



THE REPUBLIC OF UGANDA

UGANDA MEDICINE PRICING SURVEY REPORT

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UGANDA MEDICINE PRICING

SURVEY REPORT

April 2004

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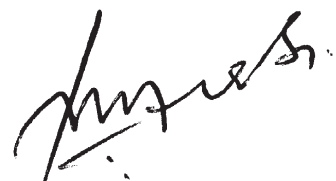
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■ Foreword

Availability and access to Medicines by patients who need them remains one of the major drivers of health care utilization in Uganda and many other low income countries. Medicines of the right quality need to be availed in the right quantities and appropriately used. Among the main barriers to access to medicines, pricing is very critical. It is important, therefore, that the most vulnerable of the population are able to afford, if they have to pay for medicines they need regardless of whether it is the public or private sector providing. The findings of this survey, the second in a row after the first one of 2002, provide yet another source of information on the performance of the National Drug Policy (NDP) and the National Pharmaceutical Sector Strategic Plan (NPSSP) 2000/01 - 2006/07. Most importantly, it provides evidence on the situation as it was on the ground in 2004 with regard to pricing of medicines. It is, therefore, our hope that readers will find this report a good reading.



Dr. Sam Zaramba

Director General Health Services

■ Acknowledgements

May I on behalf of the Ministry of Health extend sincere gratitude to all our partners who contributed to the success of this survey. I particularly thank WHO, Health Action International (Africa) (HAI/Africa) and their collaborating partners for their material, moral and technical support.

We acknowledge all the data collectors for a job well done and Mr. Mubangizi Patrick Of HAI for his time in ensuring that data analysis was well done in a timely manner. Finally we thank the Country Working Group under the leadership of Mr. Oteba Olowo Martin for their efforts and commitment to ensuring that this price survey was duly conducted.



Dr. Sam I Okware
Ag. Director Health Services (Community and Clinical)

■ List of Abbreviations

ARVs	Antiretroviral medicines
CIF	Cost Insurance and Freight
EDLU	Essential Drug List of Uganda
EDM	Essential Drugs and Medicines Policy [Department, WHO Geneva]
EML	Essential Medicines List
FOB	Free On Board
GDP	Gross Domestic Product
GFATM	Global Fund on Aids, Tuberculosis and Malaria
HAI	Health Action International
HC	Health Centre
IB	Innovator Brand
IRP	International Reference Price
JMS	Joint Medical Stores
LPG	Lowest Price Generic
MOFED	Ministry Of Finance and Economic Development
MOH	Ministry Of Health
MPR	Median Price Ratio
MSG	Most Sold Generic
NDA	National Drug Authority
NDP	National Drug Policy
NGO	Non Governmental Organization
NMP	National Medicines Policy
NMS	National Medical Stores
NSTG	National Standard Treatment Guidelines
PEPFAR	United States' President's Emergency Plan for Aids Relief
PSU	Pharmaceutical Society of Uganda
TB	Tuberculosis
TRIPS	Agreement on Trade Related Intellectual Property Rights
URA	Uganda Revenue Authority
USD	United States Dollar
Ushs	Uganda Shillings
WHO	World Health Organization

■ Executive Summary

Medicine pricing and procurement strategies are required to ensure that medicines are affordable. Price of medicines is one of the most important obstacles to access and needs to be monitored.

A field study to measure Medicine prices was carried out in Uganda using an international standardized methodology by the Ministry of Health supported by the World Health Organization and Health Action International-Africa.

Data on 45 medicines was collected in 20 public health facilities, 20 private pharmacies and 20 NGOs in four geographic and socially economic representative regions of Uganda. The price patients pay and availability of medicines was measured, the cost of treatment for specified indications calculated and compared to the lowest paid government worker and the components of medicine prices identified.

Availability of medicines

Only 11 of the 45 medicines surveyed were available in the private pharmacies as Innovator Brands while 38 of the 45 medicines were available as generics. The median availability of all the 45 medicines in generic form, which contained 28 medicines on the EDLU, in all the public health sector facilities, private pharmacies and NGOs was 55% and 80% respectively

Procurement prices

85% of the medicines at National Medical Stores (NMS) cost less than the international reference price, 72% for Joint Medical Stores (JMS). Some medicines, despite being on the Essential Drug List of Uganda (EDLU) were not found at either warehouse. Generally the prices at NMS were less than JMS.

Medicine prices in the Private and NGO sectors

The Innovator Brands were 13.6 times more expensive than the international reference price and were 5 times more expensive than the prices of their generic equivalents. There was a wide variation of prices for the same medicine within the private sector, which was wider for Innovator Brands than generics.

Some Innovator Brands were in very much higher multiples of their International Reference Price (IRP) than others. Only artemether had a greater availability of the Innovator Brand than the corresponding lowest price generic. However the price difference between the Innovator Brand and generic was low. The prices of generics were generally lower for the medicines that had a higher number of generics registered. 1st line HAART, were found in only one of the surveyed pharmacies.

Affordability of medicines

For a chronic condition, asthma, it could cost the lowest paid government worker an additional 3.6 days wages to purchase an Innovator Brand than generic salbutamol inhaler in the private pharmacies. (5.6 vs 2 days). For acute illnesses, such as pneumonia, it would take 4 days wages to buy a week's treatment course of Innovator Brand amoxicillin and 0.6 days (4.8hrs) wages to buy the generic equivalent.

For common illnesses such as malaria it would take 0.8days (6.4 hrs) wages to buy a treatment course of Innovator Brand sulfadoxine /pyrimethamine in the private pharmacies compared to 0.2days (1.6hrs) wages to buy a generic equivalent.

It takes 36 days wages to purchase Innovator Brand ranitidine for treatment of peptic ulcers compared to 2.4 days (an additional 34 days) wages to buy an alternative treatment of generic omeprazole. For a monthly treatment of hypertension using a B-blocker, such as atenolol, it takes 17days wages to purchase the Innovator Brand atenolol compared to 1day wage to purchase a generic equivalent.

Sub-Regional and International price comparisons

The medicine price surveys were done in 7 other African countries, Ethiopia, Ghana, Kenya, Nigeria, South Africa, Tanzania and Zimbabwe. In order to carry out meaningful comparison, the data for medicines on the core list was used for inter-country comparisons.

The public sector procurement prices for the 8 countries were lower than the international reference prices with a median of 0.86 times the international reference prices. In the East Africa sub-region Uganda had the highest public sector procurement prices with a median of 0.78 times the international reference prices followed by Tanzania with a median of 0.67 times and Kenya had the lowest prices with a median of 0.55 times the international reference prices.

On the contrary in the private pharmacies, Kenya had 24 Innovator Brands while Uganda and Tanzania had 2 and 6 Innovator Brands respectively. Uganda had the highest prices in East Africa for Innovator Brands of the medicines surveyed with a median of 17.48 times the international reference prices followed by, Kenya with a median of 17.33 times the international reference prices. Tanzania had the lowest prices with a median of 15.45 times the international reference prices.

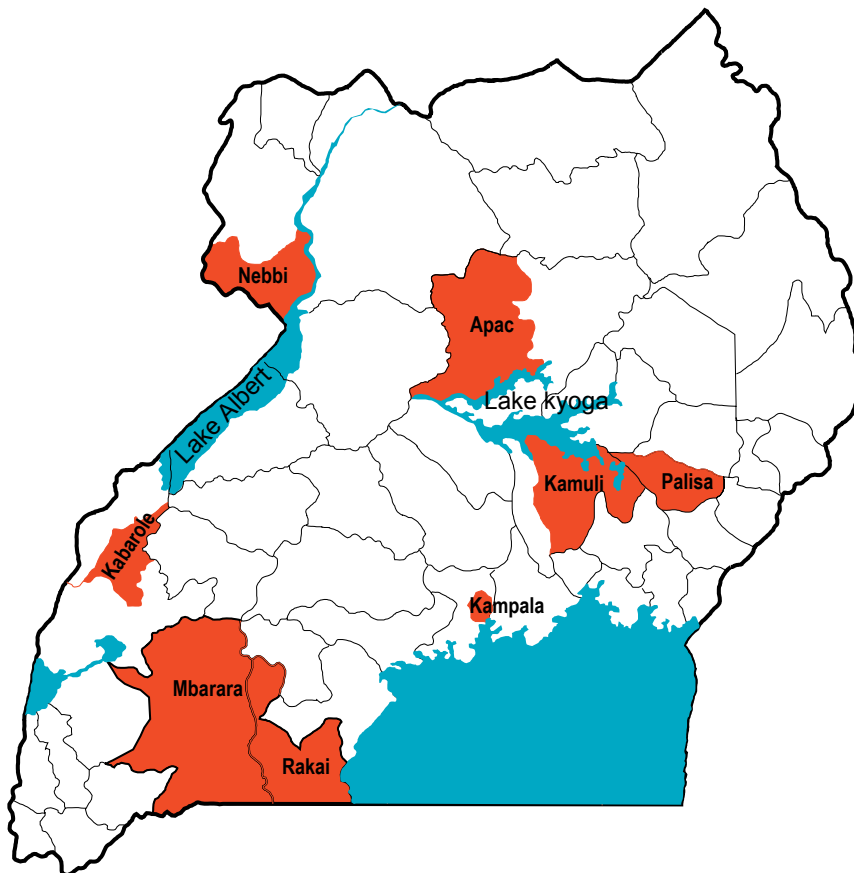
For the lowest price generics in the private pharmacies, Kenya had the highest prices in East Africa with a median of 3.58 times the international reference prices followed by Tanzania with a median price of 3.53 times and Uganda with a median price of 2.94 times the international reference prices.

¹ The lowest government worker earns \$1.31 and 65% of the population lives below the national poverty line

Price components and cumulative mark-up

In the Private pharmacies price almost doubled along the distribution chain from importer to wholesaler and then to retailer for Innovator Brand and increased almost 4 times for imported generics. In the Private pharmacies in Uganda, the mark ups vary, they constitute the clearing and handling charges (on average about 3%), while the importer mark up varies from 10-40%. The price mark ups varied from 20%-300% and medicine to medicine, with the retail markup being the highest for all the key medicines that were selected. In the public sector, the mark-up added to the tender price was 23.3% and an equivalent of 3.5% was added to cater for the insurance and freight, clearing fees, and National Drug Authority verification fees

1 | Introduction and background



1.1 Country data

Uganda has a population of about 24.7 million (2002), with a growth rate of 3.5% and 65 % live below the poverty line . Public health services cover an estimated 57% of the population; services are free. There are an estimated 247 private pharmacies, mainly in the larger towns of Kampala, Jinja, Masaka and Mbarara (2004)

² Population Census 2002, Uganda Bureau of Statistics

³ Pharmaceutical Society of Uganda report, 2004

1.1 Health Characteristics⁴

Life Expectancy (2002)	43 years
Infant Mortality Rate(2000)	88 per 1000
Maternal Mortality Ratio(2000)	504 per 100,000
Total Fertility Rate (births per woman)	6.9
Population per doctor	18,700
Population per nurse	3,065
Population per hospital bed	870
Health service physical accessibility (2002/3)	57%
Per capita health expenditure	US \$12.0
Recommended per capita health expenditure	US \$30.0

1.3 Health policy

The National Health Policy (1999) and the Health Sector Strategic Plan (HSSP, 2000/01-2004/05) were formulated within the context and the Constitution of the Republic of Uganda, 1995. The overall goal of the National Health Policy is to attain a good standard of health for all the people of Uganda in order to promote a healthy and productive life.

To achieve this goal, the government plans to create a health care system, in which all citizens have easy and equal access to appropriate and high-quality health care. Among the guiding principles of the HSSP is that primary health care shall remain the basic philosophy and strategy for national development, and a minimum health care package will form the primary focus of service delivery.

1.4 Medicines policy and funding

A new National Drug Policy which aims to contribute to the attainment of a good standard of health by the population of Uganda through ensuring the availability, accessibility and affordability at all times of essential medicines of appropriate quality, safety and efficacy and by promoting their rational use, was completed in October 2001 and endorsed.

The importation, registration and quality control of medicines is regulated by the National Drug Authority, which was established in 1993 and is charged with implementation of the National medicines policy.

⁴ Ministry of Health Statistical Abstract, 2002

⁵ Nurses and midwives combined

⁶ Health financing strategy, Ministry of Health Uganda, 2002

A 5-year National Pharmaceutical Sector Strategic Plan 2002/3-2006/7 has been developed and costed. Funding for medicines and health supplies has increased from less than US\$ 0.8 per capita at the start of the HSSP to US\$ 1.6 per capita in FY 2004/05, which still represents less than a half of the estimated requirement of US\$3.5 per capita (excluding the pentavalent vaccine currently donated through GAVI and antiretrovirals (ARVs)). The Mid-term Review concludes that this shortfall poses a serious threat to sustained availability of essential medicines and health supplies, and hence to the delivery of the Uganda National Minimum Health Care Package (UNMHCP).

Medicine budgets have been decentralized, with guidelines to protect them at all service delivery levels. However, demand for essential medicines far exceeds supply, not least because of the rapid increase in service utilization following the abolition of cost sharing in 2001. Additional funding and a policy recommendation to dedicate 50% of the non-wage budget to essential medicine at the lower levels of care have not been enough to stem high stock-out rates which compromise the quality of care .

1.5 Pharmaceutical Sector Baseline Survey 2002-Results

A pharmaceutical baseline survey conducted in 2002 with the aim of documenting the level of access to essential medicines in Uganda found out the following; in relation to availability and rational use of medicines;

- The median percentage availability of key medicines was 75% in public health facilities and 55% in district warehouses.
- The median antibiotic and injection use in public health facilities was found to be 61.9% and 29.5% respectively.
- The median percentage of the medicines on the Essential Drug Lists of Uganda (EDLU) that was prescribed was 93.5%

⁷ Ministry of Finance Planning and Economic Development, 2001

⁸ Using the WHO Operational package for Monitoring and Assessing the Pharmaceutical Situation in Countries, 2002

Summary of the findings of the pharmaceutical baseline survey-2002

Public sector facilities

Indicator	Median
Access	
Availability of key medicines	75%
Average stock out	89.3 days
% of prescribed medicines actually dispensed to patients	82.0%
Affordability	5.8days
Quality	
% of expired medicines	0%
Rational drug use	
Number of medicines prescribed per patient contact	3.2
% of patients receiving antibiotics	63.2%
% of patients receiving injections	23.1%
% of medicines prescribed on EDLU	93.5%
Adequacy of labelling	5.0%
Patient knowledge	26.6%
Prescribing according to NSTG	
Diarrhoea in children	% ORS 80%
	% antibiotics 40%
	% antidiarrhoeals 0%
	% antispasmodics 0%
Non-pneumonia ARI	% antibiotics 100%
	% antipyretics/analgesics 60%
	% cough and/or cold medicines 0%
NSTG in the facility	65%
EDLU in the facility	25%

⁹ The public health facility medicine price is the cost of the medicine from NMS or JMS price catalogue and not the cost paid by the patient since medicines are free in public health facilities. The cost refers to what it costs for public health facility to provide the medicine to patients.

¹⁰ Adequate medicine labelling by the dispenser constitutes medicine, individual dosage, and duration specific plus any additional criteria specified in the NSTG.

¹¹ Patient knowing the name of all the medicines, what they are for, and how they should be taken, plus any additional criteria specified in the NSTG.

¹² Retrospectively sampled cases by diagnosis to determine, if they complied with the specific recommendation in the NSTG.

Private medicine outlets

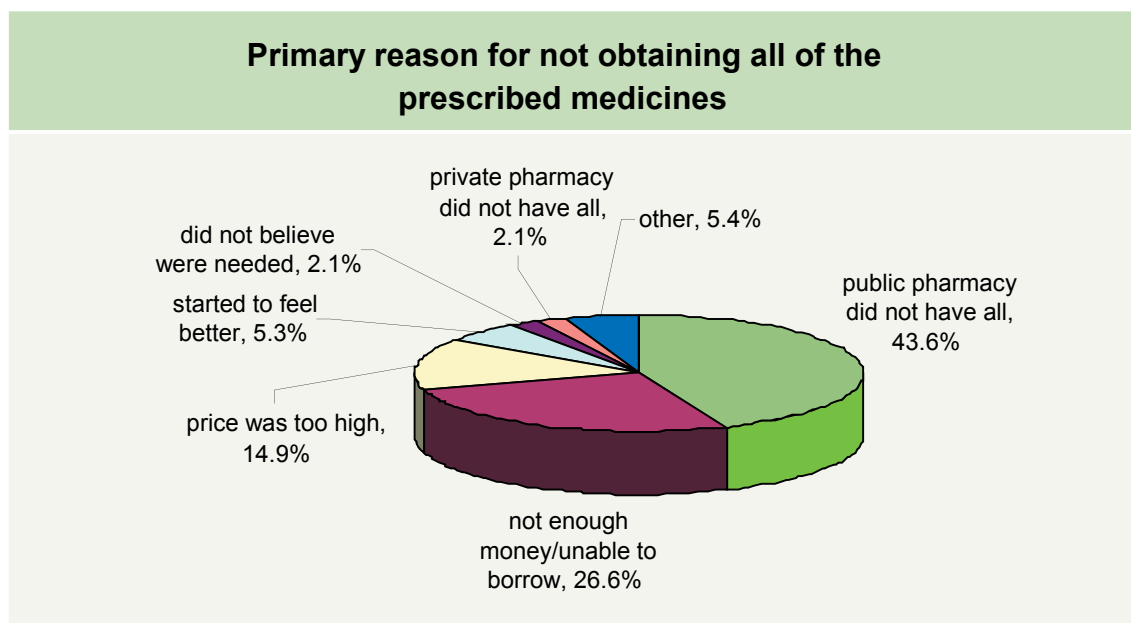
Indicator	Median
% of medicines expired	0%
Affordability	6.8 days

District warehouses (warehouses supplying the public sector)

Availability of key medicines	55%
Average stock out	182 days

Household survey results

In this survey, it was found out that for a majority of Ugandans, the first consultation when they are sick is done at the clinic or hospital in the public health care facilities or private sector. The respondents were asked the reasons as to why, whereas there after consultation there were prescriptions but a significant number of the population left the facilities without all the prescribe medicines.



