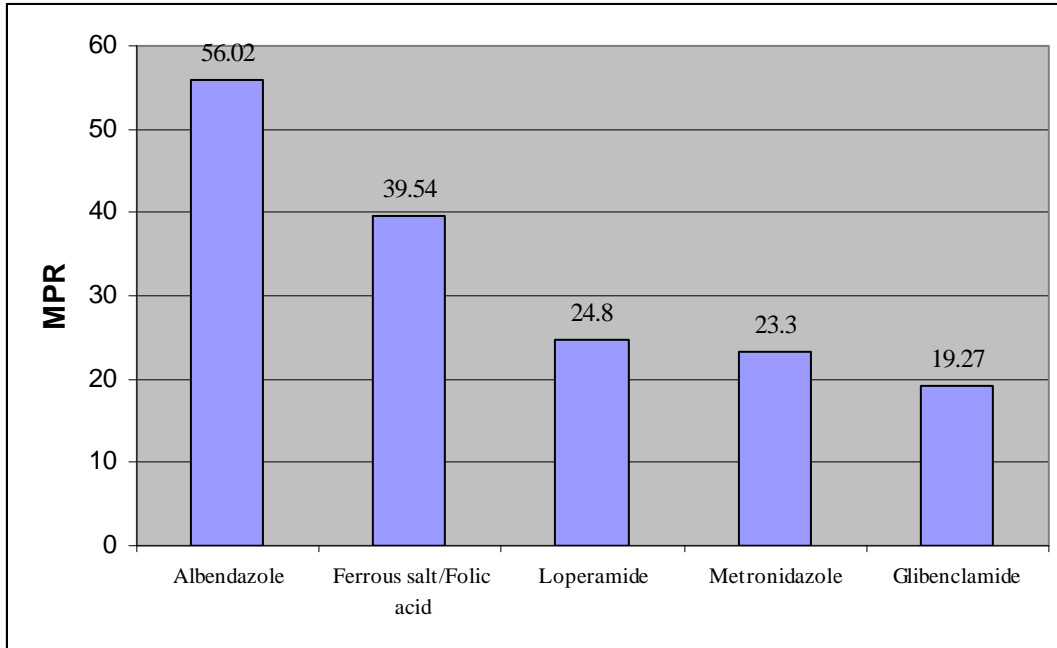


Figure 3: Median price ratios for selected generic medicines, private sector

The 25th and 75th percentiles for individual medicines show that, for a significant number of generic medicines, prices vary significantly between private sector medicine outlets.

Annex 6 contains the median price ratios for individual medicines found in the private sector.

Table 7: Comparison of the prices of originator brands and generically equivalent products: Median MPRs for medicines found as both product types

Type (n = 25 medicines)	Median MPR
Originator brand	19.24
Lowest price generic	5.93

In Table 7, only those medicines, for which both the originator brand and a generically equivalent product were found, were included in the analysis to allow for the comparison of prices between the two product types. Results show that in the private sector, originator brands cost 324 % more, on average, than their generic equivalents. Thus, patients are paying substantially more to purchase originator brand medicines when lower-cost generics are available. Figure 4 depicts some large differences observed between originator brands and generics. Brand premium is particularly high for fluoxetine, diclofenac, omeprazole, atenolol and captopril.

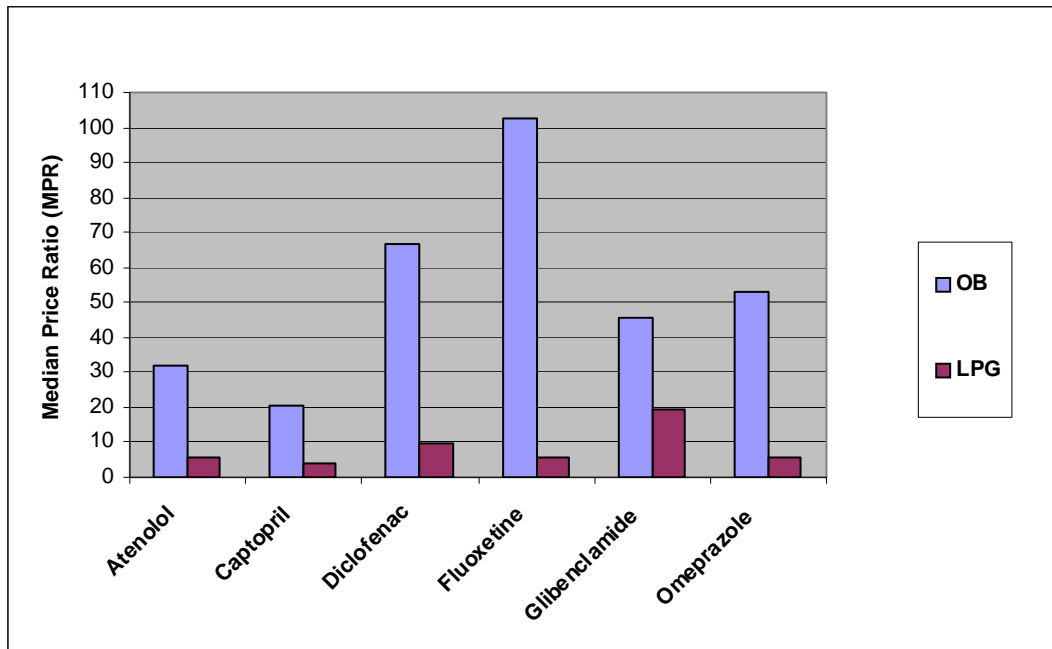


Figure 4: Median price ratios for selected medicines, originator brand and generic equivalents, private sector

3.4 Regional analysis

3.4.1 Comparison of availability of medicines in the public sector across the six regions surveyed

In the public sector no notable variation in mean availability is observed across regions. It is to be pointed out that in Rodrigues the mean availability was 69.5% for all medicines and 70.5% for medicines listed on EML. The corresponding figures for the Island of Mauritius were 68.6% and 71.2% respectively.

3.4.2 *Comparison of availability of medicines in the private sector across the six regions surveyed*

As shown in Table 8 the mean availability of survey medicines in the private sector ranged between 50.9% and 61.6% for the survey regions in the Island of Mauritius. In Rodrigues, the mean availability was very low for both originator brands and generics (around 20%).

Table 8: Mean availability per survey area, private sector

	Mean availability					
	A.G Jeetoo Hosp Area 1 (7 outlets)	SSRN Hosp Area 2 (5 outlets)	Flacq Hosp Area 3 (5 outlets)	J. Nehru Hosp Area 4 (5 outlets)	Victoria Hosp Area 5 (7 outlets)	Rodrigues Area 6 (1 outlet)
Originator brand	58.7%	58.3%	56.5%	55.7%	55.6%	19.6%
Lowest price generic	50.9%	56.4%	60.0%	61.6%	54.6%	20.0%

3.4.3 *Comparison of prices in the private sector across the six regions surveyed*

Table 9 indicates that the median MPR for survey medicines in the private sector differed little across the regions surveyed. (MPR for Rodrigues could not be obtained because only one outlet was visited)

Overall, medicine prices were lowest in A.G Jeetoo Hospital Area. Median MPR for OB was 14.38 and that for LPG was 4.72 for that region. The highest Median MPR for OB i.e. MPR=20.54 was obtained for Flacq Hospital Area and MPR for LPG was highest in Victoria Hospital Area. However, due to the small sample size in each region (5 to 7 medicine outlets per sector, based on availability of the medicine in at least 4 of these), results should be interpreted with caution.

Table 9: Median MPRs per survey area, private sector

	Median MPR				
	Dr. A.G Jeetoo Area 1 (7 outlets)	S.S.R.N Hospital Area 2 (5 outlets)	Flacq Hospital Area 3 (5 outlets)	J. Nehru Hospital Area 4 (5 outlets)	Victoria Hospital Area 5 (7 outlets)
Originator brand	14.38	16.85	20.54	19.93	18.06
Lowest price generic	4.72	5.44	4.86	5.71	6.28

3.5 Affordability of standard treatment regimens

The affordability of treatment for 14 common conditions was estimated as the number of days' wages of the lowest-paid unskilled government worker needed to purchase medicines prescribed at a standard dose. For acute conditions, treatment duration was defined as a full course of therapy, while for chronic diseases, the affordability of a 30-days' supply of medicines was determined. The daily wage of the lowest-paid unskilled government worker used in the analysis was MUR215 (based on a monthly salary of MUR6425).

