Medicine Prices, Availability, Affordability and Price Components in Oman

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Sultanate of Oman

Ministry of Health

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Foreword

It is my great pleasure to introduce to you this report on Medicines Availability, Prices and Affordability conducted in Oman in October 2007. The main objectives of this survey were to document the prices, availability and affordability of selected key medicines and compare them across the public and private sectors and with other countries. This will be very useful for our future planning to strengthen the National Drug Policy as well as to carry out our responsibility to assure that dugs available in Oman are of good quality, safe, efficacious and affordable at reasonable prices all of the time.

I would like to express my sincere appreciation to all those who contributed in bringing out this important work and publication and commend them for their careful and diligent work.

Dr. Ahmed Mohd Al Saidi
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Conflict of interest:

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

Note: this report has been amended from the original in keeping with Health Action International data reporting requirements.

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List of abbreviations and acronyms used in the report

Cap: Capsule

CDC: Central Drug Committee

CIF: Cost, Insurance & Freight

CMS: Central Medical Stores

EML: WHO. Essential Medicines List

FOC: Free Of Charge

GCC: Gulf Cooperation Council

HAI: Health Action International

Inh: Inhaler

Inj: Injection

IQR: Interquartile Range the; range or differences between the 1st and 3rd quartiles (25th and 75th percentiles).

IRP: International Reference Prices; they are international non-profit tender prices of *generic medicines* listed in the MSH international medicine price indicator guide and they were used to provide a measurement against which prices can be compared

LPG: Lowest Priced Generic; generic product with the lowest price found on the day of the survey at each facility.

MOH: Ministry of Health

MPR: Medicine Price Ratio (Median price ÷ IRP)

MSH: Management Sciences for Health

OB: Originator Brand products: the original patented pharmaceutical product.

OR: Omani Riyal

Susp: Suspension

Tab: Tablet

USD: United States Dollar (also $)

WHO: World Health Organization

Notes:

1. The generic names of medicines used in the report are their International Non-Proprietary Names (INN).
2. When referring to the survey medicines in the text, often only the generic name of the medicine is used. It should be recognized that this implies the medicine in the exact strength and dosage form as required by the HAI/WHO methodology, and does not necessarily apply to other forms and strengths.
3. When the term "brand" is used in the text, it should be taken to mean the originator brand.

Executive Summary

Background: A field study to measure the availability and affordability of a number of medicines was undertaken in the public and private sector pharmacies in Oman in October 2007 using a standardized methodology developed by the World Health Organization (WHO) and Health Action International (HAI).

Methods: The total number of medicines included in the survey was 42 - 14 global list medicines, 16 regional list medicines and another 12 medicines chosen by the committee to be included in the survey as a Supplementary List particularly;

- To replace those medicines in the core lists whose strengths are not approved by the MOH for use in public facilities.
- Those which were expected to have a high level of use locally.

The survey was conducted in six health regions: Muscat Governorate (capital city), Dhofar Governorate, North Batina Region, North Sharqiya Region, South Sharqiya Region and Al Dakhliya Region. Data on the 42 medicines were collected in 30 public and 32 private sector medicine outlets, selected using a validated sampling frame. Al Wusta Region and Musandam Governorate were excluded due to their low population and non-availability of a sufficient number of private pharmacies. Al Dahira, South Batina Regions and Al Buraimi Governorate were excluded due to non-availability of private pharmacies around the health centers.

For each medicine in the survey, data were collected for the originator brand and the lowest priced generic equivalent (generic product with the lowest price available at the facility). Public procurement prices were obtained from the MOH Central Medical Stores (CMS). Medicine prices are expressed as ratios relative to the Management Sciences for Health (MSH) International Drug Price Indicator Guide prices for the year 2006 – considered here as international reference prices (IRP). These ratios are known as Median Price Ratios (MPR). Using the wage of the lowest-paid unskilled government worker, affordability was calculated as the number of days' wages this worker would need to purchase standard treatments for common conditions. The price components survey performed was based on the official policy related to price components.