Primary reason of not obtaining medicines

- In 87.2% of cases, availability and price were stated as the primary factors
- Of these 45.7% were related to availability in either the public or private sectors and
- 41.5% related to price and or availability of money

¹³ Ratio of the cost of treating moderate Pneumonia without hospitalisation and the lowest government wage.



2 | Methodology

During April 2004, a field study on measuring the prices of medicines was carried out in Uganda. The fieldwork was based on a methodology developed by the World Health Organization (WHO) and Health Action International (HAI) using a short list of medicines in order to compare prices in different health sectors. The methodology, which is described in the manual, *Medicines Prices: A new approach to measurement* (WHO/HAI, 2003) has been designed for the collection, analysis and interpretation of medicines prices in a standardized way. It also enables the composition of medicines prices to be investigated.

The study was carried out by Ministry of Health in collaboration with HAI Africa and the WHO Uganda country office

2.1 General Objective:

To document and compare the prices of medicines in different parts of the health sector and to compare them with those in other countries so as to inform the National Drug Policy thereby contributing to the increased access to Essential Medicines in Uganda.

2.2 Specific Objectives:

- Systematically collect information on variations of prices and availability of the same medicines in different parts of the health sector in Uganda.
- Establish the ability of low income earners to pay for treatment of illnesses
- Compare national procurement prices with international reference prices and with local retail prices
- Establish the impact of generic competition on prices of medicines in Uganda
- Establish the contributory effect of the mark ups to the retail prices of medicines

2.3 Sampling

The country was divided into 4 regions; Eastern, Central Northern, Western. The public referral hospitals were purposively selected to represent the 4 regions of Uganda. Kampala District with Mulago National referral Hospital was selected because of its cosmopolitan characteristics. The referral hospitals were then used as anchors around which the surrounding smaller public facilities, private pharmacies and NGOs were randomly selected. The smaller public health facilities were drawn from the list of public health facilities served by the referral hospital. The selection of private pharmacies was random from a pool of pharmacies within 5km of each public health facility. This method was also used for the NGO facilities based on lists obtained from the Ministry of Health

Western	Northern	Eastern	Kampala
5 Public Health facilities (inclusive of 1 regional referral hospital)	5 Public Health facilities (inclusive of 1 regional referral hospital)	5 Public Health facilities (inclusive of 1 regional referral hospital)	5 Public Health facilities (inclusive of 1 regional referral hospital)
5 retail pharmacies	5 retail pharmacies	5 retail pharmacies	5 retail pharmacies
5 NGO health facilities	5 NGO health facilities	5 NGO health facilities	5 NGO health facilities

2.4 List of Medicines Surveyed

The survey documented the prices of 45 essential medicines in the public sector, private pharmacies, and NGO sector.

Table 2.2 Number of medicines surveyed

Number of medicines on the WHO/HAI core list Surveyed	25
Number of medicines on the supplementary list	20
Total number of medicines surveyed	45

25 medicines were drawn from the WHO/HAI core list of medicines to enable comparisons between countries. Uganda was able to select a supplementary list of 20 medicines based on the disease burden and availability on the Essential Drug List. 6 ARVs were included because of the severity of the AIDS pandemic in Uganda: thousands of Ugandans need urgent access to ARVs, and thus it was imperative to survey their prices and document their availability. The complete medicines list is attached as **Annex 1**. 28 of the total medicines that were surveyed are on the EDLU.

Though diclofenac 25mg was retained on the core list, it was not found to be available in any of the facilities surveyed. For each medicine, the prices of up to three different products were monitored

- **Innovator Brand**
- **Most sold generic equivalent:** This is the generic form of a given product as determined from a mini-survey by telephone of regional Wholesale pharmacies based on the volumes of sales. The most sold generic for each medicine was the same throughout the country.
- **Lowest price generic equivalent:** The generic form of a product as obtained at the time of data collection from each individual pharmacy surveyed. The lowest price generic for each medicine varied from pharmacy to pharmacy

2.5. Data collection

A standardized data collection form was used, and data collectors were trained in a two-day workshop to ensure the reliability and reproducibility of the survey. A small pilot study was also undertaken in areas around Kampala District, which gave hands on experience to the data collectors and identified problems, which were solved by the end of the training

During the formal survey, public procurement prices (tender prices) and availability were recorded at the National Medical Stores (NMS) and the Joint Medical Stores (JMS). At the public health facility, where medicines are free, only the availability of the medicines surveyed was documented. The availability and prices of medicines in both the private pharmacies and NGO health facilities were documented by physical visits. Interviewing responsible personnel in the relevant bodies identified price components.

2.6 The Survey Team

A survey team was composed of 20 data collectors. Half of the survey team consisted of health related representatives from the Ministry of Health in each region, and half were representatives from the NGO sector who had knowledge about medicine access and pricing issues. 4 regional sub-teams were selected and a pharmacist based in each region was designated as a supervisor. Data collection was completed in one week.

2.7 Ethical Considerations

The study was not expected to raise any significant ethical issues because its methods have been regularly employed in similar studies in Uganda. The issues studied fell within the

¹⁵ Country representatives of the pharmaceutical manufacturers, NDA officials, Clearing agents and officials of URA.

regular activities and mandate of the Ministry of Health (MOH), which commissioned the study. However, permission was sought and obtained from district authorities and private medicine outlets before the actual survey could be conducted.

Introductory letters by the Director General of Health Services in the MOH were given to data collectors to present during their site visits. Confidentiality was ensured for all information collected, and no reference was made to specific patient names or study units.



3 | Results

The data from the survey are not presented in actual currency units but, rather, results are expressed as median price ratios (MPRs) calculated using international reference prices. Reference prices are internationally available lists of prices against which the local prices are compared by means of a ratio. 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 imply that the local medicine price is twice that of the international reference price. Median price ratios facilitate cross-country comparisons of medicine price survey. Comparison of two MPR's within or between sectors eliminates the international reference price from the denominator and is therefore equivalent of a direct currency unit comparison.

The Management Sciences for Health (MSH) reference prices, taken from the International Drug Price Indicator Guide (2003), are the medians of recent procurement or tender prices offered by not-for-profit suppliers to developing countries for multi-source products. The MSH reference prices are therefore relatively low and represent efficient bulk procurement without the costs of shipping or insurance.

In general, public sector procurement prices for the most sold and lowest price generically equivalent products should be fairly close to the MSH international supplier/tender prices (that is, ratios up to 1.00). The prices of medicines were calculated only for medicines found to be available in at least 4 facilities.

Exchange rate

All prices were converted to US dollars using the exchange rate (1\$= UShs 1,910) of 26 April 2004, the first day of the survey.

The components of medicines prices were also identified in order to make an estimate of the manufacturers' prices, to better understand a medicine's final price, and exactly how it is constructed.

Daily wage

The daily wage of the lowest paid government worker at the time of the survey was found to be UShs 2,500.

Note on use of medians and means

The median is the value that divides the distribution in half. The median is a useful descriptive measure if there is an asymmetrical distribution of the data or there are one or two extremely high or low values, which would make the mean unrepresentative of the majority of the data.

Median values are used throughout the presentation of results and discussion as a better representation of the midpoint value.

Although the survey examined a basket of 45 medicines, the issues found are likely to apply to a larger range of medicines on the Ugandan market.

The findings of the survey are presented in the following analysis:

- 3.1 Medicines in the private for profit pharmacies
- 3.2 Procurement prices in the public sector
- 3.3 Medicines availability in the public health facilities
- 3.4 Availability of medicines in the NGO sector
- 3.5 Affordability of medicines in the private sector
- 3.6 Regional and International price comparisons
- 3.7 Price components and cumulative mark ups

3.1 Medicine Prices in the Private-for-Profit Sector (Private pharmacies)

The table 3.1 is a representation of the summary of the Prices that patients pay in comparison with international reference prices for all medicines surveyed in the private sector.

Table 3.1: Patient prices in the private pharmacies in comparison with international reference prices for 45 medicines

	No of medicines found	Median Price ratio (MPR)	25th percentile	75th percentile
Innovator Brand	11	13.6	7.5	25.6
Most sold generic equivalent	34	2.7	2.0	4.2
Lowest Price Generic equivalent	38	2.6	1.7	3.6

¹⁶ MPR is the number of times how the local medicine price is more expensive than the international reference prices

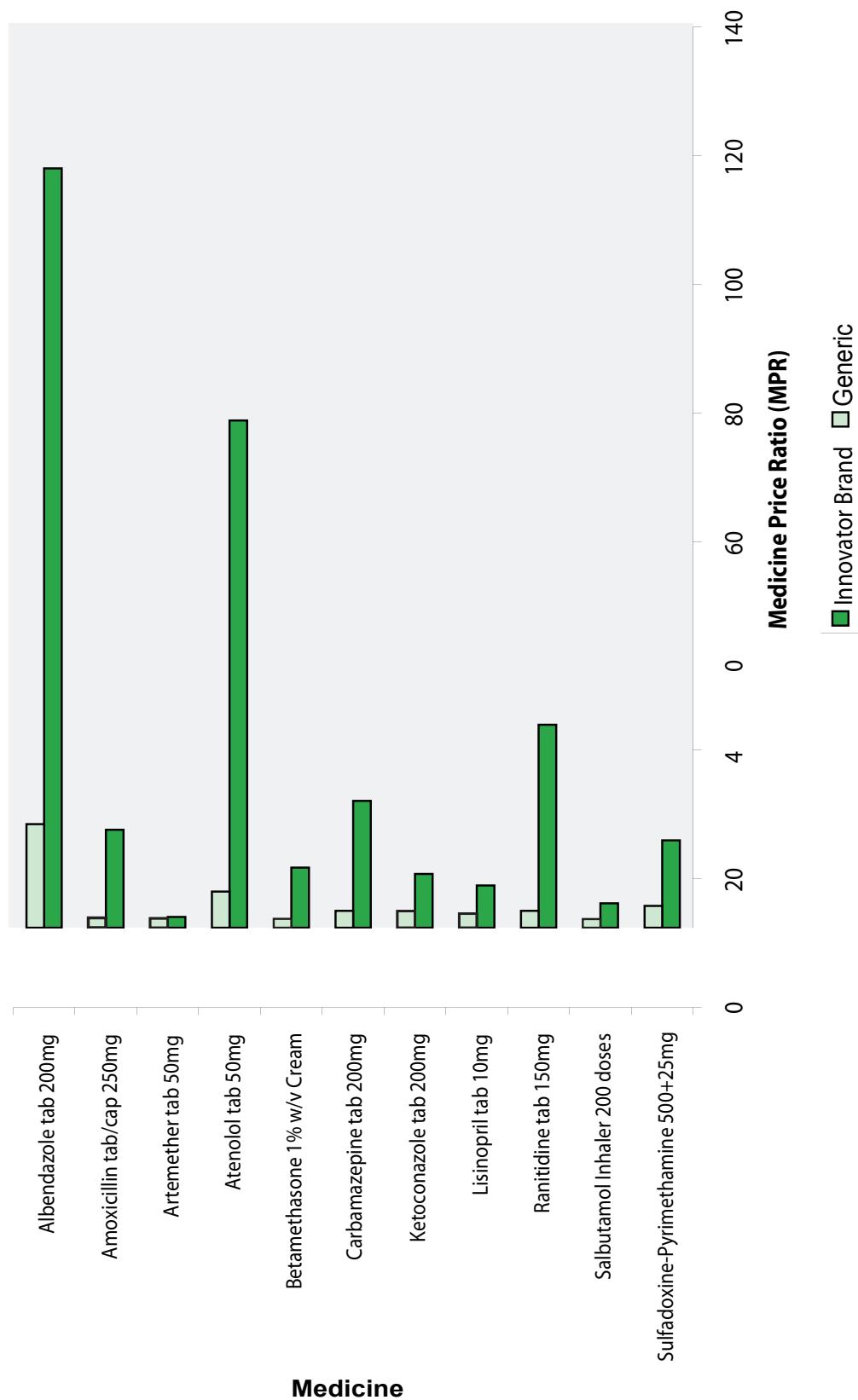
Innovator products were not found to be widely available in the private pharmacy sector: of the 41 medicines found from any manufacturer in the private pharmacies during the survey from the total list of medicines surveyed (45).

- The Median of the MPRs for the available Innovator Brand products, were found to be priced at 13.6 times the international reference prices.
- There was a wide variation of prices, with half of the available Innovator Brand medicines surveyed, with half of the medicines being sold in the range of 7.5-25.6 times the international reference price.
- The median of the MPRs of the Most Sold Generic equivalents was 2.7 times the international reference price, with half of the medicines being sold in the range of 2.0 and 4.2 times the international reference prices.
- The median of the MPR of the lowest priced generic equivalent was 2.6 times the international reference price, with half of the medicines being sold in the range of 1.7-3.6 times the reference prices.

Table 3.2 Comparison of patient prices of Innovator Brands and Generics for the 11 medicines in private pharmacies

	Median Price Ratio of Innovator Brand	Median Price Ratio of the lowest price generic
Albendazole tablet 200mg	118.02	16.09
Amoxicillin tablet 250mg	15.22	1.52
Artemether tablet 50mg	1.68	1.45
Atenolol tablet 50mg	78.82	5.63
Betamethasone 1% w/v cream	9.33	1.40
Carbamazepine tablet 200mg	19.73	2.63
Ketoconazole tablet 200mg	8.36	2.61
Lisinopril tablet 10mg	6.57	2.19
Ranitidine tablet 150mg	31.54	2.63
Salbutamol inhaler	3.78	1.35
Sulfadoxine-pyrimethamine tablet (500/25mg)	13.58	3.4

Fig. Comparison of prices of Brands and Generics - Private Sector



¹⁷ Only 11 medicines had both innovator brands and generics in the private pharmacies surveyed.

Comparison of prices of Brands and Generics- Private pharmacies

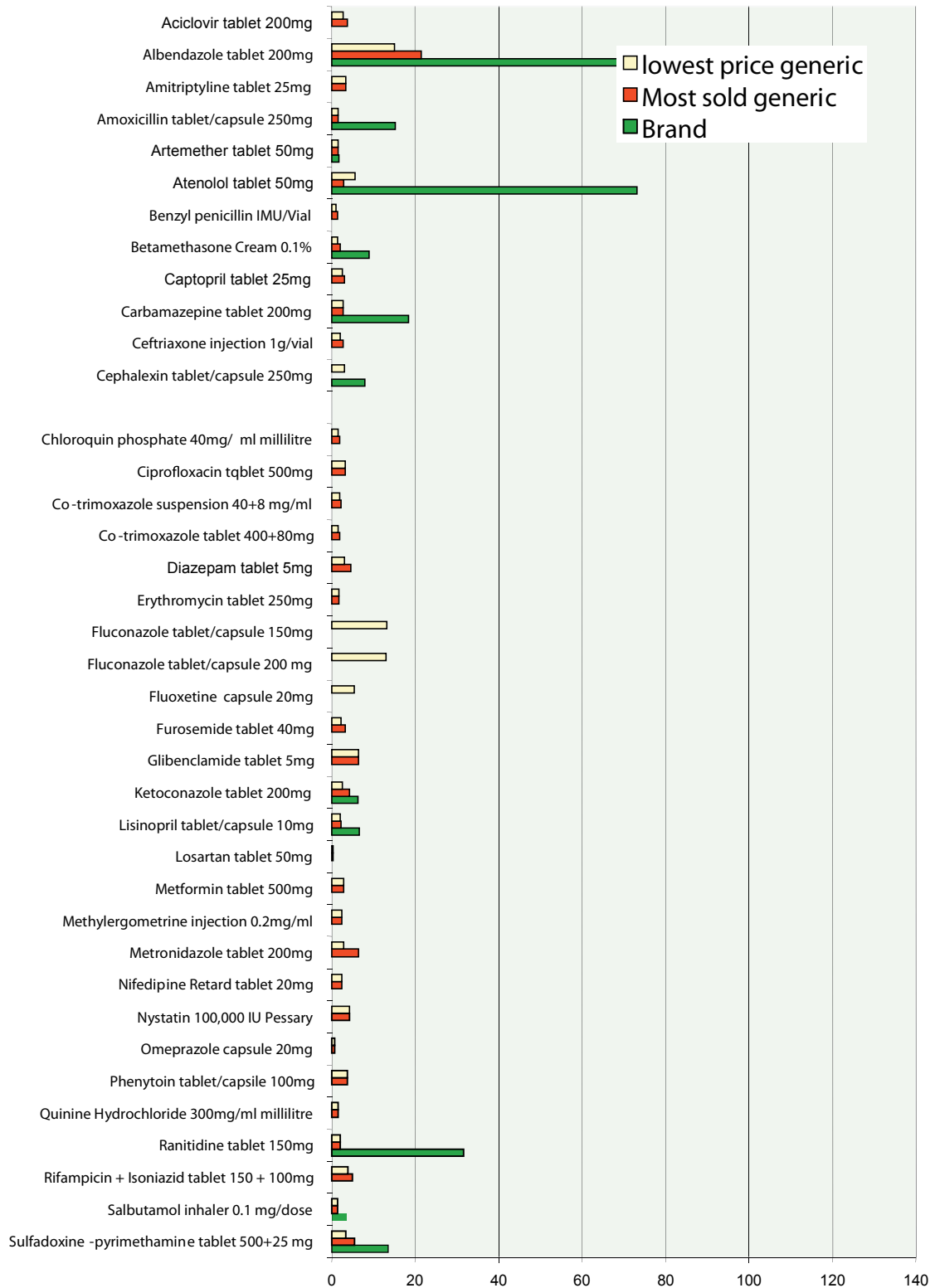
Table 3.2 above and fig. 3.1 illustrate the differences in prices between Innovator Brands and lowest price generics for the medicines which had the two forms available in

- Only 11 Innovator forms were found in one or more pharmacies
- The Innovator Brands were on average 5.2 times more expensive than the lowest priced generic products.
- Albendazole, Amoxicillin, Atenolol, carbamazepine, Ranitidine and Sulphadoxine + Pyrimethamine had Innovator Brands which were more than 10 times more than the International Reference Price.