Table 10: Number of days' wages of the lowest paid government worker needed to purchase standard treatments

Disease condition and 'standard' treatment			Day's wages to pay for treatment		
Condition	Drug name, strength, dosage form	Treatment schedule	Lowest price generic - public sector	Lowest price generic - private sector	Originator brand - private sector
Asthma	Salbutamol 100 mcg/dose inhaler	1 inhaler of 200 doses	Free	0.4	0.4
Diabetes	Glibenclamide 5 mg cap/tab	1 cap/tab x 2 x 30 days = 60	Free	0.5	1.3
Hypertension	Atenolol 50 mg cap/tab	1 cap/tab x 30 days = 30	Free	0.3	1.9
Hypertension	Captopril 25 mg cap/tab	1 cap/tab x 2 x 30 days = 60	Free	0.5	2.8
Hypercholesterolaemia	Simvastatin 20 mg cap/tab	1 cap/tab x 30 days = 30	Free	1.0	1.9
Depression	Amitriptyline 25 mg cap/tab	1 cap/tab x 3 for 30 days = 90	Free	1.0	
Adult respiratory infection	Ciprofloxacin 500 mg cap/tab	1 cap/tab x 2 for 7 days = 14	Free	0.6	
Paediatric respiratory infection	Co-trimoxazole 8+40 mg/ml suspension	5ml twice a day for 7 days = 70 ml	Free	0.3	0.4
Adult respiratory infection	Amoxicillin 500mg cap/tab	1 cap/tab x 3 for 7 days = 21	Free	0.8	1.7
Adult respiratory infection	Ceftriaxone 1 g/vial injection	1 vial	Free	1.4	2.1
Anxiety	Diazepam 5mg cap/tab	1 cap/tab x 7 days = 7	Free		0.2
Arthritis	Diclofenac 50mg cap/tab	1 cap/tab x 2 x 30 days = 60	Free	0.3	2.2
Pain/inflammation	Paracetamol 24mg/ml suspension	child 1 year: 120mg (=5ml) x 3 for 3 days = 45ml	Free	0.1	0.2
Ulcer	Omeprazole 20mg cap/tab	1 cap/tab x 30 days = 30	Free	0.9	8.2

In the public sector all medicines are dispensed free to patients. However, many patients purchase medicines from the private sector.

As Table 10 shows, in the private sector the affordability of lowest price generics was good for all conditions, with standard treatment costing a days' wage or slightly less. No treatments cost more than 2 days' wage of the lowest paid government worker.

When originator brand medicines are prescribed and dispensed in the private sector, several treatments cost well over one days' wage. For example, treating Ulcer requires 8.2 days wages (Omeprazole 20mg cap/tab), treating Hypertension with Captopril 25 mg cap/tab needs 2.8 days wages, treatment of Arthritis with Diclofenac 50mg cap/tab costs 2.2 days wages and treating a respiratory infection in an adult with Ceftriaxone 1 g/vial injection (1 vial) needs 2.1days wages.

It should be noted that treatment costs refer to medicines only and do not include the additional costs of consultation and diagnostic tests. Further, many people in Mauritius earn less than the lowest government wage; as such even treatments which appear affordable are too costly for the poorest segments of the population.

It is also worth mentioning that affordability is based on median prices. So if there is a wide variation (as is the case in Mauritius) the situation may be better from some pharmacies and much worse in others especially if generics are not offered (prescribed and dispensed).

3.6 Price components

Price components have both a direct and cumulative impact on the price of the medicine. Since price components are cumulative (i.e. each element of cost is applied to the running total), each price component rises from the MSP on which all subsequent charges are levied.

3.6.1 Government policies and regulations that affect price components

The prices of pharmaceutical products are subject to price control in Mauritius under the Maximum Mark-Up Regulations made under Consumer Protection (Price and Supplies Control) Act 1998.

The maximum mark-up applicable to pharmaceutical products is presently 35% on landed cost. This mark-up includes wholesale margin of 11% and retail margin of 24% both on landed cost price or the retail margin is 21.6% on wholesale price.

There is also a special allowance of 2% on CIF given to importers to meet clearance charges, marine charges, processing fee and transport.

The prices of pharmaceutical products are not subject to any form of taxes (i.e. import duty and VAT). The main purpose of not imposing taxes on pharmaceutical products is to maintain a price, which is affordable to the consumers.

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

- Manufacturer's selling price
- Insurance and freight
- Special allowance to cater for local charges
- Wholesale mark-up
- Retail mark-up

The present price fixing of pharmaceutical product is done by the Price Fixing Unit, which falls under the Ministry of Consumer Protection and Citizens Charter.

Stage 1: Manufacturer's Selling Price + Insurance and Freight

The stage 1 for Mauritius is made up of two prices namely the FOB price and the insurance and freight in foreign currencies and converted into local currencies, i.e. MUR by using the applicable customs exchange rate. The sum of the fob price and the insurance and freight is known as the cost, insurance and freight (CIF) price.

Stage 2: Landed Price

The landed price is made up of the CIF price in rupees and a special allowance of 2% on the CIF price. The special allowance caters for clearance charges, marine charges, processing fee and transport.

Stage 3: Wholesale Selling Price

The wholesale selling price is the sum of stage 2 costs, i.e. landed price plus the wholesale mark-up of 11% calculated on the landed price.

Stage 4: Retail Price

The retail price is the sum of the wholesale selling price plus the retail margin. The retail margin is a fixed percentage of either 21.6% on wholesale selling price or 24% on landed price.

3.6.2 Price components data collected for individual medicines

Price components data were collected for 7 medicines in the survey by tracking medicine prices backwards through the distribution chain. Results for 3 selected medicines are presented in Table 11, which include individual add-on costs as well as cumulative mark-up.

Table 11: Components of medicine prices: imported, private sector

Stages	Details	Glibenclamide 5 mg tab		Metronidazole 250 mg tab		Salbutamol inhaler 100 mcg	
		Originator	Generic	Originator	Generic	Originator	Generic
Stage 1: MSP	FOB	309.96	166.04	95.79	168.52	52.45	50.91
	Insurance & Freight	14.87	8.99	2.58	9.13	9.99	0.90
CIF		324.83	175.03	98.37	177.65	62.44	51.81
Stage 2: Landed Price	Special Allowance (2%)	6.50	3.50	1.97	3.55	1.25	1.04
Landed Price		331.33	178.53	100.34	181.20	63.69	52.85
Stage 3: Wholesale Price	Wholesale Mark up (11%)	36.45	19.64	11.04	19.93	7.01	5.81
Wholesale Price		367.77	198.17	111.37	201.14	70.69	58.66
Stage 4: Retail Price	Retail Mark up (21.6%)	79.44	42.80	24.06	43.45	15.27	12.67
Final Retail Price		447.21	240.97	135.43	244.58	85.96	71.33
	Add-on costs	44.28%	45.13%	41.38%	45.13%	63.90%	40.11%

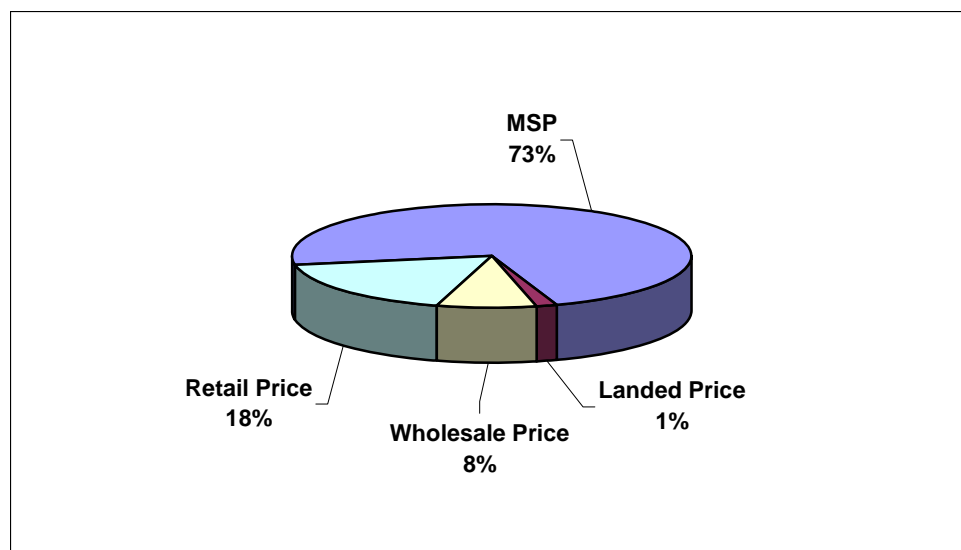


Figure 5: Percent Contribution of price components to final price (MUR 70.55) *Albendazole, private sector, imported originator brand*

In the private sector, add-on costs represent between 40.11% and 63.90% of the final patient price for imported medicines. Mark-ups for originator brands and generics are the same. The largest contributor to add-on costs is retailer mark-up. MSP represents the major element of the retail price. (See figure 5).