Table: Summary of mean availability and median price ratios for survey medicines

List	Type of product	Mean availability	Median (MPR)	25th percentile	75th percentile	Minimum MPR	Maximum MPR
Public sector – Availability (30 pharmacies) and Procurement price (1 order)							
All survey medicines list (the 42 medicines list)	brand	13.0 %	5.8	4.81	7.09	3.56	20.73
	generic	68.3 %	0.95	0.67	1.33	0.26	13.82
Global List	brand	7.1 %	4.57	4.57	4.57	4.57	4.57
	generic	65.0 %	0.88	0.69	1.28	0.52	13.82
Regional List	brand	19.8 %	5.80	5.03	9.75	3.56	20.73
	generic	59.4 %	1.11	0.42	1.18	0.26	8.67
Supplementary List	brand	10.6 %	7.43	7.43	7.43	7.43	7.43
	generic	84.2 %	0.95	0.73	1.52	0.34	4.49
Essential Medicines List (EML)	brand	14.4 %	5.80	4.81	7.09	3.56	20.73
	generic	75.4 %	0.95	0.67	1.33	0.26	13.82
Private sector (32 pharmacies)							
All survey medicines list (the 42 medicines list)	brand	50.6 %	22.44	11.51	47.35	1.60	156.28
	generic	55.3 %	7.39	4.32	12.67	1.34	102.68
Global List	brand	46.4 %	36.21	20.42	54.59	5.78	132.37
	generic	69.0 %	12.64	7.79	16.27	1.81	35.96
Regional List	brand	54.1 %	22.44	12.08	37.23	2.53	156.28
	generic	37.3 %	7.39	3.37	10.96	2.01	102.68
Supplementary List	brand	50.9 %	13.49	4.15	18	1.60	102.96
	generic	63.3 %	5.58	4.61	6.64	1.34	19.88
Essential Medicines List (EML)	brand	49.7 %	18.75	9.35	47.35	1.60	156.28
	generic	54.8 %	8.51	3.81	13.01	1.34	102.68

Key Results:

1. **<u>Availability of generic medicines in the public sector:</u>**

- Of the 42 survey medicines included in the Global and Regional lists some strengths were not approved for MOH facilities and, therefore, unavailable in the public sector, e.g. amoxicillin 500mg capsules, amoxicillin suspension 250mg/5mL, ciprofloxacin 500mg tablets and metronidazole 200mg tablets. This explains the results of the global list availability being 7.1% for originator brands (OB) and 65.0% for generics and the regional list 19.8% for OB and 59.4% for generics. The median availability of all 42 survey medicines was 13.0% for OB and 68.3% for generics.

- The non-availability of the above-mentioned non-approved products were taken into account by considering (i) only the supplementary medicines in the survey where availability was 10.6% (OB) and 84.2% (generics) and (ii) looking at the mean availability of medicines on the national essential medicines list (MOH approved list) where availability was 14.4% (OB) and 75.4% (generics). However, this will still underestimate public availability since some medicines are only available at hospital or higher level facilities, not at smaller health centres.

- Given the high availability of medicines in the public sector it is likely that the majority of patients will get their medicines there.

- Generic medicines were the predominantly available type of medicine in public sector.

2. **Availability of medicines in the private sector:**

- Mean availability of the 42 surveyed medicines as originator brand and generic medicines was 50.6% and 55.3% respectively.
- In this sector, both originator brands and lowest priced generics were found with almost similar prevalence

3. **Public sector procurement prices.**

- The public sector is procuring generics at slightly lower than their international reference prices (Median MPR=0.95), originator brands were more than 5 times

higher than their international reference prices (Median MPR=5.8). The interquartile range shows slight variation in median price ratio across individual medicines.