Recommendations.

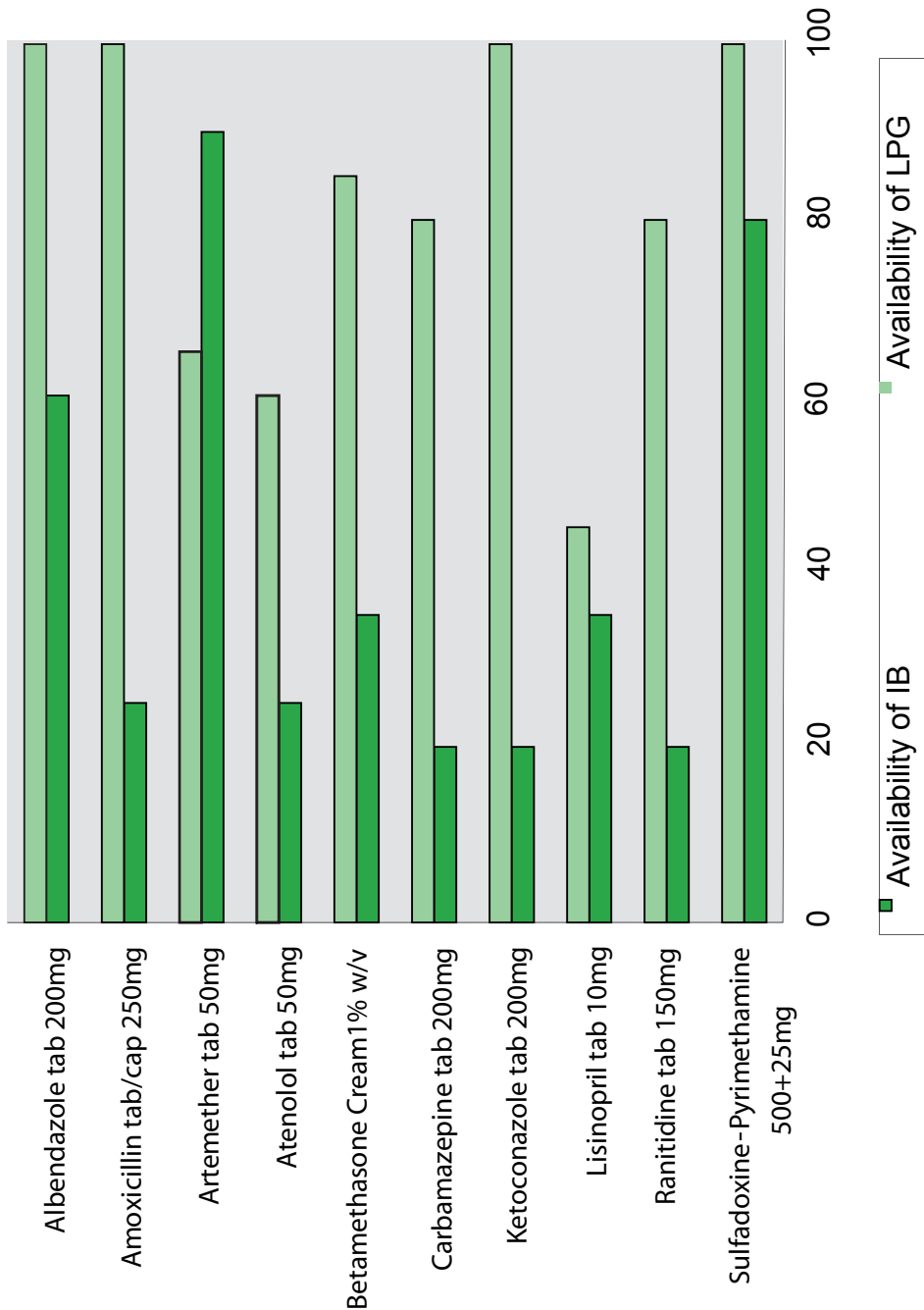
- Develop and implement clear mechanisms for promoting of Generic acceptance by health professionals. Such mechanisms include the enforcement of use of National Standard Treatment Guidelines by the Private sector.
- Promote prescribing and use of medicines by generic name in public and private health sectors through the development of a formal generic prescribing and substitution policy enshrined in law.
- A medicines pricing policy needs to be developed and implemented in order to achieve a greater level of transparency, uniformity and predictability in the pricing of medicines in Uganda. Such a policy will be of great assistance in the determination and effective implementation of pro-poor interventions aimed at increasing access to essential medicines
- Design strategies to promote the acceptance of quality generics by consumers, which are more affordable than Innovator Brands

Fig 3.2. Comparison of prices for Innovator products to the most and lowest priced generic for all medicines-Private pharmacies



● Innovator Brands were generally more expensive than the generic equivalents

Fig 3.3 Percentage availability of Innovator Brands and Lowest price generics-Private pharmacies



Percentage availability of Innovator Brands and Lowest price generics

- Only Artemether had a higher percentage availability of the Innovator Brand compared to the Lowest priced generic
- Generics were generally more available than corresponding Innovator Brands

Table 3.3 Comparison of Percentage availability and Prices between Innovator Brands and Generics in private pharmacies

	No of times more expensive Innovator Brand to lowest price generic	Availability of Innovator Brand	Availability of lowest price generic	Comment
Albendazole tablet 200mg	7.3	60%	100%	
Amoxicillin tablet 250mg	10.0	25%	100%	
Artemether tablet 50mg	1.2	90%	65%	Low differential
Atenolol tablet 50mg	14.0	25%	60%	
Betamethasone cream 0.1%	6.7	35%	85%	
Carbamazepine tablet 200mg	7.5	20%	80%	
Ketoconazole tablet 200mg	3.2	20%	100%	
Lisinopril tablet 10mg	3.0	35%	45%	
Ranitidine tablet 150mg	12.0	20%	80%	
Salbutamol inhaler	2.8	20%	95%	
Sulfadoxine-pyrimethamine tablet (500/25mg)	4.0	80%	100%	

Comparison of Percentage availability and Prices between Innovator Brands and Generics

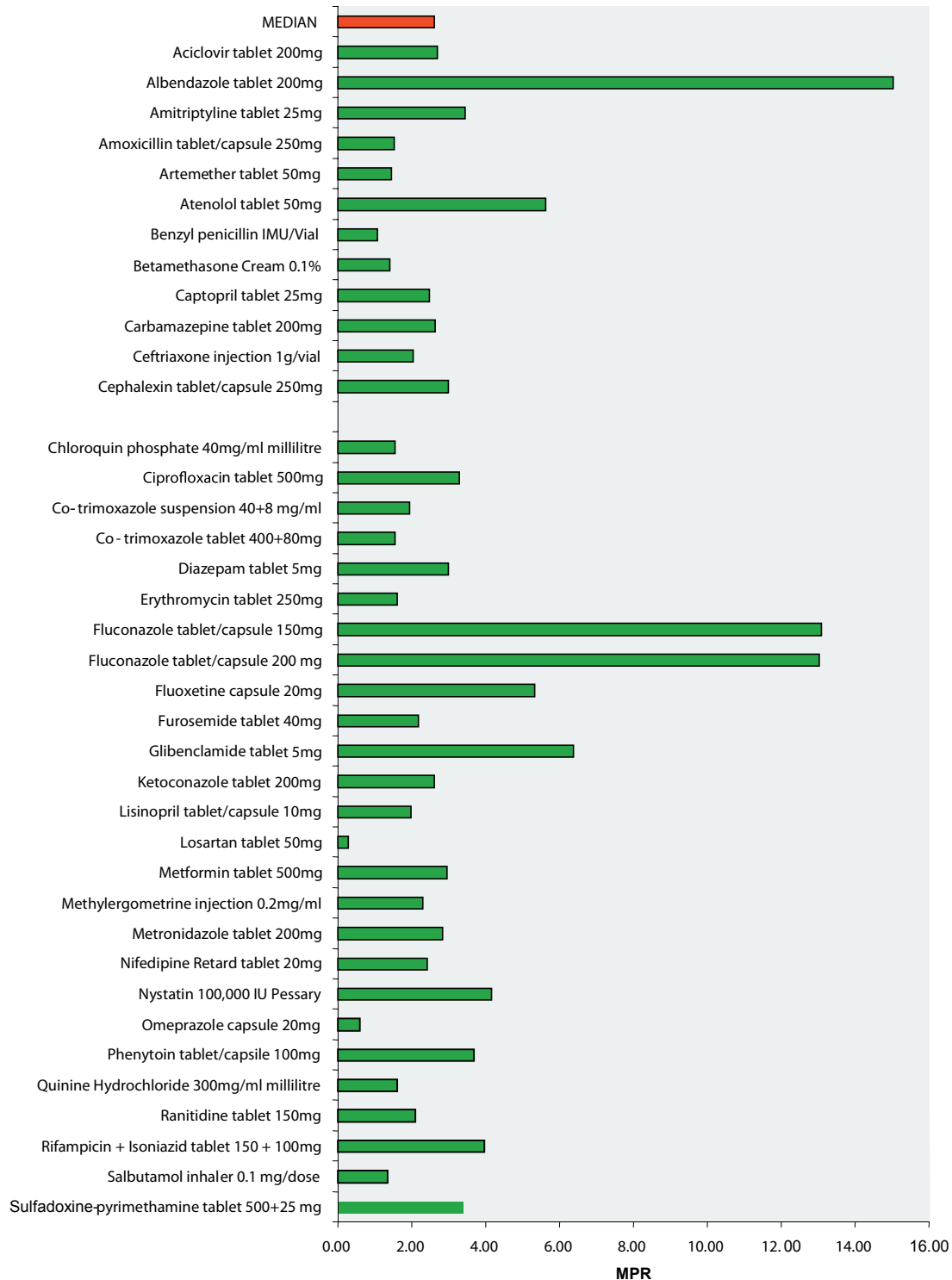
Some Innovator products more than 10 times more expensive than the lowest priced generics

- Only with artemether, was the Innovator product marginally more expensive than the lowest priced generic despite the fact that the Innovator Brand was more available than the lowest priced generic
- Some medicines such as albendazole, and sulfadoxine-pyrimethamine were found to be widely available and hence probably purchased and used in both forms despite the Innovators being 730% and 400% more expensive than the lowest price generic.

Recommendation

- Design strategies to promote the acceptance of quality generics by consumers, which are more affordable than Innovator Brands.

Fig 3.4. MPRs for lowest price generics - Private Pharmacies



- The generics medicines surveyed was 2.6 times the International reference prices
- 40% of the generics surveyed in the private pharmacies were more than 2.6 times more expensive than the international reference Price.

Medicines undergo a rigorous process of registration by the National Drug Authority which on average takes 3-6months to complete. The table 3.4 below illustrates the effect of generic competition on the prices of medicines in private pharmacies

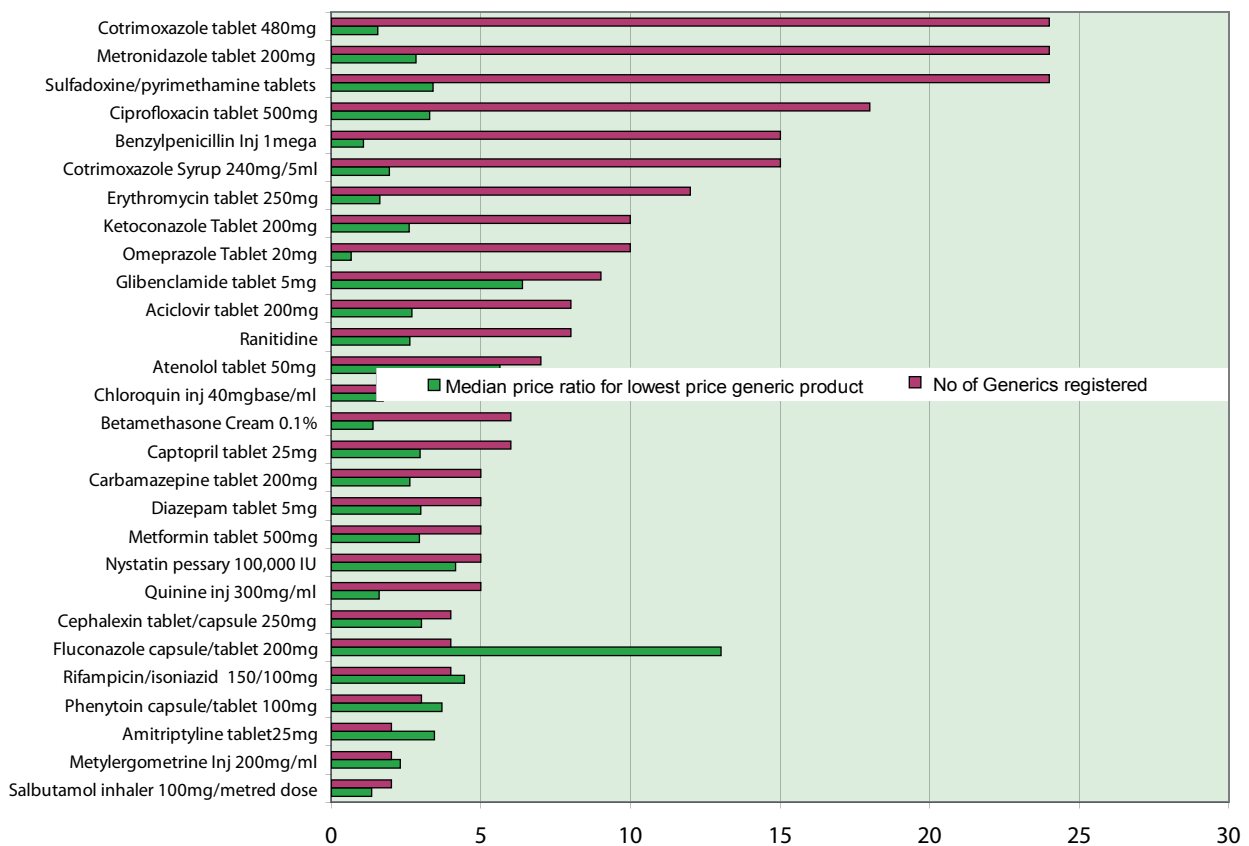
Table3.4. Comparison of prices of Medicines on the EDLU with number of Generics registered in private pharmacies

	Median price ratio for lowest price generic product	Median price ratio for Innovator product (where available)	Present on the essential Drug list of Uganda (Y/N)	Number of generics registered in Uganda
Aciclovir tablet 200mg	2.7		Y	8
Amitriptyline tablet 25mg	3.4		Y	2
Atenolol tablet 50mg	5.6	78.8	Y	7
Benzylpenicillin Inj 1mega	1.1		Y	15
Betamethasone Cream 0.1%	1.4		Y	6
Captopril tablet 25mg	3.0		Y	6
Carbamazepine tablet 200mg	2.6	19.7	Y	5
Cephalexin tablet/capsule 250mg	3.0		Y	4
Chloroquin inj 40mgbase/ml	1.7		Y	7
Ciprofloxacin tablet 500mg	3.3		Y	18
Cotrimoxazole Syrup 240mg/5ml	1.9		Y	15
Cotrimoxazole tablet 480mg	1.5		Y	24
Diazepam tablet 5mg	3.0		Y	5
Erythromycin tablet 250mg	1.6		Y	12
Fluconazole capsule/tablet 200mg	13.0		Y	4
Glibenclamide tablet 5mg	6.4		Y	9
Ketoconazole Tablet 200mg	2.6	8.4	Y	10
Metformin tablet 500mg	2.9		Y	5
Metronidazole tablet 200mg	2.8		Y	24
Metylergometrine Inj 200µg/ml	2.3		Y	2
Nystatin pessary 100,000 IU	4.2		Y	5
Omeprazole Tablet 20mg	0.7		Y	10
Phenytoin capsule/tablet 100mg	3.7		Y	3
Quinine inj 300mg/ml	1.6		Y	5
Ranitidine tablet 150mg	2.6	31.5	Y	8
Rifampicin/isoniazid 150/100mg	4.5	Y	4	
Salbutamol inhaler 100µg/metred dose	1.4	3.8	Y	2
Sulfadoxine/pyrimethamine tablets 500+25mg	3.4	13.6	Y	24

Comparison of Prices of Medicines on the EDLU with number of Generics registered

- Medicines on the EDLU with a higher number of generics registered had generally lower prices compared to the corresponding International Reference Prices.
- Medicines with a few generics registered had higher prices compared to the international reference prices.

Fig. 3.5. No of Generics registered in Uganda and their Prices



Number of Generics registered in Uganda and their Prices

- The prices of Generics were generally low for the medicines that had a high number (more than 5) generics registered. Despite having a few generics registered, Salbutamol, Quinine Inj and Acyclovir had low MPRs.
- Despite having more than 5 generics registered, Glibenclamide 5mg, Sulphadoxine/ Pyrimethamine 500+25mg, Ciprofloxacin 500mg, Atenolol 50mg had high MPRs.

Recommendation

- Improve the efficiency and strengthen the National Drug Authority to ensure fast track registration and approval of more varieties of quality generics so as to encourage generic competition.
- Design strategies which encourage lowering of prices of medicines where they have been found to be high compared to international prices by exploring alternative sources of medicines such as local production.