3.7 International comparisons

In every WHO/HAI survey, data are collected on the same core medicines with the same dosage forms and strengths, which allows for comparisons to be made across countries. A number of countries namely Kenya, Nigeria, Ghana, Fiji, Pakistan, India (State of Maharashtra), Indonesia, Jordan, Malaysia, Morocco and Yemen were selected for international comparisons of the availability, medicines price ratios and affordability found in this survey. Country data were obtained from the global database of survey results available on the HAI website (<http://www.haiweb.org/medicineprices/>). No adjustments are made for varying MSH prices over the years of the surveys and inflation/deflation factor; which adjustments would have given more valid comparisons.

3.7.1 *International comparisons of public sector procurement prices*

Results for individual medicines show that government procurement prices in Mauritius are lower than those in countries like Nigeria, Ghana or Fiji but higher than in Kenya (see figures 6 & 7). Overall, the public sector in Mauritius appears to be purchasing medicines more efficiently than other countries.

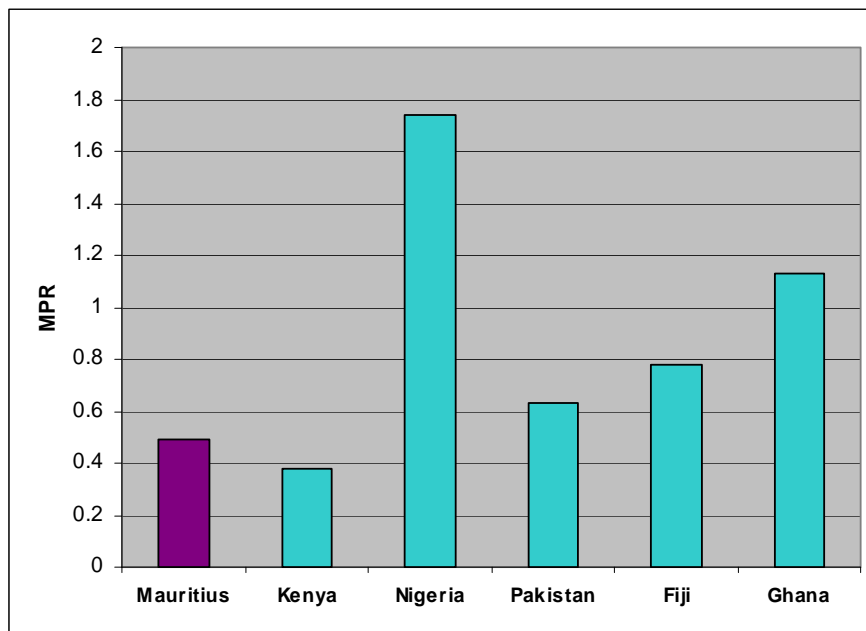


Figure 6: Ratio of local price to international reference price for lowest priced generic Carbamazepine 200mg cap/tab in 6 countries

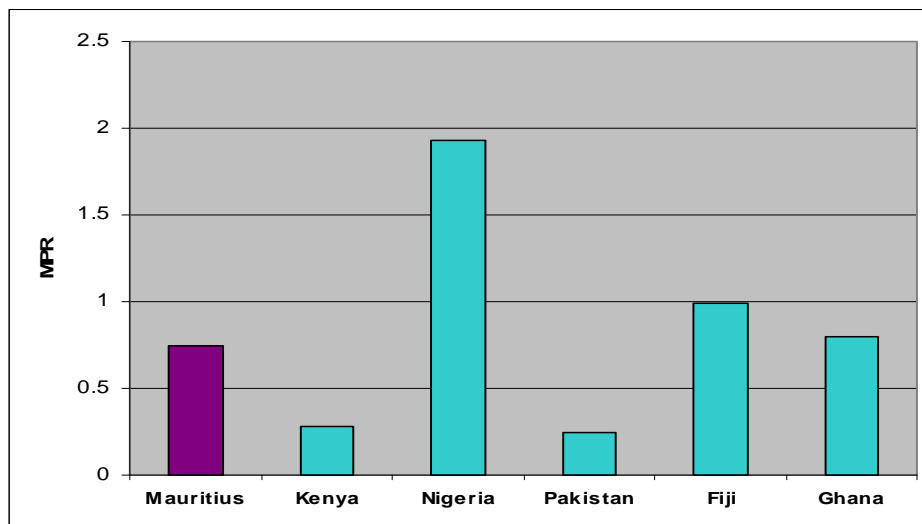


Figure 7: Ratio of local price to international reference price for lowest priced generic Diazepam 5 mg cap/tab in 6 countries

3.7.2 International comparisons of private sector prices

Table 12 compares the median price ratios of basket of medicines surveyed in the private sector for Mauritius with those in five other countries. Overall the MPR medicine prices in Mauritius are high for both innovator brand and lowest prices generics.

Table 13: Median price ratios of basket of medicines surveyed in the private sector in six countries

Type	Mauritius (2007)	Kenya (2004)	Indonesia (2004)	Pakistan (2004)	Fiji (2004)	Ghana (2004)
OB	19.28	17.75	22.78	3.36	9.21	18.47
LPG	5.93	3.33	2.78	2.26	2.73	4.12

Results for individual medicines (table 13 and figures 8 & 9) show that medicine prices in Mauritius for both originator and generic brands are higher than those in India and Pakistan. The prices for a number of medicines are higher than those in Morocco, Yemen and Malaysia as well. Overall, Mauritius medicine prices in the private sector rank fair compared to the other countries in the comparison.

Table 14: Median Price Ratios of selected medicines in private sector in eight countries

Medicine	Type	Mauritius (2007)	Pakistan (2004)	India (2004)	Indonesia (2004)	Jordan (2004)	Malaysia (2004)	Morocco (2004)	Yemen (2006)
Atenolol	OB	31.76	10.79	5.45	75.07	45.75	33.98		28.76
	LPG	5.69	4.06	4.58	20.44	18.39	9.57		5.75
Captopril	OB	20.67	4.16		22.78	12.38	14.54	16.51	13.91
	LPG	3.99	2.76	2.93	1.71	8.24	7.44	13.12	3.48
Ceftriaxone	OB	19.24	3.07		13.02	10.69		11.4	8.49
	LPG	13.05	0.97	0.64	1.49	6.81		7.13	2.76
Ciprofloxacin	OB		26.2	4.53	90.08	100.32	111.63	130.36	129.4
	LPG	10.55	7.02	2.67	7.78	22.06	16.46	82.76	5.33
Cotrimoxazole	OB	12.51	1.84	1.21	43.81	15.06		8.65	8.89
	LPG	10.16	1.15	1.23	2.27	4.66		5.77	2.28
Fluoxetine	OB	102.55	21.8		54.1	51.61	62.99	58.56	
	LPG	5.93	4.48	2.17	18.98	20.56		23.48	
Omeprazole	OB	53.1	4.14		9.48	14.27	10.56	12.78	21.3
	LPG	5.74	0.84	0.48	1.73	5.56	2.54	2.82	1.7
Salbutamol	OB	1.84	0.72	0.87	4.99	2.6	2.7	3.27	2.64
	LPG	1.52	0.72	0.88		1.1	1.48	2.92	1.05

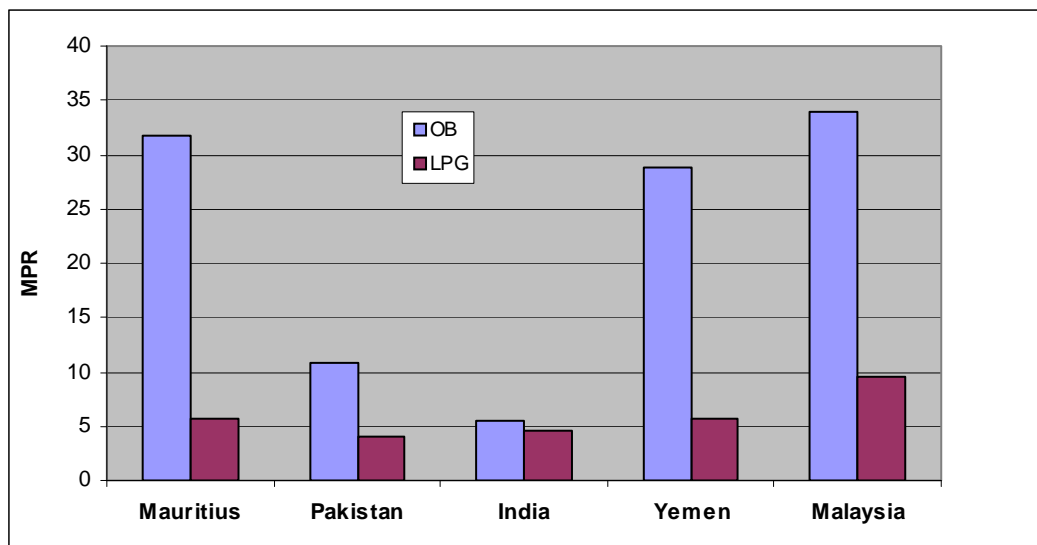


Figure 8: Ratio of local price to international reference price for Atenolol 50 mg cap/tab in 5 countries

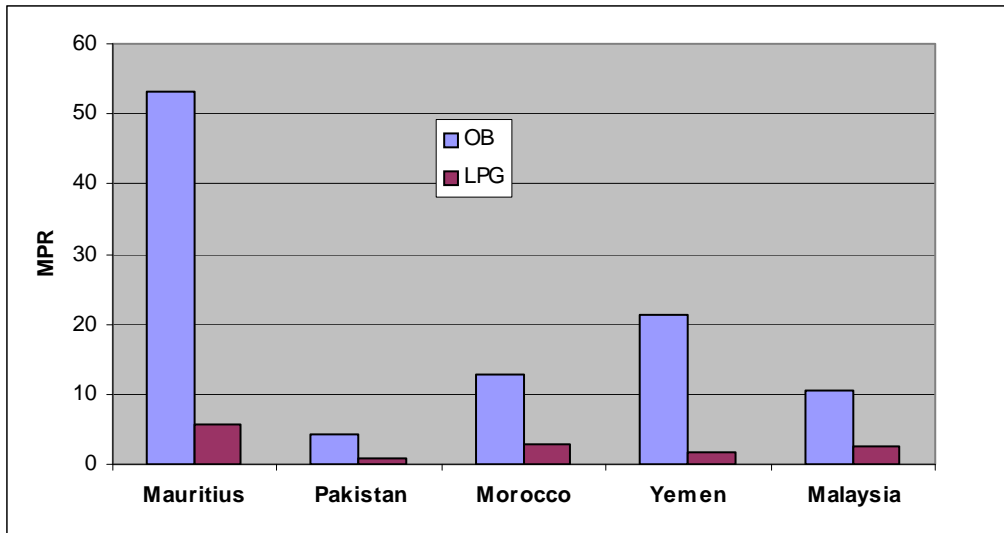


Figure 9: Ratio of local price to international reference price for Omeprazole 20mg cap/tab in 5 countries

3.7.3 International comparisons of private sector availability

Figure 10 which compares mean availability of the basket of medicines surveyed in Mauritius with those in 6 other countries shows that availability of generic medicines in the public sector in Mauritius is higher than all the other countries. In the private pharmacies the mean availability for generic products is more or less similar to countries like Morocco, Pakistan and Indonesia but lower than Jordan and Yemen. With respect to originator brands, availability in Mauritius is similar to those in Pakistan, Yemen and Jordan, lower than those in Morocco, and higher than those in Malaysia and Indonesia.

Overall, the availability of medicines in Mauritius (both private and public sectors) ranks well compared to the other countries in the comparison. It is worth pointing out that the baskets of medicines surveyed across the different countries may not contain the same medicines.

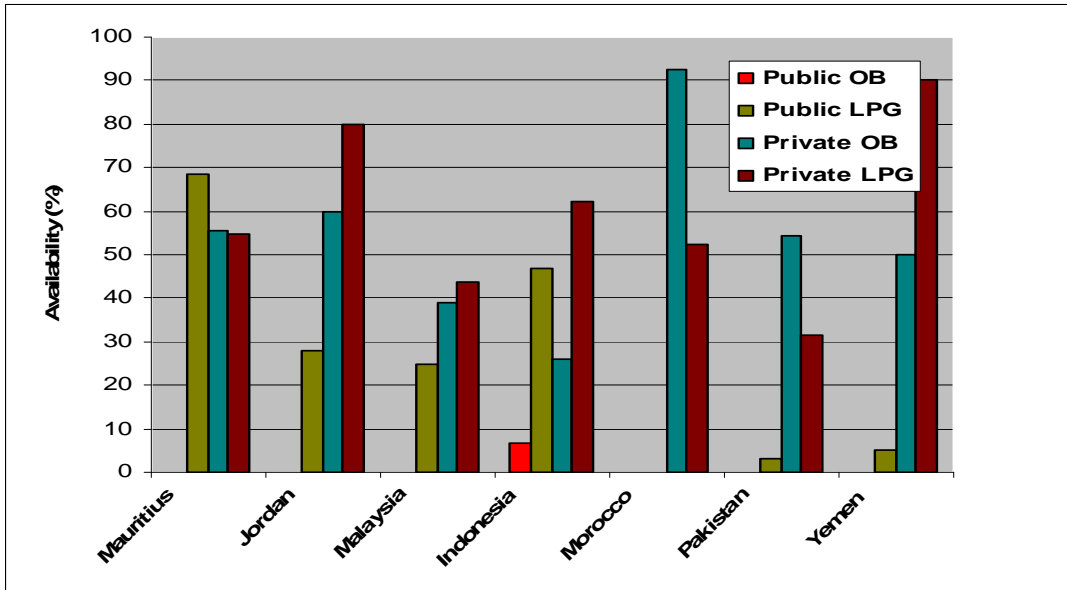


Figure 10: Comparison of availability of baskets of medicines surveyed in 7 countries

3.7.4 International comparisons of private sector affordability

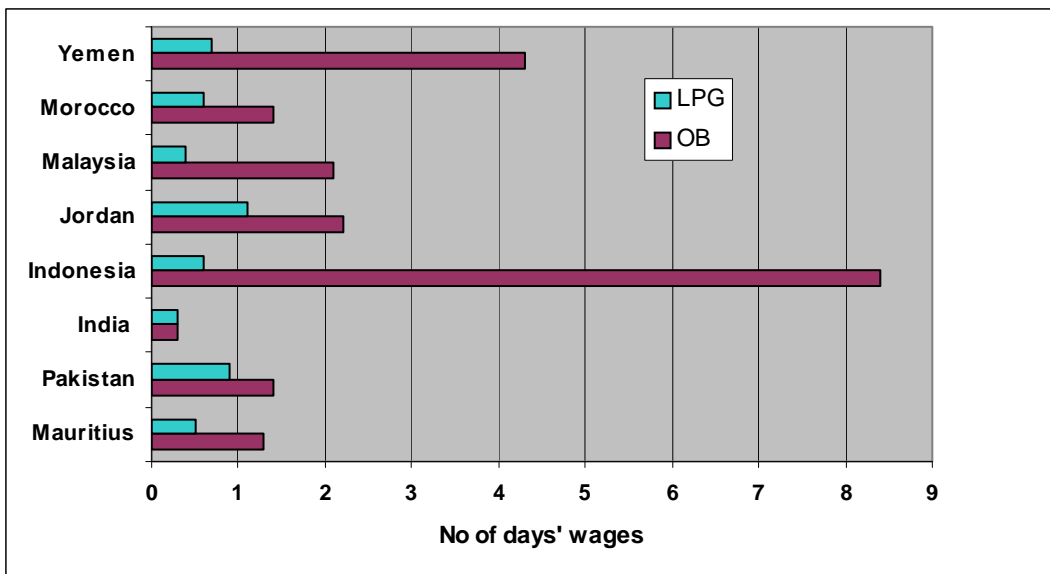


Figure 11: Number of days' wages of the lowest paid government worker needed to purchase Glibenclamide 5 mg tabs in the private sector for the treatment of diabetes

Figure 11 shows that in the selected countries, treatment of diabetes using glibenclamide 5mg tabs costs between 0.1 and 1.1 days' wages when lowest price generics are purchased from the private sector. In Mauritius, the lowest paid government worker would need to spend 0.5 day wages to purchase the lowest price generic, which is less than the affordability observed in most other countries. When the originator brand is purchased, the affordability ranges from 0.3 to 8.4 days' wages across the selected countries. In Mauritius, the lowest paid government worker would need to spend 1.3 days' wages to purchase the originator brand, which is less than the affordability observed in most other countries.

3.7.5 International comparisons of medicine price components

Figure 12 illustrates the price components in Mauritius, Ethiopia and Pakistan. In Mauritius there are fewer stages compared to the other two countries. The wholesale and retail mark-ups together contribute to 26% of the final price compared to 38% in Ethiopia and 17% in Pakistan.