Contrary to other sectors, in the private pharmacies all forms of medicines i.e. Innovator Brands and generics were available. The tables 3.6 and 3.7 below illustrate the percentage availability of Innovator Brands and generics respectively

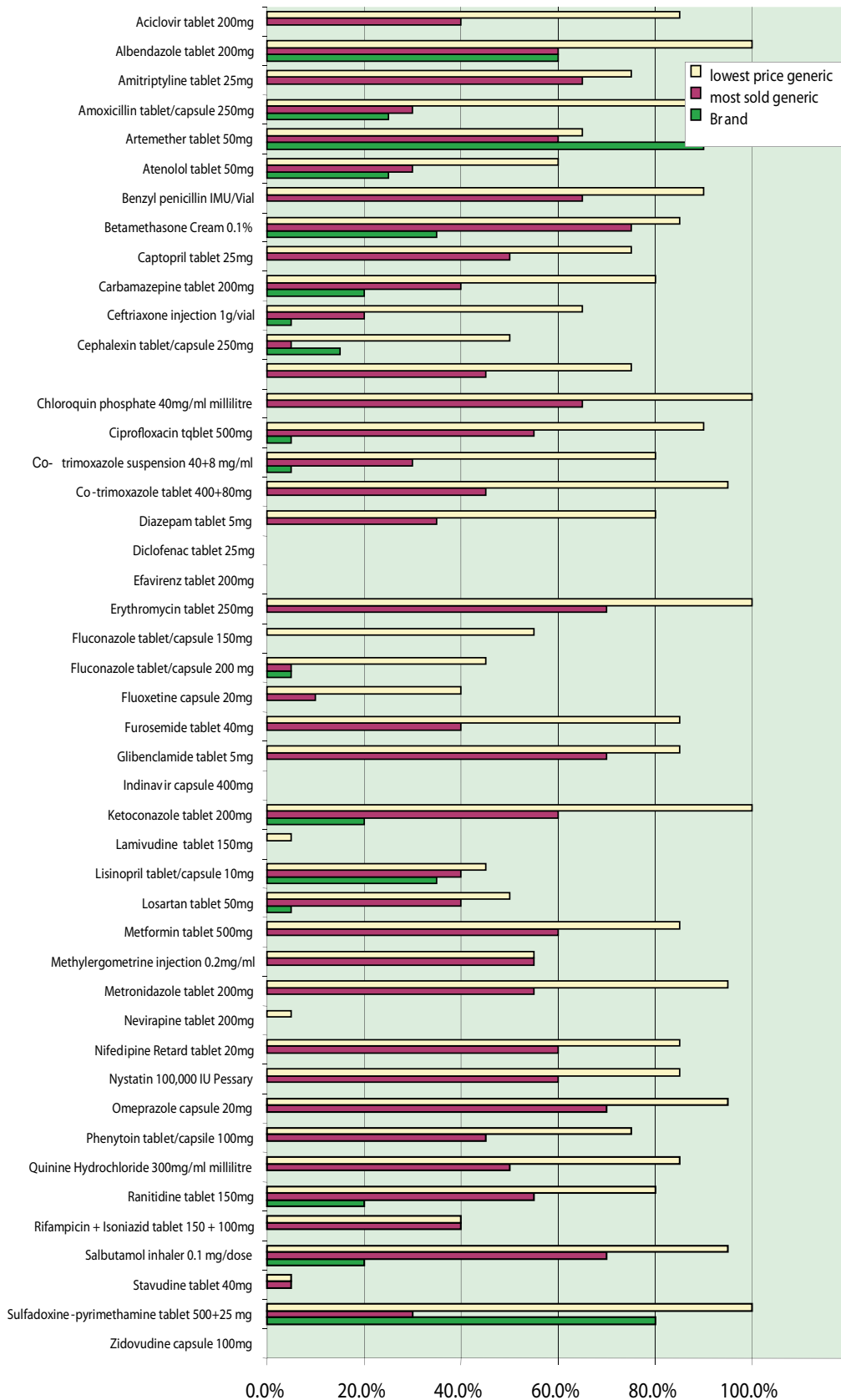
Table 3.6. Percentage availability of the Innovator Brands

2 medicines were found in 75-90% of the pharmacies	<ul style="list-style-type: none"> ■ Artmether tab 50mg ■ Sulfadoxine/Pyrimethamine tab 500+25mg
2 medicine were found in 50-75% of the pharmacies	<ul style="list-style-type: none"> ■ Albendazole tab 200mg
12 medicines were found in less than 50% of the pharmacies –	<ul style="list-style-type: none"> ■ Amoxicillin capsule 250mg ■ Atenolol tablet 50mg ■ Betamethasone cream 0.1% ■ Carbamazepine tablet 200mg ■ Ceftriaxone inj 1g/vial ■ Cephalexin tab/capsule 250mg ■ Cotrimoxazole suspension 120mg/5ml ■ Fluconazole capsule 200mg ■ Lisinopril tab 10mg ■ Ketoconazole tab 200mg ■ Salbutamol inhaler ■ Ranitidine 150mg.

Table 3.7. Percentage availability of lowest price generics

<p>6 medicines were found in all the pharmacies</p>	<ul style="list-style-type: none"> ■ Albendazole tab 200mg ■ Amoxicillin capsule/tablet 250mg ■ Chloroquin inj 40mg/5ml ■ Erythromycin capsule/tablet 250mg ■ ketoconazole tablet 200mg Sulfadoxine/Pyrimethamine 500+25mg
<p>21 medicines were found in more than 75% but not in all the pharmacies</p>	<ul style="list-style-type: none"> ■ Aciclovir tablet 200mg ■ Amitriptyline tablet 25mg ■ Benzylpenicillin IMU/vial ■ Betamethasone Cream 0.1% ■ Captopril tablet 25mg ■ Carbamazepine tablet 200mg ■ Ciprofluoxacin tablet 500mg ■ Co-trimoxazole tablet 400+80mg ■ Co-trimoxazole suspension 40+80mg ■ Diazepam tablet 5mg ■ Furosemide tablet 40mg ■ Glibenclamide tablet 5mg ■ Metformin tablet 500mg ■ Metronidazole 200mg ■ Nifedipine Retard tablet 20mg ■ Nystatin 100,000IU Pessary ■ Omeprazole capsule 20mg ■ Phenytoin tablet/capsule 100mg ■ Quinine Hydrochloride inj 300mg/ml ■ Ranitidine tablet 150mg ■ Salbutamol Inhaler 0.1mg/dose
<p>7 medicines were found in (50%-75%) of the pharmacies</p>	<ul style="list-style-type: none"> ■ Artemether tablet 50mg ■ Atenolol tablet 50mg ■ Ceftriaxone inj 1g/vial ■ Cephalexin tablet/capsule 250mg ■ Fluconazole tablet/capsule 150mg ■ Losartan tablet 50mg ■ Methylergometrine inj 0.2mg/ml
<p>7 medicines were found in less than 50% of the pharmacies</p>	<ul style="list-style-type: none"> ■ Fluconazole tablet/capsule 200mg ■ Fluoxetine capsule 20mg ■ lamivudine tablet 150mg ■ Lisinopril tablet 10mg ■ Nevirapine tablet 200mg ■ Stavudine tablet 40mg ■ Rifampicin+Isoniazid 150+100mg.
<p>4 medicines were not available in any of the pharmacies</p>	<ul style="list-style-type: none"> ■ Diclofenac tablet 25mg ■ Efavirenz tablet 200mg ■ Indinavir capsule 400mg ■ Zidovudine capsule 100mg

Fig. 3.6 Availability of 45 medicines - Private pharmacies



Generics were widely available in the private pharmacies for all the medicines surveyed in the private pharmacies

The prescription and sale of ARVs in Uganda in the public, private and NGO sector is restricted to facilities that have been accredited by the Ministry of health. These facilities are chosen based on among others the seniority of the human Resource, the lab facilities, the population they serve. In the private sector, particularly the pharmacies, there are still very few that have been accredited to supply ARVs. Table 3.8 below illustrates the percentage availability of ARVs in the private pharmacies.

Table3.8. Percentage availability of ARVs in the Private pharmacies

1st line HAART ARV's	% facilities in stock (number)	
	Innovator Brand	Generic
Stavudine tablet 40mg	0	5% (1)
Nevirapine tablet 200mg	0	5% (1)
Lamivudine tablet 150mg	0	5% (1)
Indinavir capsule 400mg	0	0
Efavirenz tablet 200mg	0	0
Zidovudine capsule 100mg	0	0

- No Innovator antiretroviral products were found
- 3 of the 6 1st line HAART ARV's were found as generics in one private pharmacy

Recommendation

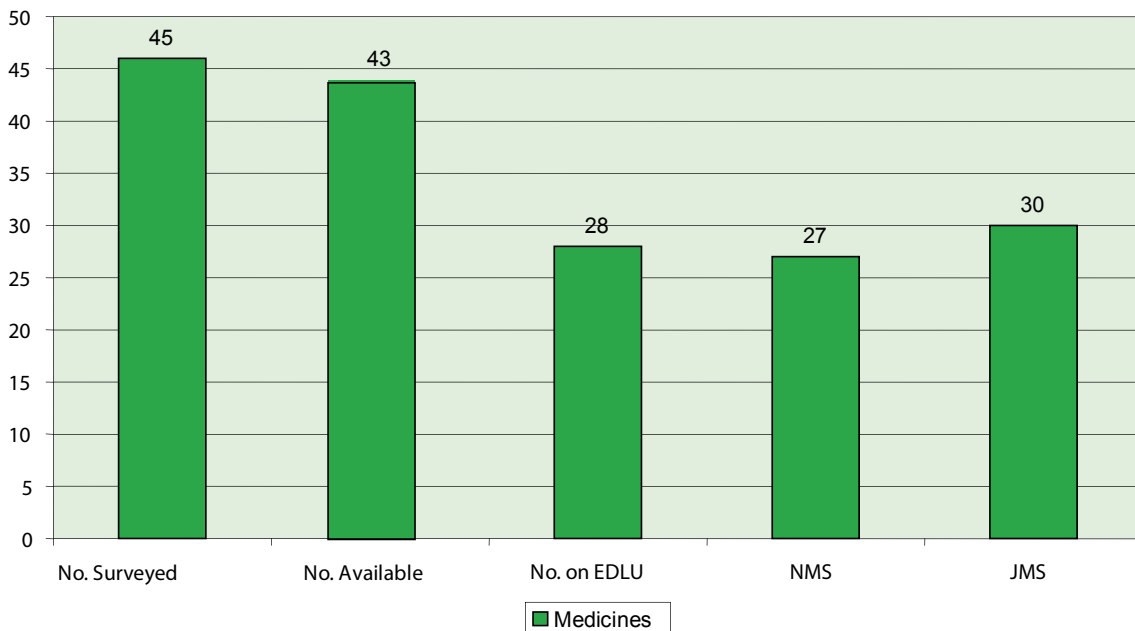
- Expedite accreditation process to include more private pharmacies that supply ARVs are selected and well spread throughout the country.
- Further specific study on the availability and prices of ARVs should be explored

3.2 Public sector availability and procurement prices in Uganda

Overall findings¹⁸

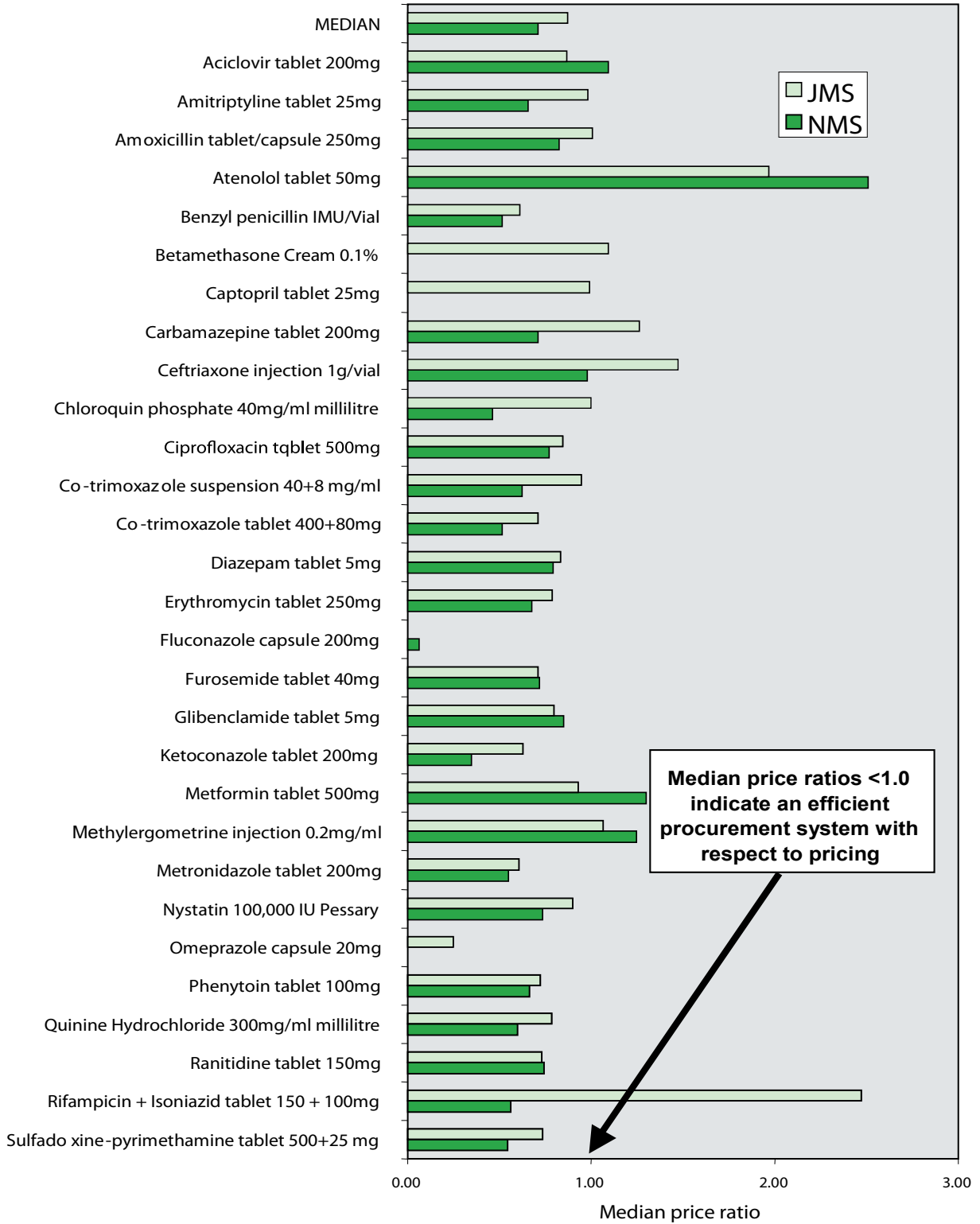
In the public sector, the procurement agency is the National Medical Stores which purchases and supplies medicines on behalf of the ministry of health. National Medical Stores is a semi-autonomous statutory organization established by an act of parliament. Joint Medical stores, is the procurement agency for the NGO sector and it sometimes supplies the public health facilities when the required medicines are not available at NMS. Owing to the role played by the NGO facilities in delivery of health care, the government allocates some funds to these facilities on an annual basis. NMS and JMS run independently of each other

Fig.3. 7 Summary results (Lowest Priced Generics) - Public Sector



Of the 45 medicines on the core and supplementary lists – there were 43 different medicines. Of these 43 medicines, 28 of the medicines were on the Essential Drug list of Uganda. Prices were collected on the 27 medicines found at National Medical Stores (NMS) and 30 medicines found at Joint Medical Stores (JMS).

Fig 3.8. Procurement prices of JMS and NMS compared to international prices



Generally the prices at NMS were less than JMS – however there were some exceptions as shown in table 3.9 below.

Table 3.9 Comparisons of procurement prices with international prices at JMS and NMS

Medicine	JMS	NMS
Median MPR	0.9	0.7
Rifampicin + Isoniazid	2.5	0.6
Albendazole	4.3	
Atenolol	2.0	2.5
Fluconazole		0.1

- All the available medicines at both JMS and NMS were on the EDLU
- Some medicines, despite being on the EDLU were not found at either medical store (diclofenac tablets 25mg, nifedipine retard tablets 20mg)
- No Innovator Brands were found except for salbutamol inhaler and fluconazole 200mg at the national medical stores from the Diflucan Partnerships donation Programme.
- 85% of the medicines at NMS had a MPR less than 1, indicating that they were at less than the international price; 72% for JMS
- The price of rifampicin + isoniazid tablet 150 + 100mg was 440% higher at JMS compared with NMS.
- The median price ratio for albendazole at JMS was very high at 4.3 (JMS – not found at NMS)
- The prices at NMS and JMS are both relatively high for atenolol tablets 50mg - compared to what has been achieved for other medicines at 2.5 and 2.0 respectively

3.3 Medicines availability in the public health facilities

Overall findings: Availability of the EDLU medicines from the core and supplementary lists in the public sector facilities

The median availability of the 28 medicines on the EDLU surveyed was found to be 55% - however some of the medicines are designated as referral hospital or hospital medicines and all levels of the health system were surveyed as shown in table **3.10 below**.