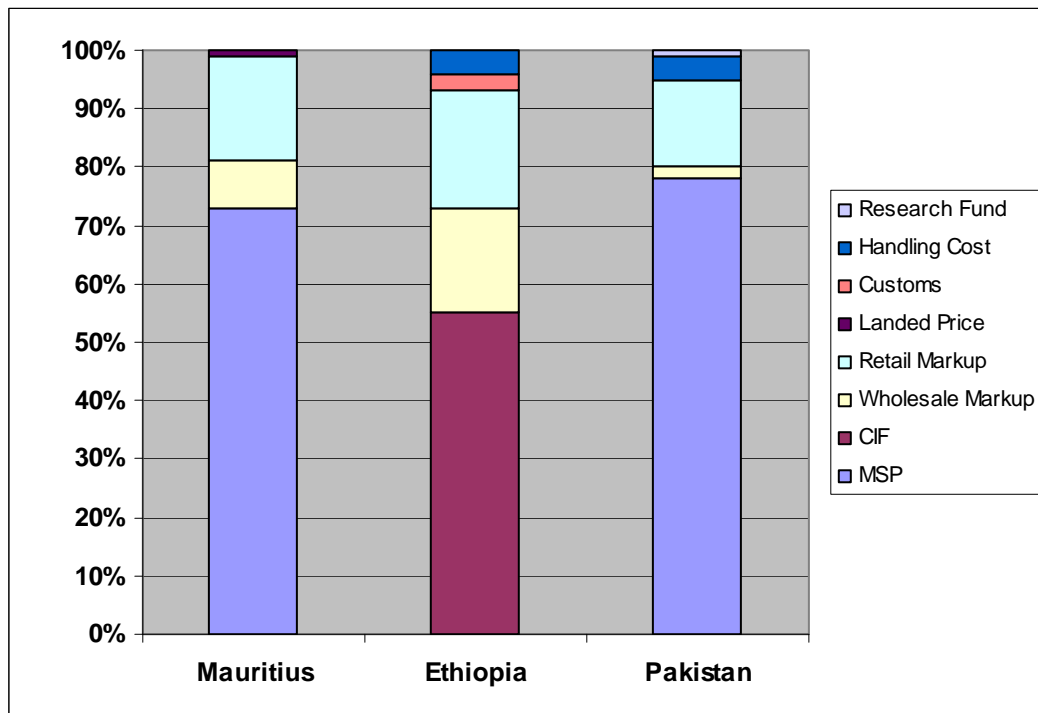


Figure 12: Price components to final price for an imported originator brand in the private sector

4. Discussion

The Mauritius Institute of Health in collaboration with the Ministry of Health and Quality of Life has carried out a nation-wide study to measure the availability and prices of 50 medicines in Mauritius using an international standardized methodology.

The public sector tend to keep only generic equivalents and the availability of these medicines in the public sector is good; the average availability across all survey medicines was 68.6%, while the availability of medicines on the EML was 71.2%.

Some particular medicines were not available in the public outlets because either they are non-listed items on the MOH&QL list e.g. captopril, cephalexin, simvastatin, or they are available in different dosage forms or strengths e.g., amoxicillin, atenolol, isosorbide mononitrate, chloroquine. In addition some medicines are available in specialized units only or where the use is only limited e.g acyclovir, ethynyl estradiol + levonorgestrel, tamoxifen, ceftriaxone inj. Some therapeutic alternatives may also be available. As far as the non-availability of brand medicines in the public sector is concerned, it may only be an issue where high quality generics are not available.

In the private pharmacies, both originator brands and generic equivalents were found; mean availability was 54.9% for generic medicines and 55.7% for originator brands. Though the availability of generics is comparable to the originator brand, generic penetration of the market is still limited due to the absence of administrative or regulatory framework to promote generic prescribing or dispensing and lack of information to the community leading to poor acceptance by consumers. It is, therefore, imperative to promote generic acceptance among health professionals and create awareness among consumers through public information and education for an improved accessibility and affordability.

The low availability of certain medicines in the private sector, e.g. ceftriaxone inj., tamoxifen tablets is explained by the fact that they are mostly hospital or institution based (i.e. they are meant for in-patients only or such institutions offering specialised care only).

No significant variation in availability was observed in the different geographical areas in the Island of Mauritius; however very low availability for both originator brand and generics was noted in the only private medicine outlet found in Rodrigues. The non-availability of many essential medicines was explained by the fact that the consignments of medicines were lying at the Customs awaiting clearance. The cause for this situation and other factors, which might explain the low availability, need to be determined. Availability in the public sector in Rodrigues compares fairly with the situation in the other health regions as it is subject to the same supply and delivery schedules.

Medicines are dispensed free of charge to all patients in the public sector. Vast majority of the medicines in the public sector are purchased against an annual open tender from international markets. Procurement of medicines can be a major financial burden to the government. Results of the survey indicate that the public procurement system is relatively efficient, as shown by purchase prices lower than international reference prices. However, this should not be a cause for complacency. All efforts should be made to maintain and further improve the efficiency of the procurement system.

Furthermore, the overhead costs of procurement which may add to the financial burden have to be kept at minimum levels. At the same time medicines procured should satisfy the criteria of quality, safety and efficacy. Wastage should be minimized through an efficient management of stocks.

In the private sector lowest price generic medicines were priced at nearly 6 times their international reference price, while originator brand medicines were priced at nearly 20 times their international reference price. The originator brand premium in the private sector is 324%, showing that patients are paying substantially more to purchase originator products as compared to lowest price generics.

In the private sector medicines were not found to be priced consistently with respect to their international reference price. Half of lowest price generic medicines were priced between 3.12 and 10.16 times their international reference price, while half of originator brand medicines were priced between 7.81 and 37.46 times their international reference price. These disparities suggest substantial variation in procurement efficiency.

The interquartile range for the median price ratios of individual medicines shows the variability in the medicine price across medicine outlets. In the private sector, for a certain number of medicines a wide amount of variation in price across outlets is observed. The high degree of variability observed between outlets is likely the result of multiple sources of importation, fluctuations in exchange rates, price changes in international markets, market competition, volume of purchase and inflation.

In the private sector, the affordability of lowest price generics was good for all conditions, with standard treatment costing about a days' wage or substantially less than the daily wage. If originator brands are prescribed and dispensed, the lowest paid government worker would need to spend between 2 to 8 days of his daily wage for a number of standard treatments. It should be noted that many people in Mauritius earn much less than the lowest government wage; as such even treatments that appear affordable in the private sector may be quite costly for the poorest segment of the population. Also multiple medicine needs on the wage earner decreases affordability.

There are no customs duties and taxes on medicines in Mauritius. In the private sector the add-on costs, such as certain charges and wholesale and retail mark-ups, contribute 27 % to the final patient price of all imported pharmaceutical products. The MSP is a high proportion of the final cost. So if the MSPs are reduced, prices should lower significantly.

Efforts should also be made to improve rational use of drugs in both the public and private sectors, and by both health professionals and consumers. To address the problem of irrational use of medicines, health planners and administrators need specific information on types, amount and reasons of irrational use. Often people are unaware that cheaper, generic alternatives exist or they do not realise that many medicines are ineffective. People also pay for medicines in the private sector when they could obtain them free of charge at public health hospital and centres. Studies show that people are willing to pay for what they consider to be good and effective remedies. Moreover, people often believe that more expensive medicines (usually brand name products) are more effective than cheaper ones. Also self-medication is a common form of therapy choice and people frequently waste money on drugs. Interventions which enable people to find cheaper alternatives for medicines, by teaching them how to identify the active component of a drug, and how to compare prices, should be encouraged and a drug information centre and network should be established. This is because such interventions additionally help to deal with the high cost of medicines, an important day-to-day concern for people who are poor. If drugs are used in more rational way, then patients are more likely to benefit to the maximum in their budget. In such circumstances loss, due to irrational use, will be minimised and on the other hand more efficient affordability will be maximised.

The results of the international comparison suggest that Mauritius generally has greater availability, comparable prices, and better affordability, than the other countries included in the analysis.

More in-depth analysis, considering additional factors like size of the markets; capabilities of the national pharmaceutical manufacturing sector; the effect of taxes; duties and mark-ups at national levels; and economic indicators (pharmaceutical supply chain, price formation mechanism or market types); is needed to reveal the reasons for variation between different countries. Such information can be useful for policymakers and governments in deciding whether any appropriate interventions can be made to make medicines more affordable and accessible in each country. Further studies and comparisons between high and low-income countries can also provide an evidence base for equity or differential pricing strategies by multinational manufacturers whereby less wealthy populations pay less than wealthier countries for essential medicines.

Strengths and limitations of the study

The results of this medicine price survey provide insight into the availability, price and affordability of medicines in Mauritius. The use of the WHO/HAI medicine prices survey has allowed for the measurement of medicine prices and availability in a reliable and standardized way that enables valid international comparisons to be made. A further strength of the methodology are the multiple steps taken to ensure data quality: training of survey personnel including a data collection pilot test; pairs of data collectors to cross-check results; double entry and verification of data into the computerized survey *Workbook*; data checker function in *Workbook* that identifies outlier or erroneous entries; and quality control checks at multiple stages.

Study results may be limited by the fact that data are inherently subject to outside influences such as market fluctuations and delivery schedules. A further limitation is that availability is determined for the list of survey medicines, and therefore does not account for the availability of alternate strengths or dosage forms, or of therapeutic alternatives. Finally, the methodology does not include informal sectors, such as markets and general stores, as the quality of the medicines found in such sectors cannot be assured.