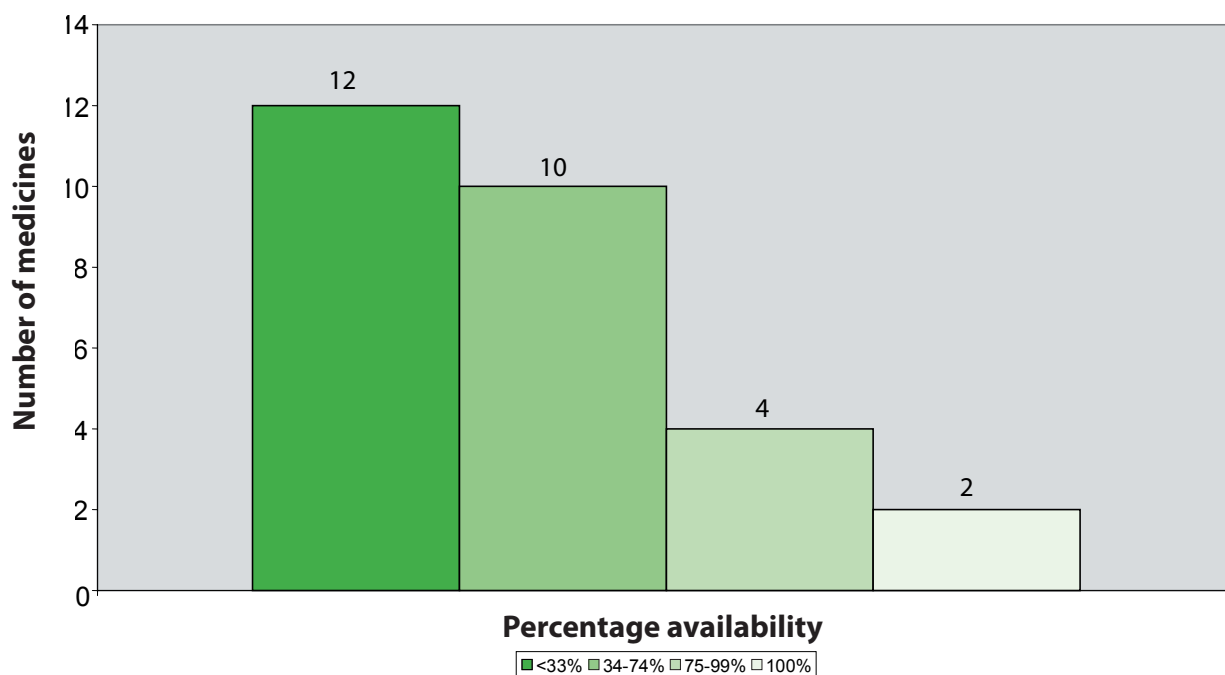
The median price ratio for fluconazole 200mg is for the Innovator product from the Diflucan Partnerships Programme donation is 0.1 – very low; the value being stated by the programme for calculation of the handling fees at NMS

Table 3.10. Essential medicines surveyed and their designated Health Centre levels

Level of Health Centre	Medicines	Number of facilities surveyed
Referral hospital	Ceftriaxone Inj 250mg Fluconazole tablet/capsule 200mg	4
District Hospital	Nifedipine Retard 20mg Omeprazole tablet 20mg Ranitidine tablet 150mg	
Health Centre IV	Aciclovir tablet 200mg Amitriptyline 25mg Artemether tablet 50mg Betamethasone cream 0.1% Carbamazepine tablet 200mg Diclofenac tablet 25mg Glibenclamide tablet 5mg Metformin tablet 500mg Rifampicin+Isoniazid tab/capsule 150mg+100mg Salbutamol inhaler 100µg/metred dose	8
Health Centre III	Ciprofloxacin tablet 500mg Ketoconazole tablet 200mg Methylergometrine Inj 200µg/ml Phenytoin tablet /capsule 100mg Quinine Inj 300mg/ml	
Health Centre II	Amoxicillin tablet/capsule 250mg Benzyl penicillin Inj 1MU Chloroquin inj 40mgbase/ml Co-trimoxazole syrup 240mg/5ml Co-trimoxazole tablet 480mg Erythromycin tablet 250mg Metronidazole tablet 200mg	
Health Centre I	Sulfadoxine+Pyrimethamine tablet 500mg+25mg	

In Uganda the procurement of medicines in the public sector is mainly based on the EDLU and is done by the NMS. The ministry of health has introduced a pull system where the facilities are supplied with medicines requested. The Figure 3.9 below shows the percentage availability of essential medicines in the public health facilities.

Fig. 3.9. Percentage availability of medicines on the EDLU- Public health facilities



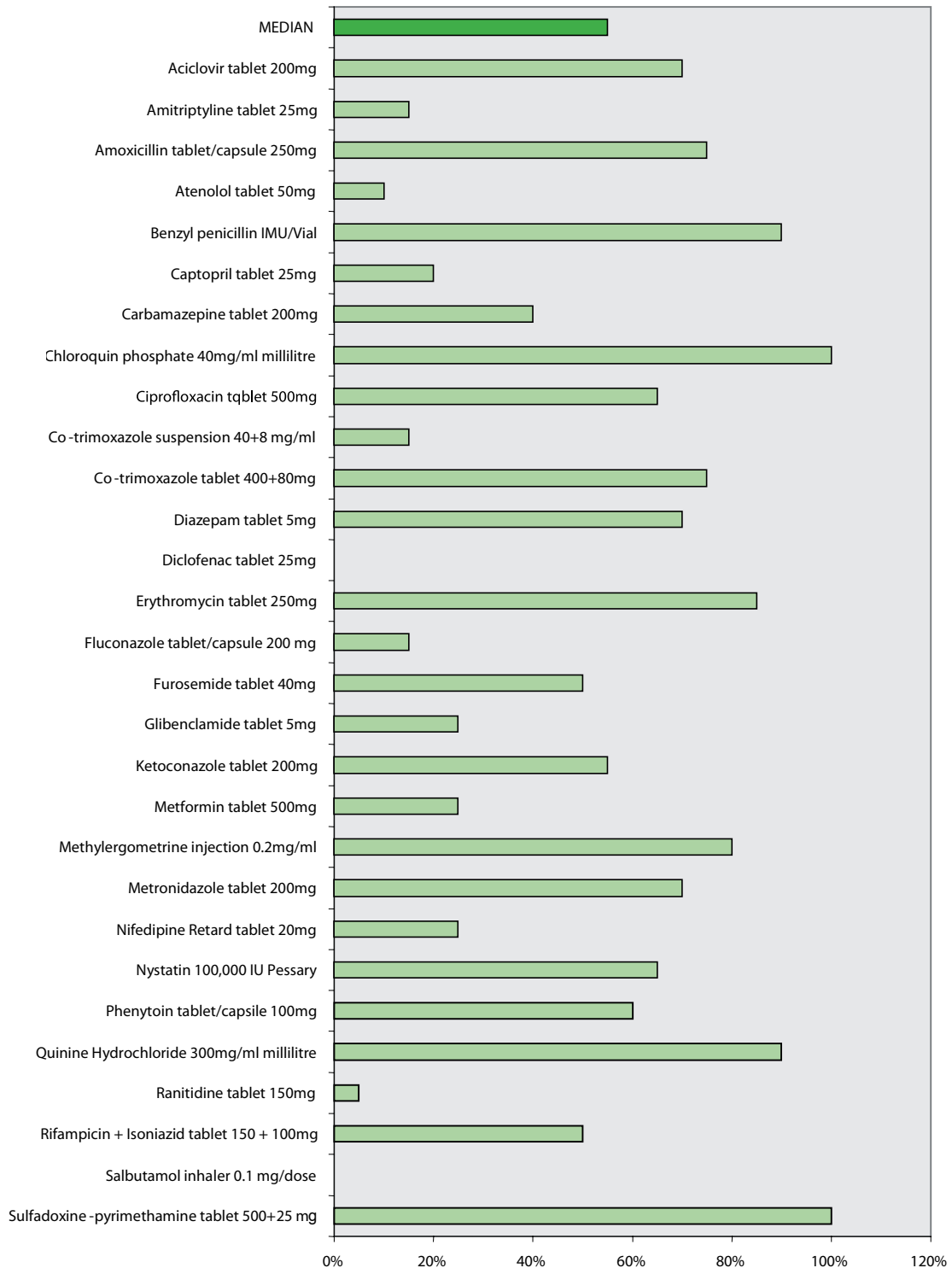
Percentage availability of medicines on the EDLU-Public health facilities

- Salbutamol inhaler, an essential medicine in the treatment of asthma, was available at the NMS and not available at facility level.
- 12 medicines were found in less than 33% of the public health facilities
- 10 medicines were found in 34-74% of the public health facilities
- 4 Medicines were found in 75-99% of the public health facilities
- Sulfadoxine/pyrimethamine and chloroquine injection were found in all the public health facilities.

Recommendations

- Strengthen the NMS management information system to ensure efficient information flow about the available medicines, to the recipient facilities
- Strengthen the demand driven ordering system in the public sector through training and sensitisation of hospital pharmacists and the officers responsible for ordering of medicines at lower public health facilities.
- Investigate why some essential medicines such as salbutamol inhaler are found at the NMS but not available at the lower level health facilities
- Design and implement a pooled procurement system for the two procurement agencies (JMS and NMS) so as to enjoy the advantages of economies of scale. Particular emphasis should be put on the medicines whose international reference prices are greater than one. This will improve the availability of essential medicines at NMS.

Fig. 3.10 Availability of EDL Medicines at all levels-Public Sector



Recommendation

- The Ministry of health should reinforce the training of procurement officers in the public health facilities to improve the medicines needs assessment for their regions.

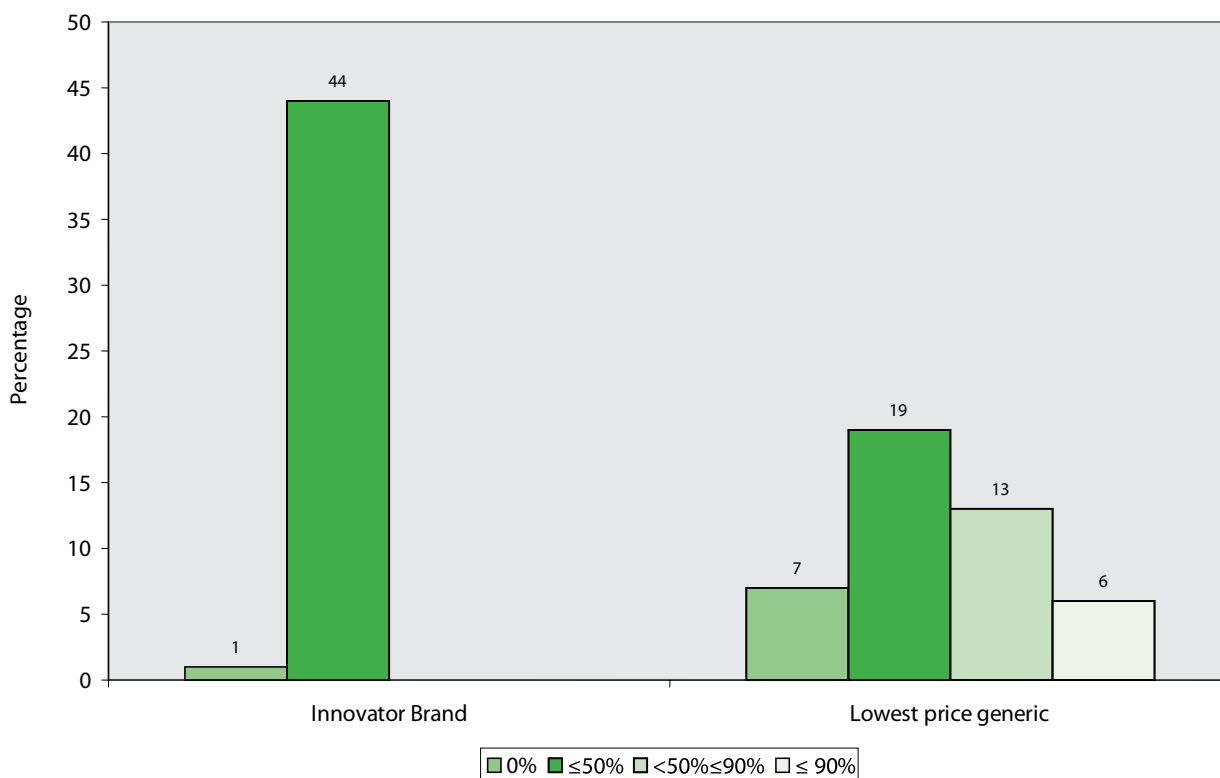
3.4 Availability and prices of medicines in the NGO sector

Table 3.11 illustrates the percentage availability of individual medicines for the facilities that were surveyed in the NGO sector.

Table 3.11. Percentage availability of medicines in the NGO Sector

1 Innovator brand was available in less than 50% of the facilities surveyed	<ul style="list-style-type: none"> ■ Artemether tab 50mg
6 generics were found in 90% and of the facilities surveyed	<ul style="list-style-type: none"> ■ Benzylpenicillin inj 1MU/vial ■ Ciprofloxacin tab 500mg ■ Co-trimoxazole tab 400+80mg ■ Erythromycin cap/tab 250mg ■ Metronidazole tab 200mg ■ Quinine hydrochloride inj 300mg/ml
13 generics were found in more than 50% but less than 90% of the facilities surveyed	<ul style="list-style-type: none"> ■ Aciclovir tab 200mg ■ Amitriptyline tab 25mg ■ Amoxicillin tab/cap 250mg ■ Chloroquin Inj.40mg base/ml ■ Diazepam tab 5mg ■ Furosemide tab 40mg ■ Glibenclamide tab 5mg ■ Ketoconazole tab 200mg ■ Methylethergometrine inj 0.2mg/ml ■ Nifedipine retard 20mg ■ Nystatin pessaries 100,000iu ■ Phenytoin tab 100mg ■ Sulfadoxine-Pyrimethamine tab 500+25mg,
19 generics were found in less than 50% of the facilities surveyed	<ul style="list-style-type: none"> ■ Albendazole tab 200mg ■ Artemether tab 50mg ■ Atenolol tab 50mg ■ Betamethasone Cream 1% w/v ■ Captopril tab 25mg ■ Carbamazepine tab 200mg ■ Ceftriaxone inj 250mg ■ Cephalexin tab 250mg ■ Co-trimoxazole suspension 40+8mg/ml ■ Efavirenz tab 200mg ■ Lamivudine tab 150mg ■ Lisinopril tab 10mg ■ Losartan tab 50mg ■ Metformin tab 500mg ■ Nevirapine tab 200mg ■ Omeprazole tab 20mg ■ Ranitidine tab 150mg ■ Salbutamol inhaler 200does ■ Stavudine tab 40mg,
7 generics were not found in any of the facilities surveyed	<ul style="list-style-type: none"> ■ Diclofenac tab 25mg ■ Fluconazole cap 200mg ■ Fluconazole cap 150mg ■ Fluoxetine caps 20mg ■ Indinavir caps 400mg ■ Rifampicin/Isoniazid 150 100mg ■ Zidovudine caps 100mg

Fig 3.11 Percentage availability in the NGO sector-45medicines



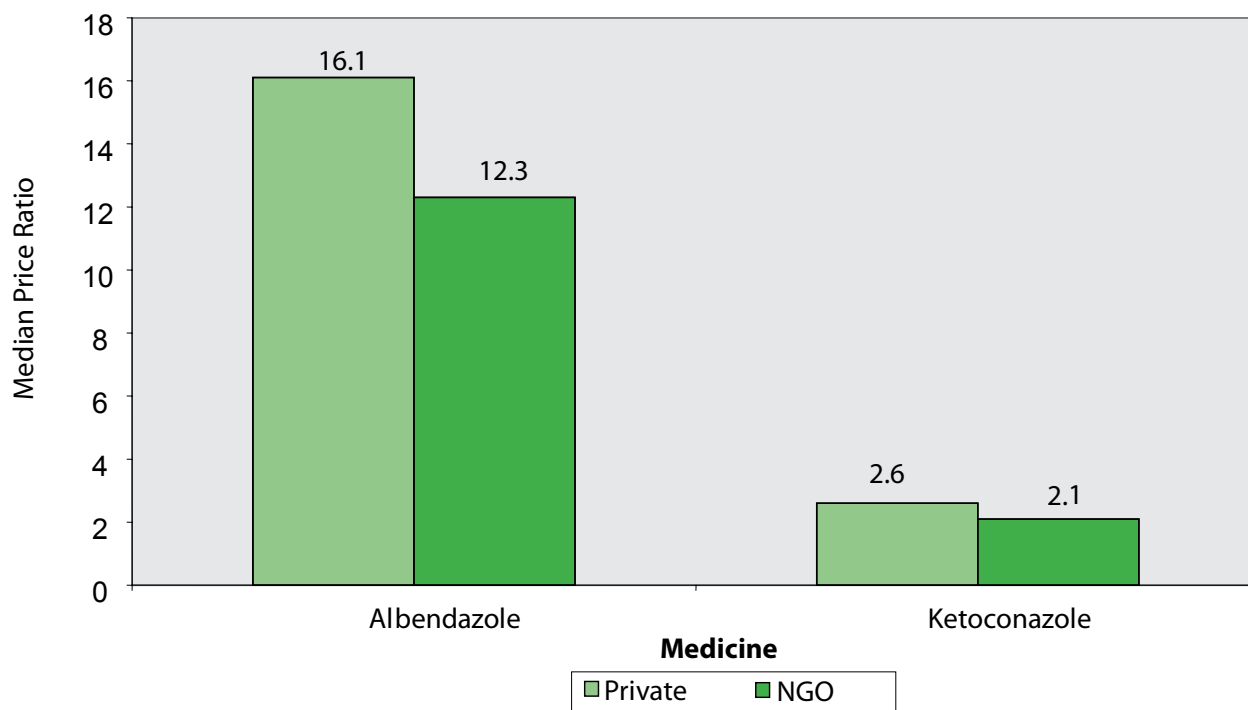
- Generics were found to be more widely available than the corresponding Innovator Brands in the NGO sector
- Only artemether was found in the Innovator Brand form in this sector

Table 3.12: Comparison of patient prices with international prices between individual products with huge differences in Prices in 2 Sectors (private and NGO sector)²³

Medicine	Type	Private	NGO's
Albendazole	Innovator Brand	118.0	
	Lowest Price Generic Equiv.	16.1	12.3
Ketoconazole	Innovator Brand	8.4	
	Lowest price generic equiv.	2.6	2.1

Medicines in the public health facilities are free, the procurement prices are only available which cannot be compared with the patient prices in the private pharmacies and NGOs.

Fig 3.12 Comparison of the patient prices with international reference prices for 2 medicines in the Private and NGO sector



Generic name	Type	Product name	Private	NGO's
Albendazole 200mg	Innovator Brand	Zentel	2750	NA
	Lowest Price generic equivalent		375	287.5
Ketoconazole 200mg	Innovator Brand	Nizoral	1600	NA
	Lowest Price generic equivalent		500	400

For the two medicines the generic forms in the private sector were more expensive than in the NGO sector.

Table 3.11 Affordability of medicines in the Private pharmacies

Treatment: Adults	Type	Private pharmacies	
		Median Price (Ushs)	Days wages
Diabetes Glibenclamide 5mg x2 30days	Innovator Brand		
	Most Sold generic	3900	1.6
	Lowest price generic equivalent	3000	1.2
Asthma Salbutamol Inhaler 200 doses	Innovator Brand	14000	5.6
	Most Sold generic	5000	2.0
	Lowest price generic equivalent	5000	2.0
ARI (children) Co-trimoxazole Sus- pension 5mlx2 7days	Innovator Brand		
	Most Sold generic	1108	0.4
	Lowest price generic equivalent	933	0.4
Peptic Ulcer Ranitidine 150mg x2 30days	Innovator Brand	90000	36.0
	Most Sold generic	6000	2.4
	Lowest price generic equivalent	7500	3
Acute Respiratory Infection Amoxi- cillin 250mg x 3 7days	Innovator Brand	10500	4.2
	Most Sold generic	1575	0.6
	Lowest price generic equivalent	1050	0.4
Malaria Sulphadoxine/ Pyrimethamine 525mg (3x1day)	Innovator Brand	2000	0.8
	Most Sold generic	800	0.3
	Lowest price generic equivalent	500	0.2

3.5 Affordability in Private pharmacies

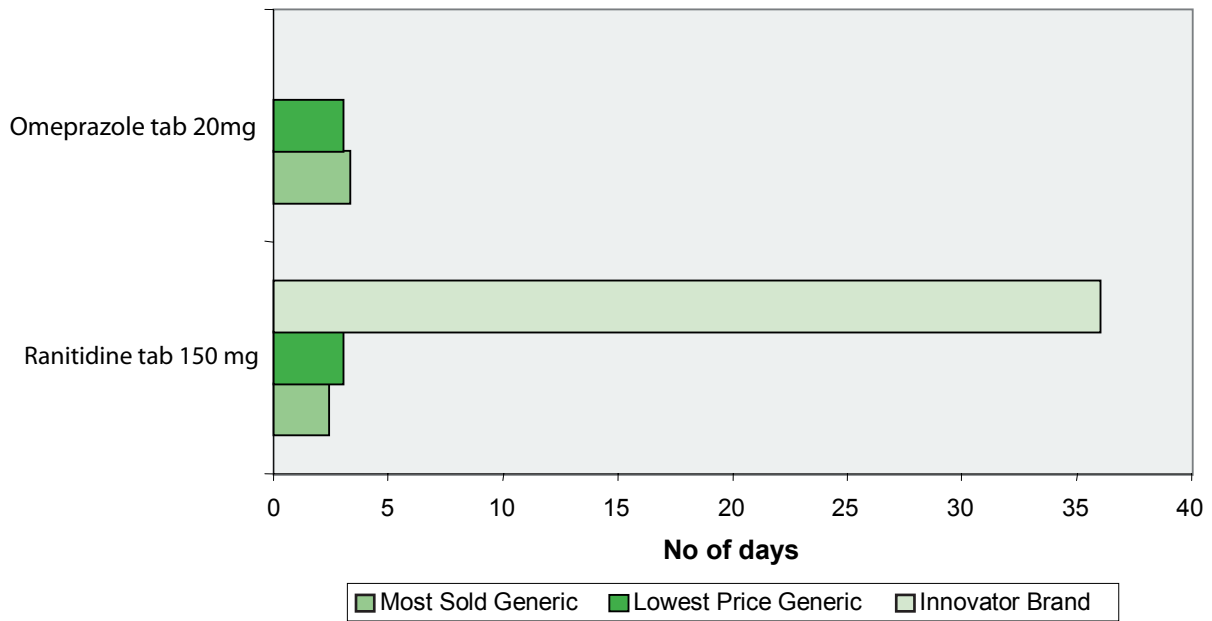
Using the methodology of comparing the cost of treatment with a person's income, the affordability component of the survey results was extracted. The daily wage of the lowest paid government worker was used along with pricing data for medicines for a selection of common illnesses and the calculation is reported as the number of days the worker would have to work in order to afford a course of treatment for those conditions.

In Uganda, the lowest monthly government salary was identified as UShs 75,000/=, that is UShs 2,500 or \$1.31 per day . According to the national poverty estimates 38% of the population live below one dollar a day. Affordability of treatment in the Private pharmacies for diabetes, asthma and Malaria is shown in **Table 3.11 above**.

- For a chronic disease like asthma, it would cost a patient 5.6 days wages to buy an Innovator Brand salbutamol inhaler in the Private pharmacies compared to 2.0 days wage for the lowest price generic equivalent.
- For acute illnesses such as pneumonia it would take 4 days wages to buy a weeks' treatment course of Innovator Brand amoxicillin and 0.6 days wages to buy a generic equivalent.
- For common illnesses such as Malaria it would take 0.8days wages to buy a treatment course of Innovator Brand, Sulfadoxine/ Pyrimethamine in the private pharmacies compared to 0.2 days wages to buy a generic equivalent
- For a given family where there is an asthmatic child with a respiratory infection on 1 Salbutamol inhaler together with 70ml co-trimoxazole suspension, an adult with diabetes on 60 glibenclamide tablets 5mg and another adult with peptic ulcer is on 60 ranitidine tablets 150mg, it will take a total of 6.4 days wages to purchase generics compared to 41.2 days wages to purchase only 2 Innovator Brands; Salbutamol and Ranitidine.

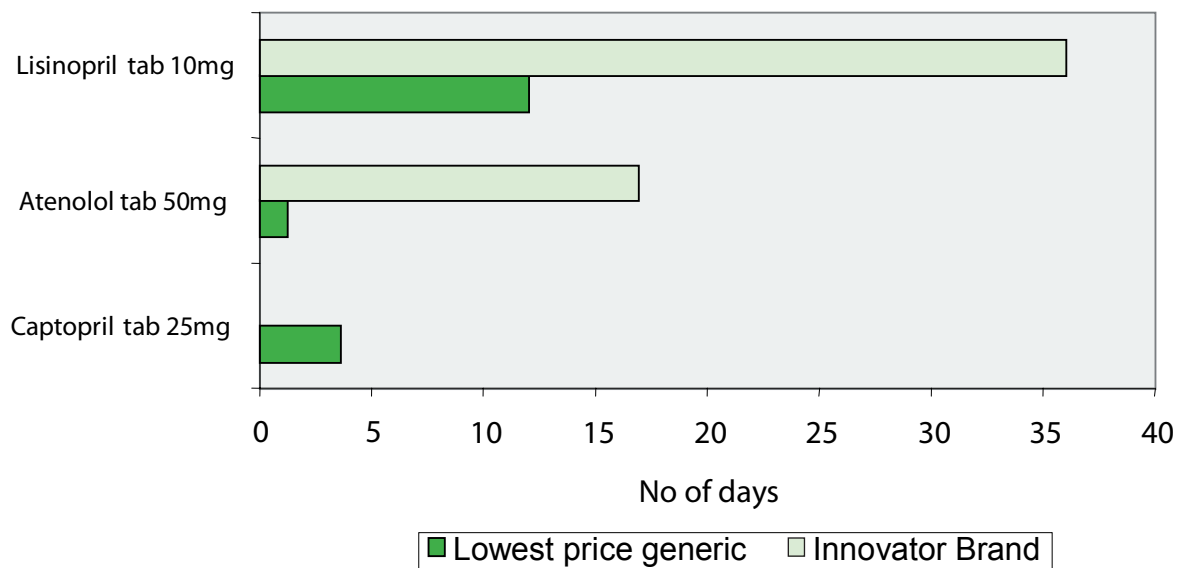
²¹ On the day of data collection the exchange rate was 1\$=Ushs 1900.

Fig 3.13 Days wages needed for a monthly treatment of peptic ulcers



- It takes 36 days wages to purchase Innovator Brand Ranitidine compared to 2.4 days wages to buy a generic equivalent and 3.3 days wages to buy an alternative treatment of generic omeprazole

Fig 3.14: Days wages needed for a monthly treatment of Hypertension



- For a monthly treatment of Hypertension using a B-blocker such as atenolol 50mg, it takes 17days wages to purchase the Innovator Brand and 1days wage to buy a generic equivalent.
- When using alternative ACE inhibitors such as lisinopril 10mg, it takes 36 days to purchase an Innovator Brand and 12 days to buy a generic equivalent respectively. When using another less expensive ACE inhibitor, captopril 25mg it takes 4 days to purchase a generic
- It generally would take considerably more days wages to buy the Innovator Branded products for treatment of common infections than the generic equivalents.

Recommendation

- Design strategies to promote the use of generics, which are more affordable than Innovator Brands.
- Ensure constant availability of generic medicines for chronic infections at the NMS and JMS, for them to be accessed by private pharmacies at cheaper prices.

3.6 Sub-Regional price comparisons

The pricing surveys were undertaken in 7 more countries i.e. Ethiopia, Ghana, Kenya, Nigeria, South Africa, Tanzania and Zimbabwe. In all these countries, procurement in the public sector was analyzed. In order to carry out a meaningful inter-country comparison only prices of medicines on the core list were compared. The table 3.14 below shows the variations in procurement prices within each country but also at the East Africa sub-regional level.

Table 3.15 Number of times more expensive: Procurement prices in the public sector compared to international prices within the East Africa region.

	8 Country median	Kenya (n=14)	Tanzania (n=20)	Uganda (n=14)
75th percentile	1.16	0.69	0.85	0.85
25th percentile	0.65	0.36	0.58	0.67
Median	0.86	0.55	0.67	0.78

In the 8 countries where the surveys were undertaken in Africa, the median procurement prices were also lower than the median international reference price for the medicines surveyed. In the three East Africa countries, procurement in the public sector is mainly done by the national procurement agency. Of the 30 core medicines that were surveyed internationally, Tanzania had 20 medicines available at the procurement agency while Kenya and Uganda had 14 medicines. Generally the procurement prices were found to be in the same range and for all the three countries and lower than the median prices of the 8 countries. Uganda had the highest prices with median procurement prices 0.78 times followed by Tanzania which was 0.67 times and Kenya with a median procurement price of 0.55 times the international reference prices.

Fig.3.15 Comparison of public procurement prices in the East African sub-region

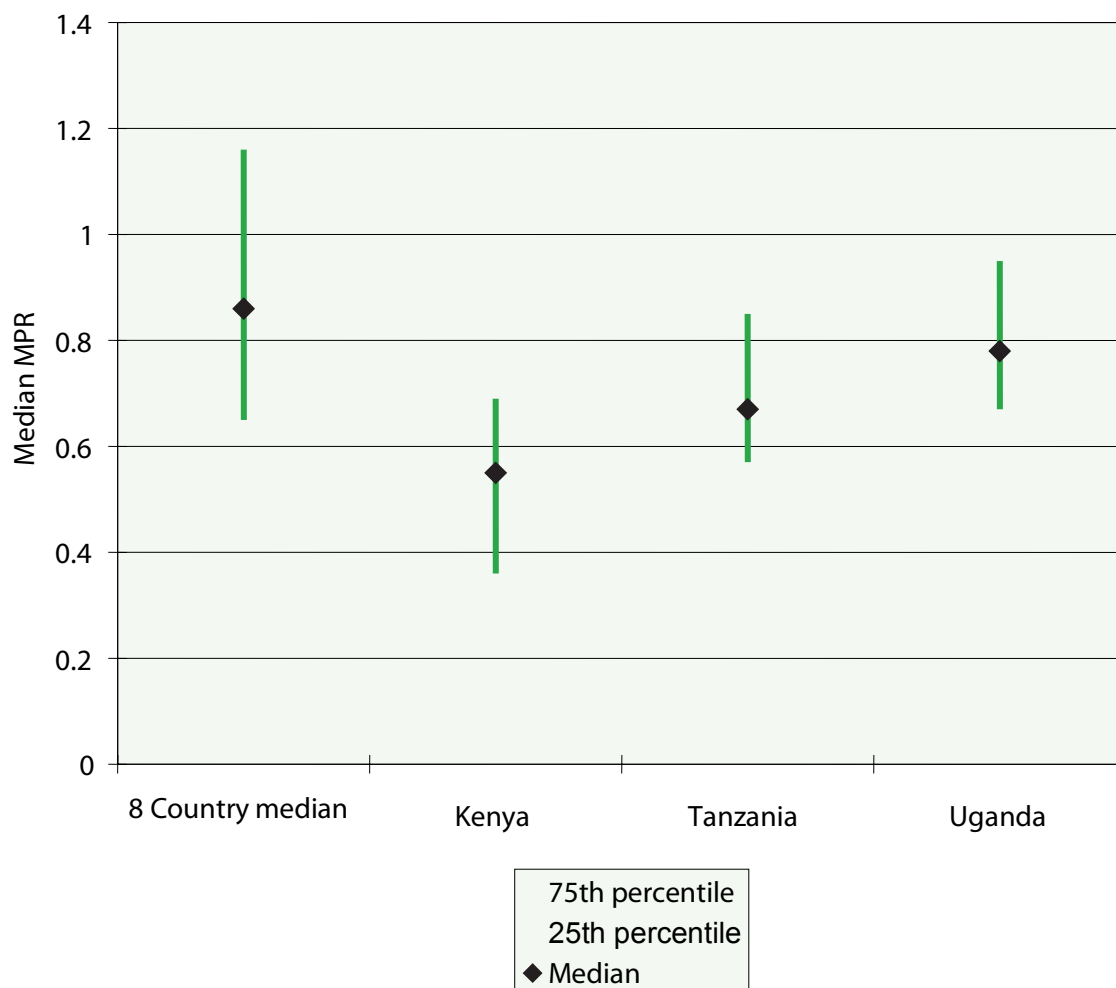
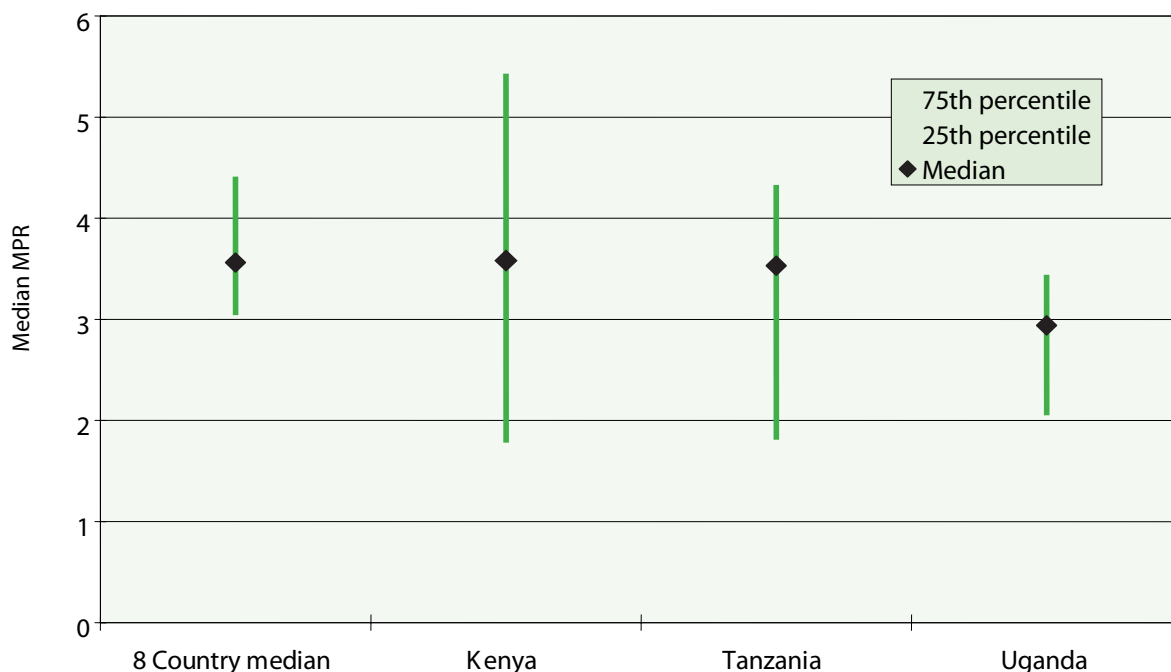


Table 3.16 Number of times more expensive: Patient prices for medicines at private pharmacies for lowest price generics compared to international prices within East Africa sub-region

	8 Country median	Kenya (n=27)	Tanzania (n=21)	Uganda (n=21)
75th percentile	4.41	5.43	4.33	3.44
25th percentile	3.04	1.78	1.81	2.05
Median	3.56	3.58	3.53	2.94

The fig. 3.15 shows a comparison of prices of the lowest price generics in the 3 East Africa Countries in relation to the international prices.

Fig.3.16. Comparison of patient prices of lowest price generic in the private pharmacies



For the lowest price generics in the private pharmacies, Kenya had the highest number of generics with 27 medicines available while Uganda and Tanzania had 21 medicines. Kenya also had the highest prices with a median of 3.58 times the international reference prices followed by Tanzania with a median price of 3.53 times and Uganda with a median price of 2.94 times the international reference prices. Of the three countries Kenya had the widest variation in prices with 50% of the medicines surveyed being sold between 1.78-5.43 times the international reference prices.