5. Recommendations and Conclusion

The results of this preliminary analysis suggest that a mix of policies need to be implemented to make medicines more affordable and available. Although further investigation is required to obtain a more in-depth understanding of the causes and consequences of medicine pricing and availability, the results of this survey provide broad directions for future research and action. It is therefore recommended that the following steps be taken to improve medicine prices, availability and affordability:

1. *Availability*

1. There is a need for the development of a policy to allow for generic substitution.
2. Strong advocacy in practice of generic prescribing and generic substitution need to be undertaken through national campaigns to promote improved drug availability in the interest of better patient care.
3. Appropriate steps should be taken to improve availability of medicines in the private sector in Rodrigues.

2. *Procurement*

1. Use of International Reference Prices as benchmark should be encouraged for ensuring lower procurement prices in the Government Sector.
2. Maintain and improve efficiency of public procurement system

3. *Pricing*

1. Overhauling of the pricing policy mechanism is required in order to achieve a greater level of transparency, uniformity and predictability in the pricing of medicines.
2. Development of a Medicines Price Index for monitoring and assessment of medicine prices on a regular basis.
3. Adopting a suitable pricing system with a view to further improve availability and affordability:

4. *Affordability*

1. To monitor and assess the Manufacturer's Selling Price with a view to improving access of medicines to the population.
2. Awareness creation and promotion of generic acceptance in the community and among the health professionals.
3. Stimulation of generic prescribing and dispensing through incentives.
4. Encouragement of financing of medical treatment including purchase of medicines through employment – based or medical insurance schemes.

This study has helped to provide broad insight into current issues related to the price, availability and affordability of key medicines for the treatment of common conditions. The results highlight priority areas for action for the Ministry of Health and Quality of Life and others in improving access to affordable medicines. Broad debate and dialogue are now needed to identify how best different players can contribute to the prospect of enhancing accessibility and affordability to essential medicines.

Annex 1: List of Core and Supplementary Medicines

List	No.	Name	Strength	Dosage form	Originator brand	Manufacturer
Global core list	1	Amitriptyline	25 mg	cap/tab	Tryptizol	MSD
	2	Amoxicillin	500 mg	cap/tab	Amoxil	GlaxoSmithKline
	3	Atenolol	50 mg	cap/tab	Tenormin	AstraZeneca
	4	Captopril	25 mg	cap/tab	Lopril/Capoten	Bristol-Myers Squibb
	5	Ceftriaxone injection	1 g/vial	gram	Rocephine	Roche
	6	Ciprofloxacin	500 mg	cap/tab	Ciproxin	Bayer
	7	Co-trimoxazole suspension	8+40 mg/ml	millilitre	Bactrim	Roche
	8	Diazepam	5 mg	cap/tab	Valium	Roche
	9	Diclofenac	50 mg	cap/tab	Voltaren/Voltarol	Novartis
	10	Glibenclamide	5 mg	cap/tab	Daonil	Sanofi-Aventis
	11	Omeprazole	20 mg	cap/tab	Losec	AstraZeneca
	12	Paracetamol suspension	24 mg/ml	millilitre	Panadol	GlaxoSmithKline
	13	Salbutamol inhaler	0.1 mg/dose	dose	Ventolin	GlaxoSmithKline
	14	Simvastatin	20 mg	cap/tab	Zocor	MSD
Regional core list	15	Aciclovir	200 mg	cap/tab	Zovirax	GlaxoSmithKline
	16	Albendazole	400 mg	cap/tab	Zentel	GlaxoSmithKline
	17	Carbamazepine	200 mg	cap/tab	Tegretol	Novartis
	18	Cephalexin	250 mg	cap/tab	Keflex	Eli Lilly
	19	Chloroquine	150 mg (base)	cap/tab	Nivaquine	Sanofi-Aventis
	20	Co-trimoxazole	480 mg	cap/tab	Bactrim	Roche
	21	Erythromycin	250 mg	cap/tab	Erythrocin	Abbott
	22	Ferrous salt/Folic acid	200 mg (60 mg iron/400 mg folic acid)	cap/tab	No originator brand	
	23	Metronidazole	200 / 250 mg	cap/tab	Flagyl	Sanofi-Aventis
	24	Nystatin	100,000 units	pessary	Mycostatin	Bristol-Myers Squibb
	25	Oral rehydration salts	WHO formulation	sachet	No originator brand	

List	No.	Name	Strength	Dosage form	Originator brand	Manufacturer
Supplementary list	26	Acetyl salicylic acid	75 mg	cap/tab	No originator brand	
	27	Alprazolam	0.5 mg	cap/tab	Xanax	Pharmacia(Upjohn)
	28	Amlodipine	10 mg	cap/tab	Amlor / Norvasc	Pfizer
	29	Amoxicillin suspension	125 mg/5 ml	millilitre	Amoxil	GlaxoSmithKline
	30	Atorvastatin	10 mg	cap/tab	Lipitor	Pfizer
	31	Beclomethasone	250 mcg	inhaler	Becotide	GlaxoSmithKline
	32	Betamethasone valerate creme	0.10%	gram	Betnovate	GlaxoSmithKline
	33	Bisacodyl	5 mg	cap/tab	Dulcolax	Boehringer Ingelheim
	34	Chloramphenicol Optht. Drops	0.05%	ml	Chloromycetin	Parke Davis
	35	Chlorpheniramine	4 mg	cap/tab	Piriton	GlaxoSmithKline
	36	Enalapril	10 mg	cap/tab	Renitec	MSD
	37	Ethinylestradiol + levonorgestrel	0.03+0.15 mg	cycle	No originator brand	
	38	Famotidine	40 mg	cap/tab	Pepcid	MSD
	39	Fluconazole	150 mg	cap/tab	Diflucan	Pfizer
	40	Fluoxetine	20 mg	cap/tab	Prozac	Eli Lilly
	41	Fusidic acid	2%	gram	Fucidin	Leo Pharma
	42	Hydrochlorothiazide	25 mg	cap/tab	Esidrex / Dichlotride	Novartis / MSD
	43	Insulin. Neut. Sol/Isophane 30/70 (Human, Mixtard) 100 IU/ml	30/70	millilitre	Humulin	Lilly
	44	Isosorbide mononitrate	20 mg	cap/tab	Imdur / Ismo	AstraZeneca / Roche
	45	Levodopa + Carbidopa	250+25	cap/tab	Sinemet	BMS
46	Levothyroxine	0.05 mg	cap/tab	Eltroxin	GlaxoSmithKline	
47	Loperamide	2 mg	cap/tab	Imodium	Janssen-Cilag	
48	Metformin	500 mg	cap/tab	Glucophage	Merck	
49	Paracetamol	500 mg	cap/tab	Panadol	GlaxoSmithKline	
50	Tamoxifen	10 mg	cap/tab	Nolvadex	AstraZeneca	

Annex 2: Medicine data collection form

No	Generic name, dosage form, strength	Medicine Type	Brand or product name(s)	Manufacturer	Available yes/no	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
1	Acetyl salicylic acid 75 mg cap/tab	Brand	No originator brand			28				
		Lowest Price				28				
2	Aciclovir 200 mg cap/tab	Brand	Zovirax	GlaxoSmithKline		25				
		Lowest Price				25				
3	Albendazole 400 mg cap/tab	Brand	Zentel	GlaxoSmithKline		1				
		Lowest Price				1				
4	Alprazolam 0.5 mg cap/tab	Brand	Xanax	Pharmacia (Upjohn)		30				
		Lowest Price				30				
5	Amitriptyline 25 mg cap/tab	Brand	Tryptizol	MSD		28				
		Lowest Price				28				
6	Amlodipine 10 mg cap/tab	Brand	Amlor / Norvasc	Pfizer		30				
		Lowest Price				30				
7	Amoxicillin 500 mg cap/tab	Brand	Amoxil	GlaxoSmithKline		12				
		Lowest Price				12				
8	Amoxicillin suspension 125 mg/5 ml millilitre	Brand	Amoxil	GlaxoSmithKline		60				
		Lowest Price				60				

No	Generic name, dosage form, strength	Medicine Type	Brand or product name(s)	Manufacturer	Available yes/no	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
9	Atenolol 50 mg cap/tab	Brand	Tenormin	AstraZeneca		28				
		Lowest Price				28				
10	Atorvastatin 10 mg cap/tab	Brand	Lipitor	Pfizer		10				
		Lowest Price				10				
11	Beclomethasone 250 mcg inhaler	Brand	Becotide	GlaxoSmithKline		200				
		Lowest Price				200				
12	Betamethasone valerate creme 0.10 % gram	Brand	Betnovate	GlaxoSmithKline		15				
		Lowest Price				15				
13	Bisacodyl 5 mg cap/tab	Brand	Dulcolax	Boehringer Ingelheim		30				
		Lowest Price				30				
14	Captopril 25 mg cap/tab	Brand	Lopril/Capoten	Bristol-Myers Squibb		28				
		Lowest Price				28				
15	Carbamazepine 200 mg cap/tab	Brand	Tegretol	Novartis		50				
		Lowest Price				50				
16	Ceftriaxone injection 1 g/vial gram	Brand	Rocephine	Roche		1				
		Lowest Price				1				
17	Cephalexin 250 mg cap/tab	Brand	Keflex	Eli Lilly		10				
		Lowest Price				10				