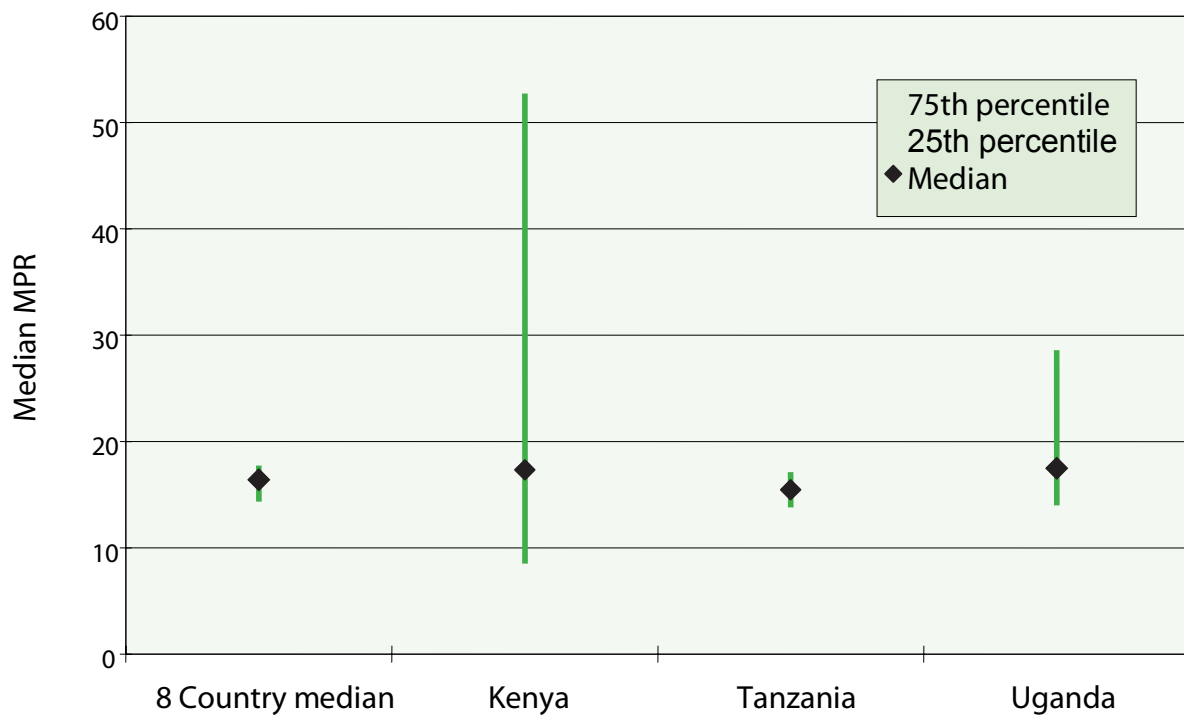
The table 3.16 below shows the prices of the Innovator Brands compared to the international reference prices in the East Africa region.

Table 3.17 Number of times more expensive: Patient prices for medicines in private pharmacies for Innovator Brands compared to international prices within the East Africa sub-region

	8 Country median	Kenya (n=23)	Tanzania (n=2)	Uganda (n=6)
75th percentile	17.73	52.73	17.12	28.59
25th percentile	14.35	8.51	13.79	13.99
Median	16.39	17.33	15.45	17.48

The fig. 3.16 shows a comparison of prices of Innovator Brands in the 3 East Africa Countries in relation to the international prices.

Fig.3.17. Comparison of patient prices of Innovator Brands in the private pharmacies with international prices in East Africa sub-region



Of the core medicines surveyed internationally, Uganda and Tanzania had the lowest number of Innovator Brands available 2 and 6 respectively. Kenya had 24 Innovator Brands in the private pharmacies. Kenya had the highest prices for Innovator Brands with a median of 17.33 times the international reference prices within the private sector. Uganda followed with a median of 17.48 times the international price. Tanzania had the lowest prices with a median of 15.45 times the international price. Of the three countries, Kenya had the widest variation in the prices 50% of the medicines being sold between 8.51-52.73 times the international prices.

Recommendations.

- Conducting regular surveys at the sub-regional levels
- Regular sharing and publishing of information on medicine prices within the East Africa sub-region.
- Explore possibilities of bulk or pooled procurement for the procurement agencies in the three

3.7 Price components and cumulative mark-up

The medicine price components were measured both in the private and public sector to study the impact of clearing, handling charges and mark-ups on the price the patient pays. The table below represents the price components of an imported IB, imported generic and a locally produced generic (P+S).

Table 3.18: Price Components and cumulative mark-up for one imported and one locally produced Sulfadoxine/Pyrimethamine (3 tablets)

Component	Imported Innovator Brand-Private pharmacies		Imported generic Private pharmacies		Locally produced generic equivalent, Private pharmacies		Imported Generic-Public health facilities	
	%	UGShs	%	UGShs	%	UGShs	%	UGShs
Import Price (FOB)		320.3		169.5		144		90.3
NDA Verification fee	0.8%	323	0.8%	170.85			0.8%	91.02
Insurance and Freight	3%	333	3%	183.93			2%	92.84
Clearing Charges	3%	343.33	2%	187.93			0.7%	93.49
Importer mark-up	23%	422.20	6%	198.87			23.3%	115.3
Whole sale mark-up	2%	430.75	0%	198.87	4.2%	150		NA ₂₂
Retail Mark-up	364.3%	1999.95	402.8%	999.89	233.3%	500		NA
Sales price		2000		1000		500		NA
Total add-ons	396.1%	1679.7	414.6%	830.5	237.5%	356	26.8%	24.97

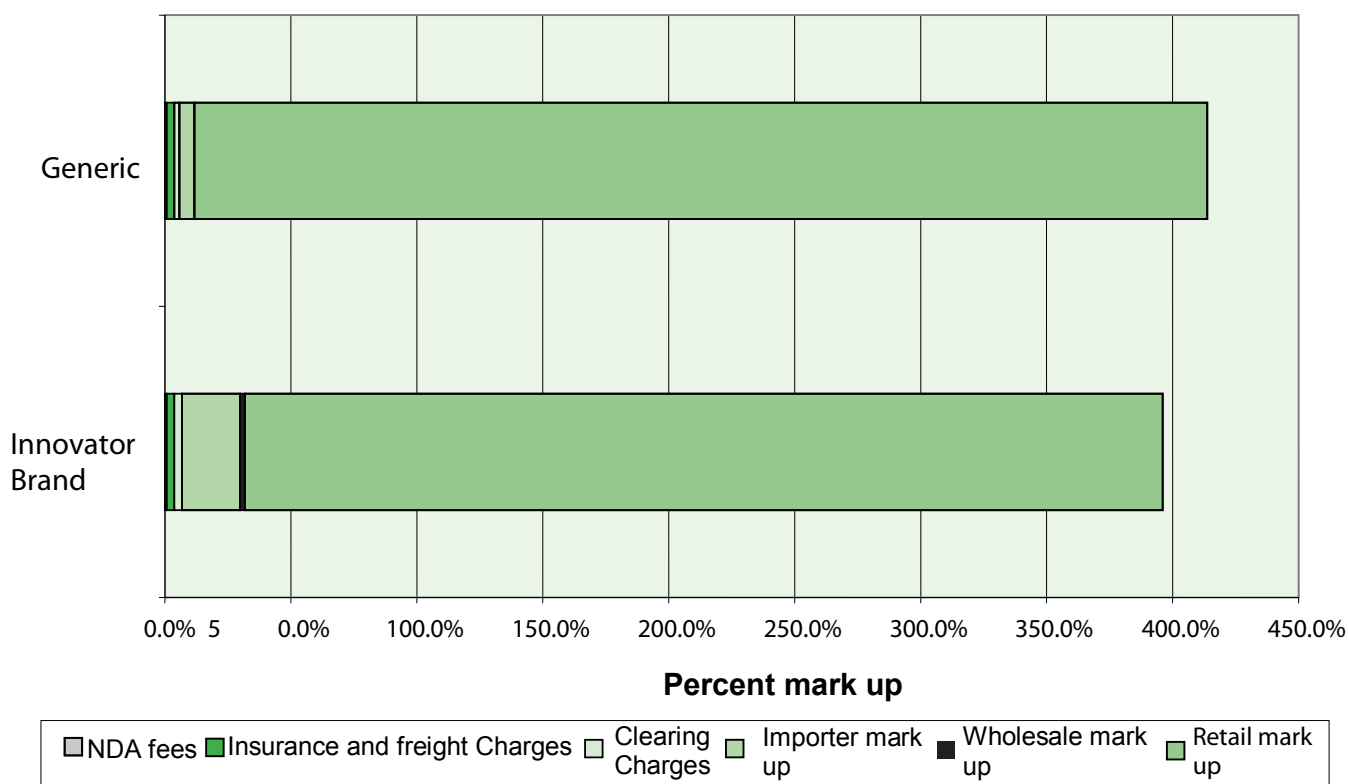
In Uganda the economy is liberalized and therefore mark ups vary from product to product. The findings are based on interviews with the respective country managers of the pharmaceutical wholesalers and distributors. In some instances the importer is at the same time the wholesaler so there is no additional mark up after importation.

- In the public sector, the mark-up added to the tender price was 23.3% and an equivalent of 3.5% was added to cater for the insurance and freight, clearing fees, and National Drug Authority verification fees.
- In the Private pharmacies in Uganda, the mark ups vary, they constitute the clearing and handling charges (on average about 3%), while the importer mark up varies from 10-40%.
- In most cases the retailer mark-up is the highest, especially for large pack sizes and it varies from 36-720%.

²² Medicines are free in the public health facilities; there are no add-ons after sale from NMS.

- In the Private pharmacies prices for both the generic and Innovator Brand increased 6 times. This is a common observation in other surveys, because Innovator Brands are expensive, the prices of generics are also increased highly to ensure competition in prices

Fig 3.18. Proportion of mark-ups for imported Innovator Brand and generic Sulfadoxine/Pyrimethamine (25 + 500mg)



Recommendation

- Develop monitoring mechanisms of the level of mark ups for the essential medicines within the distributions chain
- Establish a form of reference pricing for medicines in Uganda to prevent excessive prices e.g. determine prices compared to a basket of countries of similar wealth distribution and health coverage. Such prices should then be reference and distributed widely by all stakeholders including Civil Society Organizations.
- Design and implement interventions to monitor the high level of retail mark-ups
- Design and implement strategies for NMS and JMS to negotiate directly with manufacturers so as to reduce cumulative mark ups by importers and retailers



4.0 Conclusions And Recommendations

Access to Medicines

For the medicines surveyed, in the Private pharmacies only 28% and 84.7% of the Innovator forms and generics respectively were available in at least 4 pharmacies surveyed in each region.

In the public sector, the median availability of medicines surveyed, which are on the Ugandan EDLU, was 55% with 10 of the 11 medicines on the EDLU having a percentage availability of 75-100%. However some of the medicines are designated as referral hospital or hospital medicines and all levels of the health system were surveyed including HCII, HCIII, HCIV, Regional referral hospitals and Mulago National referral hospital. This may be partly due to the procurement system being highly influenced by the EDLU.

In the Private pharmacies, the ARVs were available in only one pharmacy possibly due to accreditation policy, which is restricted to a few private pharmacies with quality facilities.

To improve access the following measures are recommended:

- A medicines pricing policy needs to be developed and implemented in order to achieve a greater level of transparency, uniformity and predictability in the pricing of medicines in Uganda. Such a policy will be of great assistance in the determination and effective implementation of pro-poor interventions aimed at increasing access to essential medicines
- Strengthen the demand driven ordering system in the public sector through training and sensitisation of hospital pharmacists so as to increase the availability of medicines in the public health facilities
- Strengthen the NMS management information system to ensure efficient information flow about the available medicines, to the recipient facilities
- Reinforce training of procurement officers of various health facilities in medicine quantification.
- Conduct a specific study on the availability and prices of ARVs in the three sectors.
- Expedite accreditation mechanism thereby ensuring that more private pharmacies that supply ARVs are selected and well spread throughout the country.

Procurement/ Purchasing

The procurement prices for the medicines found at the two procurement centres were 0.81 times the international prices. In other words the two procurement agencies JMS and NMS purchased medicines at a cost 19% times lower than the international reference prices. Though this is an indicator of better prices, some individual medicines such as albendazole, acyclovir, atenolol, metformin had very high MPR. The following are recommended to improve the procurement system:

- Strengthen the NMS management information system to ensure efficient information flow about the available medicines, to the recipient facilities. This will ensure that the public health facilities are constantly aware of the medicines that are available at the NMS and therefore the availability at the public health facility level.
- Strengthen the demand driven ordering system in the public sector through training and sensitisation of hospital pharmacists and the officers responsible for ordering of medicines at lower public health facilities.
- Investigate why some essential medicines such as salbutamol inhaler are found at the NMS but not available at the lower level facilities
- Design and implement a pooled procurement system for the two procurement agencies (JMS and NMS) so as to enjoy the advantages of economies of scale. Particular emphasis should be put on the medicines whose Median Price Ratios are greater than one. This will improve the availability of essential medicines at NMS.

Distribution system

The marks ups were found to vary from medicine to medicine and from sector to sector. The wholesale and retail mark ups were the highest in the Private pharmacies. The medicines surveyed were mostly out of reach for the lowest income earners in the Private pharmacies than any other sector. The numbers of days' wages to treat infections with Innovator products were 7-12 times more than using generics. The contributory effect of the retail mark ups on the sales price of all medicines prices was the highest.

Generic competition

The generic competition was found to have a positive impact on the reduction of prices. The products which had a few varieties of generics (less than 5) registered were highly priced compared to international reference prices. While there is no information on the use of generics, in the three sectors surveyed availability of generics far exceeded that of Innovator Brands suggesting an acceptance and use of generics. These are the recommendations

These are the recommendations

- Develop monitoring mechanisms of the level of mark ups for the essential medicines within the distributions chain
- Establish a form of reference pricing for medicines in Uganda to prevent excessive prices e.g. determine prices compared to a basket of countries of similar wealth distribution and health coverage. Such prices should then be reference and distributed widely
- Design and implement interventions to monitor the high level of retail mark-ups
- Design and implement strategies for NMS and JMS to negotiate directly with manufacturers so as to reduce the cumulative mark ups made by importers and retailers.

- Develop and implement clear mechanisms for promoting of Generic acceptance by health professionals. Such mechanisms include the enforcement of use of National Standard Treatment Guidelines by the Private sector.
- Promote prescribing and use of medicines by generic name in public and private health sectors through the development of a formal generic prescribing and substitution policy enshrined in law.
- Design strategies to promote the acceptance of quality generics by consumers, which are more affordable than Innovator Brands.
- Ensure the constant availability of generic medicines for chronic infections at the NMS and JMS so as to be accessed by private pharmacies at cheaper price
- Improve the efficiency and strengthen the National Drug Authority to ensure fast track registration and approval of more varieties of quality generics so as to encourage generic competition.
- Design strategies which encourage lowering of prices of medicines where they have been found to be high compared to international prices by exploring alternative sources of medicines such as local production.

Affordability

In the baseline survey conducted in 2002, it was found that 35% of the facilities were found to be dispensing over 95% of the medicines prescribed and just over half of the facilities was dispensing more than 75% of the medicines prescribed. However, 1 in 10 of the facilities was dispensing less than 50% of the medicines prescribed. These patients, who do not fill their prescriptions in the public sector, resort to private pharmacies for the unavailable medicines.

The key medicines were found to be unaffordable for the poor in the Private pharmacies. This was especially worse for medicines used to treat chronic infections such as; asthma, hypertension and peptic ulcers and diabetes. There was a wide variation in the number of days wages for treatment of infections between Innovator Brands and generics (3-12 times more). The following are recommended

- The Ministry of Health should promote the use of generics, which are more affordable than Innovator Brands.
- Ensuring the constant availability of generic medicines for chronic infections at the NMS and JMS so as to be accessed by private pharmacies at cheaper prices.