No	Generic name, dosage form, strength	Medicine Type	Brand or product name(s)	Manufacturer	Available yes/no	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
18	Chloramphenicol Opht. Drops 0.050 % ml	Brand	Chloromycetin	Parke Davis		5				
		Lowest Price				5				
19	Chloroquine 150 mg (base) cap/tab	Brand	Nivaquine	Sanofi-Aventis		30				
		Lowest Price				30				
20	Chlorpheniramine 4 mg cap/tab	Brand	Piriton	GlaxoSmithKline		100				
		Lowest Price				100				
21	Ciprofloxacin 500 mg cap/tab	Brand	Ciproxin	Bayer		10				
		Lowest Price				10				
22	Co-trimoxazole 480 mg cap/tab	Brand	Bactrim	Roche		20				
		Lowest Price				20				
23	Co-trimoxazole suspension 8+40 mg/ml	Brand	Bactrim	Roche		50				
		Lowest Price				50				
24	Diazepam 5 mg cap/tab	Brand	Valium	Roche		25				
		Lowest Price				25				
25	Diclofenac 50 mg cap/tab	Brand	Voltaren/ Voltarol	Novartis		20				
		Lowest Price				20				
26	Enalapril 10 mg cap/tab	Brand	Renitec	MSD		28				
		Lowest Price				28				

No	Generic name, dosage form, strength	Medicine Type	Brand or product name(s)	Manufacturer	Available yes/no	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
27	Erythromycin 250 mg cap/tab	Brand	Erythrocin	Abbott		10				
		Lowest Price				10				
28	Ethinylestradiol + levonorgestrel 0.03+0.15 mg cycle	Brand	No originator brand			1				
		Lowest Price				1				
29	Famotidine 40 mg cap/tab	Brand	Pepcid	MSD		10				
		Lowest Price				10				
30	Ferrous salt/Folic acid 200 mg (60 mg iron/ 400 mg folic acid cap/tab	Brand	No originator brand			30				
		Lowest Price				30				
31	Fluconazole 150 mg cap/tab	Brand	Diflucan	Pfizer		1				
		Lowest Price				1				
32	Fluoxetine 20 mg cap/tab	Brand	Prozac	Eli Lilly		28				
		Lowest Price				28				
33	Fusidic acid 2% gram	Brand	Fucidin	Leo Pharma		15				
		Lowest Price				15				
34	Glibenclamide 5 mg cap/tab	Brand	Daonil	Sanofi-Aventis		30				
		Lowest Price				30				
35	Hydrochlorothiazide 25 mg cap/tab	Brand	Esidrex / Dichlotride	Novartis / MSD		20				
		Lowest Price				20				

No	Generic name, dosage form, strength	Medicine Type	Brand or product name(s)	Manufacturer	Available yes/no	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
36	Insulin. Neut. Sol/Isophane 30/70 (Human, Mixtard) 100 IU/ml	Brand	Humulin	Lilly		3				
		Lowest Price				3				
37	Isosorbide mononitrate 20 mg cap/tab	Brand	Imdur / Ismo	AstraZeneca / Roche		30				
		Lowest Price				30				
38	Levodopa + Carbidopa 250+25 cap/tab	Brand	Sinemet	BMS		30				
		Lowest Price				30				
39	Levothyroxine 0.05 mg cap/tab	Brand	Eltroxin	GlaxoSmithKline		30				
		Lowest Price				30				
40	Loperamide 2 mg cap/tab	Brand	Imodium	Janssen-Cilag		20				
		Lowest Price				20				
41	Metformin 500 mg cap/tab	Brand	Glucophage	Merck		30				
		Lowest Price				30				
42	Metronidazole 200 / 250 mg cap/tab	Brand	Flagyl	Sanofi-Aventis		20				
		Lowest Price				20				
43	Nystatin 100,000 units pessary	Brand	Mycostatin	Bristol-Myers Squibb		10				
		Lowest Price				10				
44	Omeprazole 20 mg cap/tab	Brand	Losec	AstraZeneca		14				
		Lowest Price				14				

No	Generic name, dosage form, strength	Medicine Type	Brand or product name(s)	Manufacturer	Available yes/no	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
45	Oral rehydration salts WHO formulation sachet	Brand	No originator brand			1				
		Lowest Price				1				
46	Paracetamol 500 mg cap/tab	Brand	Panadol	GlaxoSmithKline		10				
		Lowest Price				10				
47	Paracetamol suspension 24 mg/ml	Brand	Panadol	GlaxoSmithKline		50				
		Lowest Price				50				
48	Salbutamol inhaler 0.1 mg/dose dose	Brand	Ventolin	GlaxoSmithKline		200				
		Lowest Price				200				
49	Simvastatin 20 mg cap/tab	Brand	Zocor	MSD		20				
		Lowest Price				20				
50	Tamoxifen 10 mg cap/tab	Brand	Nolvadex	AstraZeneca		20				
		Lowest Price				20				

Annex 3: Explanatory Note on Availability Data

Non-availability or lower availability of certain drugs may not be so meaningful because:

- (i) The methodology requires a systematic survey of a basket of medicines including core lists of global and regional medicines (for the purpose of giving comparable data across countries participating in the survey). The pattern of diseases in Mauritius is not the same as in other countries. Mauritius has a higher prevalence of non-communicable diseases than communicable diseases.
- (ii) Some medicines were available but in a different strength; such availability was not recorded and not accounted for in the availability data as per the methodology:
 - (a) Atenolol 100 mg was available instead of Atenolol 50 mg.
 - (b) Isosorbide mononitrate 40 mg was available instead of Isosorbide mononitrate 20 mg.
- (iii) Similar, inter-changeable medicines and suitable alternatives in the same pharmacological class were also available:
 - (a) Enalapril and other antihypertensives were available instead of Captopril 25 mg.
 - (b) Other antibiotics and other cephalosporins were available instead of Cephalexin 250 mg.
 - (c) Atorvastatin 10 mg and 40 mg were available instead of simvastatin 20 mg
 - (d) Other antifungals such as Griseofulvin 500 mg and Ketoconazole 200mg were available instead of Fluconazole 150 mg.
 - (e) Gliclazide 80 mg was available instead of Glibenclamide 5 mg.
 - (f) Omeprazole 20 mg was available instead of Famotidine 40 mg which was being phased out at the time of survey.
- (iv) The availability is an indicator of the availability on the day of the survey at the outlets surveyed. It is not an indicator of the availability at the Central Supplies Division.

Some specialised drugs are not kept at primary health care units such as Area Health Centres and Community Health Centres, as the patient who may be in need of them will normally be referred to a secondary health care Unit. Some other drugs which are used for inpatient care were also not available in the primary health care units. Such drugs are available at the Central Supplies Division and only made available at the outlets on request. Examples are:- Aciclovir, Captopril, Chloroquine, Ceftriaxone injection, Fluconazole, Levothyroxine and Tamoxifen.

The limitations stated above (which are further discussed in Section 4 of the Report) influence the mean availability measure of 68.6% for the generic in the public sector which thus does not reflect the real situation of the availability of medicines. Nevertheless the indicator is a snapshot in time for the group of medicines surveyed.