Annex

Annex 1: Core and Supplementary List of medicines

Generic name	Dose	Dosage form	Medicine category
1. Aciclovir	200 mg	tablet	Antiviral
2. Amitriptyline	25 mg	tablet	Antidepressant
3. Amoxicillin	250 mg	capsule/tablet	Antibacterial
4. Atenolol	50 mg	tablet	Antihypertensive
5. Captopril	25 mg	tablet	Antihypertensive
6. Carbamazepine	200 mg	tablet	Antiepileptic
7. Ceftriaxone	1 g powder	for injection	Antibacterial
8. Ciprofloxacin	500 mg	tablet	Antibacterial
9. Co-trimoxazole	(8 + 40) mg/mL	paediatric suspension	Antibacterial
10. Diazepam	5 mg	tablet	Anxiolytic
11. Diclofenac	25 mg	tablet	Antiinflammatory
12. Fluconazole	200 mg	tablet/capsule	Antifungal
13. Fluoxetine	20 mg	tablet/capsule	Antidepressant
14. Glibenclamide	5 mg	tablet	Antidiabetic
15. Indinavir	400 mg	capsule	Antiviral
16. Losartan	50 mg	tablet	Antihypertensive
17. Metformin	500 mg	tablet	Antidiabetic
18. Nevirapine	200 mg	tablet	Antiviral
19. Nifedipine retard	20 mg retard	tablet	Antihypertensive
20. Omeprazole	20 mg	capsule	Antacid
21. Phenytoin	100 mg	tablet	Antiepileptic
22. Pyrimethamine with Sulfadoxine	(500+25) mg	tablet	Antimalarial
23. Ranitidine	150 mg	tablet	Antacid
24. Salbutamol	0.1 mg per dose	inhaler	Antiasthmatic
25. Zidovudine	100 mg	capsule	Antiviral

Supplementary List of Medicine

Name	Dose	Dosage form	Medicine category
1. Albendazole	200mg	tablet	Anthelmintic
2. Artemether	50mg	tablet	Antimalarial
3. Benzylpenicillin	1MU	injection	Antibacterial
4. Betamethasone	1%w/v	ointment	Antiinflammatory
5. Cephalexin	250mg	tablet	Antibacterial
6. Chloroquin Phosphate	40mg/5ml	injection	Antimalarial
7. Co-trimoxazole	400+80mg	tablet	Antibacterial
8. Efavirenz	200mg	tablet	Antiviral
9. Erythromycin	250mg	capsule/tablet	Antibacterial
10. Fluconazole-150	150mg	capsule/tablet	Antifungal
11. Furosemide	40mg	tablet	Antihypertensive
12. Ketoconazole	200mg	tablet	Antifungal
13. Lamivudine	150mg	tablet	Antiviral
14. Lisinopril	10mg	tablet	Antihypertensive
15. Methylergometrine	200µg/ml	injection	Oxytocic
16. Metronidazole	200mg	tablet	Antibacterial
17. Nystatin	100000iu	pessary	Antifungal
18. Quinine	300mg/5ml	injection	Antimalarial
19. Rifampicin+ Isoniazid	150+100mg	tablet	Antituberculous
20. Stavudine	40mg	tablet	Antiviral

Annex 2: Medicine data collection form

Generic name, dosage form, strength	Brand name (s)	Manufacturer	Available tick for yes	Pack size re-comm-ended	Pack size found	Price of pack found	Unit price (4 decimal places)	Comments
Aciclovir	Zovirax	GSK		25			/tab	
Aciclovir	Cyclovax	Remedica		25			/tab	
Lowest price generic equivalent				25			/tab	
Albendazole	Zentel	GSK		2			/tab	
Albendazole	Zepar	Shaigan Pharm		2			/tab	
Lowest price generic equivalent				2			/tab	
Amitriptyline	Tryptizol	MSD		100			/tab	
Amitriptyline	Amitriptyline	Cosmos		100			/tab	
Lowest price generic equivalent				00			/tab	
Amoxicillin	Amoxil	Beecham		30			/tab	
Amoxicillin	Kam Amoxy	KPI		30			/tab	
Lowest price generic equivalent				30			/tab	
Artemether	Artenam	Arenco		14			/tab	
Artemether	Artemedline	Kunming		14			/tab	
Lowest price generic equivalent				14			/tab	
Atenolol	Ternomin	Astra Zeneca		28			/tab	
Atenolol	Catenol	Cadila		28			/tab	
Lowest price generic equivalent				28			/tab	
Benzylpenicillin				1 vial 1MU			/vial	
Benzylpenicillin	Benzylpenicillin	Jiangxi Dongfeng		1 vial 1MU			/vial	
Lowest price generic equivalent				1 vial 1MU			/vial	
Betamethasone cream	Betnovate	GSK		15g			/g	
Betamethasone cream	Mediven	Regal		15g			/g	
Lowest price generic equivalent				15g			/g	
Captopril	Capoten	BMS		60			/tab	
Captopril	Epsitron	Remedica		60			/tab	
Lowest price generic equivalent				60			/tab	
Carbamazepine	Tegretol	Novartis		100			/tab	
Carbamazepine	Carbadac	Cadila		100			/tab	

Salbutamol inhaler	Salbutamol	Norton							
Lowest price generic equivalent					1 inhaler 200doses				/dose
Stavudine	Zerit	BMS			1 inhaler 200doses				/dose
Stavudine	Stavir-40	Cipla			60				/tab
Lowest price generic equivalent					60				/tab
Zidovudine	Retrovir	GSK			100				/capsule
Zidovudine	Zidovir 100	Cipla			100				/capsule
Lowest price generic equivalent					100				/capsule

Annex 3: Affordability of 10 Treatments

		Daily wage of lowest paid government worker (in local currency): 2500											
		Public Procurement			Public Patient			Private Retail			Other Patient		
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Diabetes													
Glibenclamide	5 mg	cap/tab	30	60	Brand								
					Most Sold	387.28	0.2	60.00	0.0	3900.00	1.6	3000.00	1.2
					Lowest Price								
Hypertension													
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Atenolol	50 mg	cap/tab	30	30	Brand								
					Most Sold					42000.00	16.8		
					Lowest Price	1193.02	0.5			225 0.00	0.9		
										3000.00	1.2	3000.00	1.2
Adult resp. infects.													
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Amoxicillin	250 mg	cap/tab	7	21	Brand								
					Most Sold					10500.00	4.2		
					Lowest Price	632.68	0.3	21.00	0.0	1575.00	0.6	2100.00	0.8
Pediatric resp. infects.													
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Co-trimoxazole suspension	8+40 mg/ml	millilitre	7	70	Brand								
					Most Sold					1108.33	0.4		
					Lowest Price	377.35	0.2			933.33	0.4	1108.33	0.4

Gonorrhoea		Public Procurement			Public Patient			Private Retail			Other Patient		
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Ciprofloxacin	500 mg	cap/tab	1	1	Brand								
					Most Sold			200.00	0.1				
					Lowest Price	49.12	0.0	1.00	0.0	200.00	0.1	350.00	0.1
Depression						Public Procurement		Public Patient		Private Retail		Other Patient	
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Amitriptyline	25 mg	cap/tab	30	90	Brand								
					Most Sold			4500.00	1.8				
					Lowest Price	1071.32	0.4	4500.00	1.8	2700.00	1.1		
Asthma						Public Procurement		Public Patient		Private Retail		Other Patient	
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Salbutamol inhaler	0.1 mg/dose	dose	as needed	200	Brand	3644.30	1.5			14000.00	5.6		
					Most Sold			5000.00	2.0				
					Lowest Price			5000.00	2.0				
Peptic ulcer						Public Procurement		Public Patient		Private Retail		Other Patient	
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Ranitidine	150 mg	cap/tab	30	60	Brand					90000.00	36.0		
					Most Sold			6000.00	2.4				
					Lowest Price	2102.14	0.8	7500.00	3.0	6000.00	2.4	6000.00	2.4

Hypertension		Medicine Strength		Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Public Procurement		Public Patient		Private Retail		Other Patient	
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days)	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages	Median Treatment Price	Days Wages
Captopril	25 mg	cap/tab	30	60	Brand										
					Most Sold							9000.00	3.6		
					Lowest Price	3000.00	1.2	60.00	0.0	9000.00	3.6	10500.00	4.2		
Hypertension		Medicine Strength		Dosage Form	Treatment Duration (in Days) <td>Total # of Units per Treatment</td> <td>Product Type</td> <td colspan="2">Public Procurement</td> <td colspan="2">Public Patient</td> <td colspan="2">Private Retail</td> <td colspan="2">Other Patient</td>	Total # of Units per Treatment	Product Type	Public Procurement		Public Patient		Private Retail		Other Patient	
Select Medicine Name	Medicine Strength	Dosage Form	Treatment Duration (in Days) <td>Total # of Units per Treatment</td> <td>Product Type</td> <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages</td> </td></td></td></td>	Total # of Units per Treatment	Product Type	Median Treatment Price	Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages</td> </td></td></td>	Median Treatment Price	Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages</td> </td></td>	Median Treatment Price	Days Wages <td>Median Treatment Price</td> <td>Days Wages <td>Median Treatment Price</td> <td>Days Wages</td> </td>	Median Treatment Price	Days Wages <td>Median Treatment Price</td> <td>Days Wages</td>	Median Treatment Price	Days Wages
Nifedipine Retard	20 mg	tab	30	60	Brand										
					Most Sold							6000.00	2.4		
					Lowest Price			60.00	0.0	6000.00	2.4	6000.00	2.4	6000.00	2.4

Annex 4: Price Components for 10 Medicines

Describe sector and type of medicine:		Private pharmacies - LPG									
Example Name	1:Medicine Name	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative Mark-up %	
	Diazepam	5 mg	cap/tab	100	100	Cost, insurance, freight (CIF) price	NA	NA	613.11	0.00%	
						Clearing and Handling	percent	3.00%	631.50	3.00%	
						Importer and Wholesale Mark Up	percent	144.00%	1540.87	151.32%	
						Retail Mark -Up	percent	228.00%	5054.05	724.33%	
Describe sector and type of medicine:		Private pharmacies -Brand									
Example Name	2:Medicine Name	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative Mark-up %	
	Albendazole	200mg	cap/tab	2	2	Cost, insurance, freight (CIF) price	NA	NA	3624.11	0.00%	
						Clearing and Handling	percent	2.00%	3696.59	2.00%	
						Importer and Wholesale Mark Up	percent	33.00%	4916.47	35.66%	
						Retail Mark Up (Varies)	percent	28.00%	6293.08	73.64%	
Describe sector and type of medicine:		Private pharmacies - Most Sold Generic									
Example Name	3:Medicine Name	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative Mark-up %	
	Amitriptyline	25 mg	cap/tab	100	1	Cost, insurance, freight (CIF) price	NA	NA	6.95	0.00%	
						Clearing and Handling	percent	3.00%	7.16	3.00%	
						Importer and Wholesale Mark Up	percent	69.00%	12.10	74.07%	
						Retail Mark Up (Varies)	percent	720.00%	99.20	1327.37%	
Describe sector and type of medicine:		Private pharmacies -Brand									
Example Name	4:Medicine Name	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative Mark-up %	

Sulfadoxine -pyrimethamine	500+25 mg	cap/tab	3	3	Cost, insurance, freight (CIF) price	NA	NA	333.33	0.00%	
					Clearing	percent	3.00%	343.33	3.00%	
					Importer Mark Up	percent	23.00%	422.30	26.69%	
					Wholesale Mark Up	percent	2.00%	430.75	29.22%	
					Retail Mark Up	percent	365.00%	2002.97	500.89%	
Describe sector and type of medicine:										
Example Name	5:Medicine	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative % Mark -up
Rifampicin + Isoniazid		150+100 mg	cap/tab	1	1	Cost, insurance, freight (CIF) price	NA	NA	81.75	0.00%
						Clearing Charges	percent	3.00%	84.20	3.00%
						Importer and Wholesale Mark Up	percent	79.00%	150.72	84.37%
						Retail Mark Up	percent	99.00%	299.94	266.90%
Describe sector and type of medicine:										
Example Name	6:Medicine	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative % Mark -up
Amoxicillin		250 mg	cap/tab	21	30	Cost, insurance, freight (CIF) price	NA	NA	845.40	0.00%
						Clearing Charges	percent	3.00%	870.76	3.00%
						Importer and Wholesale Mark Up	percent	33.00%	1158.11	36.99%
						Retail Mark Up	percent	159.00%	2999.51	254.80%

Private pharmacies -Most Sold Generic										
Example Name	7:Medicine	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative % Mark - up
Ranitidine		150 mg	cap/tab	60	100	Cost, insurance, freight (CIF) price	NA	NA	4165.00	0.00%
						Clearing	percent	3.00%	4289.95	3.00%
						Importer Mark Up	percent	15.00%	4933.44	18.45%
						Wholesale Mark Up	percent	10.00%	5426.79	30.30%
						Retail Mark Up	percent	86.00%	10093.82	142.35%
Describe sector and type of medicine: Private pharmacies -Brand										
Example Name	8:Medicine	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative % Mark - up
Betamethasone Cream		0.001	gram	15	15	Cost, insurance, freight (CIF) price	NA	NA	3238.00	0.00%
						Clearing	percent	3.00%	3335.14	3.00%
						Importer and Wholesale Mark Up	percent	33.00%	4435.74	36.99%
						Retail Mark Up	percent	48.00%	6564.89	102.75%
Describe sector and type of medicine: Private pharmacies -MSG										
Example Name	9:Medicine	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative % Mark - up
Sulfadoxine -pyrimethamine		500+25 mg	cap/tab	3	3	Cost, insurance, freight (CIF) price	NA	NA	183.93	0.00%
						Clearing Charges	percent	2.00%	187.61	2.00%
						Importer and Wholesale Mark Up	percent	6.00%	198.87	8.12%
						Retail Mark Up	percent	410.00%	1014.21	451.41%
Describe sector and type of medicine: Private pharmacies -MSG										
Example Name	10:Medicine	Medicine Strength	Dosage Form	Target Pack Size	Dispensed Quantity	Type of Charge	Charge Basis	Amount of Charge	Price of Dispensed Quantity	Cumulative % Mark - up
Nystatin		100,000 IU	Pessary	14	14	Cost, insurance, freight (CIF) price	NA	NA	613.11	0.00%
						Clearing Charges	percent	2.00%	625.37	2.00%
						Importer Mark Up	percent	61.00%	1006.85	64.22%
						Wholesale Mark Up	percent	32.00%	1329.04	116.77%
						Retail Mark Up	percent	30.00%	1727.75	181.80%

Glossary of Terms

Active pharmaceutical ingredient (API)

The chemical substance responsible for a product's effect.

Affordability

The cost of treatment in relation to peoples' income. In this survey, the daily wage of the lowest paid unskilled national government worker is used for comparison with the cost of a defined course of treatment for a specific condition.

Brand name

Name given to a pharmaceutical product by the manufacturer: e.g. Valium is the Innovator Brand name (also called trade name) for diazepam. The use of this name is reserved exclusively to its owner as opposed to generic names.

Cost, insurance, freight (CIF)

Shipping term meaning the seller must pay the costs, insurance and freight charges necessary to bring the goods to the port of destination.

Dosage form

The administration form of the completed pharmaceutical product: e.g. tablet, capsule, mixture, and injection. Also called dose form or dosing unit.

Drug Shop

A term sometimes used to describe a shop that is not owned or run by a pharmacist and that has a limited license. However, in this survey "medicine outlet" is used more broadly to identify any place, in which medicines are sold, including pharmacies/dispensaries in public and NGO health facilities, private hospitals, etc.

Essential medicines

Essential medicines are those medicines that satisfy the priority health care needs of the population

Free on board (FOB)

Shipping term meaning the buyer must pay all costs and insurance against risks of damage once goods are loaded for shipping.

Generic medicine

A pharmaceutical product usually intended to be interchangeable with the Innovator Brand product, manufactured without a license from the Innovator manufacturer and marketed after the expiry of patent or other exclusivity rights.

International Non-proprietary Name (INN)

A common, generic name selected by designated experts for the unambiguous identification of a new pharmaceutical substance. The selection process is based on a procedure and guiding principles adopted by the World Health Assembly. INNs are recommended for worldwide use.

Lowest price generic equivalent

The generic form of a product as obtained at the time of data collection from each individual pharmacy surveyed. The lowest price generic for each medicine varied from pharmacy to pharmacy

Mark-up

A certain percentage added to a purchasing price to cover the cost and profit of the wholesaler or retailer.

Median

There are three ways of expressing the average value: mean, median and mode. The mean is simply the sum of the values divided by the number of values. The median is the value that divides the distribution in half. If the observations are arranged in increasing order, the median is the middle observation. The median is a useful descriptive measure if there is an asymmetrical distribution of the data or there are one or two extremely high or low values, which would make the mean unrepresentative of the majority of the data. The median is correctly used with the interquartile range to summarize markedly non-normally distributed (asymmetrical) data. See "Percentile".

Median Price Ratio (MPR)

Reference prices are internationally available lists of prices against which the local prices are compared by means of a ratio. 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 imply that the local medicine price is twice that of the international reference price.

Medicine

Any dosage form containing a substance approved for the prevention and treatment of disease. The term "medicine" is increasingly used to distinguish it from a drug as a substance that is misused.

Most sold generic equivalent

This is the generic form of a given product as determined from a mini-survey by telephone of regional Wholesale pharmacies based on the volumes of sales. The most sold generic for each medicine was the same throughout the country.

MSH (Management Sciences for Health) reference prices

The MSH issues an annual International Price Indicator Guide (<http://erc.msh.org>).

It has two sections. The first section lists procurement prices offered by not-for-profit suppliers to developing countries for multi-source generically equivalent products.

The second section lists tender prices offered to procurement agencies in developing countries. The number of suppliers listed for each product may vary. For each product, a mean and a median unit price is calculated. The median price is used in this manual as the international reference price. The tender price section is used only for products that have no procurement price.

Patent

A title granted by the public authorities that confers a temporary monopoly for the exploitation of an invention upon the person who reveals it, furnishes a sufficiently clear and full description of it and claims this monopoly.

Percentile

The range of values containing the central half of the observations: that is, the range between the 25th and 75th percentiles (the range including the values that are up to 25% higher or down to 25% lower than the median) is called the interquartile range. It is used with the median value (instead of the mean \pm standard deviation) to report data that are markedly non-normally distributed. (Standard deviation: a measure describing the range of the data when using the mean.)

Pharmaceutical equivalence

Medicines with identical amounts of the same active ingredient in the same dosage form and route of administration, that meet the standards of strength, quality, purity, and identity.

Pharmaceutical product

Any medicine intended for human use, presented in its finished dosage form that is subject to control by pharmaceutical legislation (registered). A product may be sold under a Brand name (e.g. Valium) or under the generic name (e.g. diazepam).

Procurement price

The price paid by the government, wholesalers and other purchasers to procure medicines. Different prices may be paid for the same product by a public sector purchaser, such as the Ministry of Health, the health facility that supplies the medicine to the patient, and the individual who purchases the medicine.

Retailer

A company that sells goods to consumers. In the pharmaceutical sector, the retailer is the pharmacy or any other medicine outlet. In Uganda there are at least two different types of shops in which medicines can be purchased: pharmacies with a registered pharmacist and drug shops/outlets with a registered paramedical staff

Retail mark-up

A percentage added to the purchasing price to cover the retailer's costs and profit.

Trade-Related Aspects of Intellectual Property Rights (TRIPS)

An agreement annexed to the World Trade Organization convention aimed at strengthening and harmonizing aspects of the protection of intellectual property at the global level. It includes trademarks and patents as well as other forms of intellectual property.

Wholesaler

A company that buys goods from a manufacturer or importer and sells it to retailers. The number of wholesalers in the pharmaceutical sector varies between countries, from one state wholesaler to more than 500. The wholesaler may be an agent for one company only or deal with products from several companies. Manufacturers may also be wholesalers for their own products.

Wholesale mark-up

A percentage added to the purchasing price to cover the wholesaler's costs and profit