Annex 4: Availability of individual medicines, public and private sector

Medicine Name	EML (yes/no)	% outlets where medicine was found Public sector (n = 30 outlets)		% outlets where medicine was found Private sector (n = 30 outlets)	
		Originator brand	Lowest price generic	Originator brand	Lowest price generic
Acetyl salicylic acid	yes		96.70%		73.30%
Aciclovir	yes	0.00%	36.40%	6.70%	70.00%
Albendazole	no	0.00%	50.00%	96.70%	23.30%
Alprazolam	yes	0.00%	75.00%	96.70%	0.00%
Amitriptyline	yes	0.00%	80.00%	3.30%	96.70%
Amlodipine	yes	0.00%	100.00%	66.70%	70.00%
Amoxicillin	yes	0.00%	16.70%	80.00%	76.70%
Amoxicillin suspension	yes	0.00%	93.30%	83.30%	73.30%
Atenolol	yes	0.00%	3.30%	90.00%	86.70%
Atorvastatin	yes	0.00%	93.30%	6.70%	100.00%
Beclomethasone	yes	0.00%	90.00%	0.00%	83.30%
Betamethasone valerate creme	yes	0.00%	96.70%	86.70%	80.00%
Bisacodyl	no	0.00%	73.30%	100.00%	13.30%
Captopril	yes	0.00%	0.00%	63.30%	40.00%
Carbamazepine	yes	0.00%	86.70%	80.00%	50.00%
Ceftriaxone injection	yes	0.00%	63.50%	30.00%	16.70%
Cephalexin	no	0.00%	0.00%	0.00%	3.30%
Chloramphenicol Optht. Drops	yes	0.00%	93.30%	0.00%	20.00%
Chloroquine	yes	0.00%	8.30%	3.30%	0.00%
Chlorpheniramine	yes	0.00%	100.00%	86.70%	10.00%
Ciprofloxacin	yes	0.00%	96.70%	0.00%	90.00%
Co-trimoxazole	yes	0.00%	100.00%	90.00%	10.00%
Co-trimoxazole suspension	yes	0.00%	96.70%	93.30%	36.70%
Diazepam	yes	0.00%	87.50%	96.70%	0.00%
Diclofenac	yes	0.00%	100.00%	96.70%	93.30%
Enalapril	yes	0.00%	100.00%	0.00%	100.00%
Erythromycin	yes	0.00%	96.70%	0.00%	36.70%
Ethinylestradiol + levonorgestrel	yes		26.70%		93.30%

Medicine Name	EML (yes/no)	% outlets where medicine was found Public sector (n = 30 outlets)		% outlets where medicine was found Private sector (n = 30 outlets)	
		Originator brand	Lowest price generic	Originator brand	Lowest price generic
Famotidine	yes	0.00%	0.00%	0.00%	90.00%
Ferrous salt/Folic acid	yes		96.70%		26.70%
Fluconazole	no	0.00%	9.10%	83.30%	90.00%
Fluoxetine	yes	0.00%	62.50%	36.70%	93.30%
Fusidic acid	yes	3.30%	91.70%	96.70%	76.70%
Glibenclamide	yes	0.00%	6.70%	96.70%	70.00%
Hydrochlorothiazide	yes	0.00%	100.00%	73.30%	0.00%
Insulin. Neut. Sol/Isophane 30/70 (Human, Mixtard) 100 IU/ml	yes	0.00%	96.70%	0.00%	56.70%
Isosorbide mononitrate	yes	0.00%	16.70%	0.00%	50.00%
Levodopa + Carbidopa	yes	0.00%	83.30%	80.00%	0.00%
Levothyroxine	yes	0.00%	73.30%	93.30%	43.30%
Loperamide	yes	0.00%	86.70%	96.70%	53.30%
Metformin	yes	0.00%	100.00%	96.70%	73.30%
Metronidazole	yes	0.00%	96.70%	96.70%	63.30%
Nystatin	yes	0.00%	6.70%	0.00%	53.30%
Omeprazole	yes	0.00%	100.00%	26.70%	100.00%
Oral rehydration salts	no		93.30%		76.70%
Paracetamol	yes	0.00%	100.00%	100.00%	93.30%
Paracetamol suspension	yes	0.00%	93.30%	96.70%	73.30%
Salbutamol inhaler	yes	0.00%	100.00%	93.30%	93.30%
Simvastatin	yes	0.00%	0.00%	13.30%	23.30%
Tamoxifen	yes	0.00%	54.50%	26.70%	0.00%

Annex 5 : Median Price Ratios, public sector procurement prices

Availability of Originator brand MPR is 0% for public sector procurement.

Hence only the lowest price generics are considered.

Medicine Name	Lowest Price Generic MPR
Acetyl salicylic acid	0.83
Aciclovir	0.99
Albendazole	0.70
Alprazolam	0.05
Amitriptyline	0.68
Amlodipine	0.02
Amoxicillin	1.15
Amoxicillin suspension	0.82
Atenolol	
Atorvastatin	0.01
Beclomethasone	0.43
Betamethasone valerate creme	0.57
Bisacodyl	1.51
Captopril	
Carbamazepine	0.49
Ceftriaxone injection	0.48
Cephalexin	
Chloramphenicol Optht. Drops	0.24
Chloroquine	1.77
Chlorpheniramine	0.96
Ciprofloxacin	0.65
Co-trimoxazole	1.03
Co-trimoxazole suspension	1.06
Diazepam	0.75
Diclofenac	0.85
Enalapril	0.18
Erythromycin	0.92
Ethinylestradiol + levonorgestrel	1.10
Famotidine	
Ferrous salt/Folic acic	0.96
Fluconazole	
Fluoxetine	0.48
Fusidic acid	0.24
Glibenclamide	

Medicine Name	Lowest Price Generic MPR
Hydrochlorothiazide	0.57
Insulin. Neut. Sol/Isophane 30/70 (Human, Mixtard) 100 IU/ml	0.65
Isosorbide mononitrate	
Levodopa + Carbidopa	0.45
Levothyroxine	0.52
Loperamide	0.50
Metformin	0.23
Metronidazole	1.19
Nystatin	1.80
Omeprazole	0.33
Oral rehydration salts	1.14
Paracetamol	1.24
Paracetamol suspension	0.55
Salbutamol inhaler	0.98
Simvastatin	
Tamoxifen	0.17

Annex 6: Median Price Ratios, private sector patient prices

Medicine Name	Originator Brand		Lowest Price Generic	
	MPR	(25 th , 75 th %iles)	MPR	(25 th , 75 th %iles)
Acetyl salicylic acid			5.34	4.10,5.34
Aciclovir			18.38	11.85,18.49
Albendazole	106.79	106.79,117.69	56.02	26.34,57.06
Alprazolam	2.77	2.74,2.86		
Amitriptyline			14.08	14.08,14.53
Amlodipine	4.91	4.61,5.34	1.25	1.18,2.92
Amoxicillin	14.38	12.90,14.38	6.71	4.11,7.32
Amoxicillin suspension	10.54	8.79,10.71	6.28	6.27,6.46
Atenolol	31.76	31.12,35.60	5.69	4.54,8.12
Atorvastatin			0.23	0.17,0.28
Beclomethasone			1.78	1.74,1.89
Betamethasone valerate creme	8.96	8.96,8.96	3.02	2.81,5.31
Bisacodyl	20.54	19.93,20.54	8.87	8.17,9.13
Captopril	20.67	20.30,20.86	3.99	3.90,4.71
Carbamazepine	10.25	9.39,10.25	2.41	2.41,3.51
Ceftriaxone injection	19.24	18.97,19.82	13.05	13.05,14.24
Cephalexin				
Chloramphenicol Optht. Drops			2.73	2.70,4.61
Chloroquine				
Chlorpheniramine	23.55	9.71,25.21		
Ciprofloxacin			10.55	7.15,14.29
Co-trimoxazole	32.27	32.27,32.32		
Co-trimoxazole suspension	12.51	12.51,12.52	10.16	9.68,12.52
Diazepam	34.76	34.53,34.86		
Diclofenac	66.64	66.64,67.31	9.55	7.78,40.77
Enalapril			3.85	3.85,3.88
Erythromycin			9.20	6.68,9.20
Ethinylestradiol + levonorgestrel			8.12	6.85,12.50
Famotidine			2.00	1.93,2.00
Ferrous salt/Folic acid			39.54	37.86,54.71
Fluconazole	110.21	107.80,110.93	14.03	12.60,18.14

Medicine Name	Originator Brand		Lowest Price Generic	
	MPR	(25 th , 75th %iles)	MPR	(25 th , 75th %iles)
Fluoxetine	102.55	99.42,107.98	5.93	5.93,6.52
Fusidic acid	1.65	1.65,1.71	0.85	0.83,0.86
Glibenclamide	45.58	45.23,45.58	19.27	8.92,24.38
Hydrochlorothiazide	28.51	27.77,39.74		
Insulin. Neut. Sol/Isophane 30/70 (Human, Mixtard) 100 IU/ml			3.12	3.12,3.20
Isosorbide mononitrate			3.04	3.01,3.05
Levodopa + Carbidopa	4.15	4.04,4.25		
Levothyroxine	3.58	3.53,4.21	3.91	3.88,3.93
Loperamide	48.61	40.90,50.08	24.80	13.13,32.46
Metformin	5.88	5.88,5.94	3.58	3.58,3.60
Metronidazole	64.03	64.03,64.03	23.30	22.87,23.75
Nystatin			9.39	9.39,9.39
Omeprazole	53.10	51.35,55.55	5.74	5.74,5.74
Oral rehydration salts			7.04	5.14,7.36
Paracetamol	19.32	19.32,19.79	3.96	3.83,6.11
Paracetamol suspension	8.46	8.38,9.02	3.91	3.52,5.86
Salbutamol inhaler	1.84	1.84,1.84	1.61	1.52,1.99
Simvastatin	13.04	13.04,13.04	7.04	7.04,7.13
Tamoxifen	5.34	5.15,5.41		