- For the originator brand (OB) the maximum (MPR) was 20.73 (albendazole 200mg tablets) meaning that the procurement price for the originator brand albendazole 200mg is 20 times higher than generic products available on the international market (the MSH price), the median (MPR), was 5.8, and the minimum (MPR) was 3.56 (gliclazide).
- For the generic products, the maximum MPR was 13.82 (diazepam i.e. the price of generic diazepam was around 13 times higher than the MSH price for other generics available on the international market), median MPR was 0.95 and the minimum MPR was 0.26 (lisinopril) i.e. the price was around 80% less than MSH price.
- The interquartile range shows little variation in median price ratio across individual medicines.
- From the above data, public procurement policies applied by the Central Medical Stores successfully obtained competitive prices of medicines when compared to the International Reference Prices (international non-profit tender prices of mostly generic medicines).

4. **Private sector patient prices:**

- Lowest price generic medicines were priced at 7.39 times their international reference price, while originator brand medicines were priced at 22.44 times their international reference price.
- Half of the originator brand medicines were priced at between 11.51 to 47.35 times their international reference price. There is therefore moderate variation in MPRs across individual originator brand medicines in the private sector while half of the lowest priced generic medicines were priced at 4.32 to 12.67 times their international reference price.
- For the originator brand (OB), the maximum MPR was 156.28 (fluoxetine) meaning that the patient price for the originator brand fluoxetine is 156 times higher than the MSH price, the median MPR was 22.44, and the minimum MPR was 1.6 (isosorbide dinitrate).

- For the generic products, the maximum MPR was 102.68 (fluoxetine) which means its price was 102 times higher than MSH price for other generic, the median MPR was 7.39 and the minimum MPR was 1.34 (co-amoxiclav 375mg tablets).
- In the private sector, originator brands cost twice as much as i.e. 100% more than, on average, their generic equivalents (median MPR was 22.4 for OB and 10.1 for matched originator brand and equivalent generic product pairs respectively, showing that patients are paying substantially more to purchase originator products as compared to the lowest price generics.
- Results of median MPRs of 33 medicines (6 brands and 27 generics) found in both sectors show that the final prices to the patient in the private sector are 250% higher than in the public sector for OB and 646% higher than the public sector for generic equivalents.

5. <u>Affordability of standard treatment regimens in private sector:</u>

- Using the lowest-paid unskilled government worker, affordability was calculated as the number of days wages this worker would need to purchase standard treatments for common conditions. The lowest-paid unskilled government worker earns 105/- OR per month, i.e. 3.5/- RO per day
- In the private sector, the majority of treatments cost close to the daily wage of the lowest paid government worker when lowest price generics are used. The treatment of diabetes using generic medicines (glibenclamide, gliclazide, metformin) would cost 0.3 to 1.2 days' wages per month, while that of ulcer with generic medicines (omeprazole, ranitidine) would cost 1.6 to 3.1 days' wages and treatment of hypertension with generics would cost 0.4 to 2.3 days' wages, unless nifedipine retard was used (4 days' wages), which has no generics available.
- Some treatments are clearly costly even when either generics or originator brands are used such as hypercholesterolaemia (simvastatin) or depression (fluoxetine). Atorvastatin has no generic so it would cost a patient treated with atorvastatin 9 days' wages to purchase one month of treatment.
- Many of the standard treatments are affordable when originator brand medicines are purchased in the private sector.
- If originator brands are prescribed and dispensed, the lowest paid government worker would need to spend between 23.6 and 10.4 days wages to purchase

medicines for depression (fluoxetine) or peptic ulcer (omeprazole) from the private sector.

- Only originator brands would be used for some medicines as there are no generic equivalents where they will be unaffordable for the patients such as hypercholesterolaemia (atorvastatin) where it costs the patient 9 days wages for one month treatment.

Table: Number of day's wages of the lowest paid government worker needed to purchase standard treatments from private sector

Disease condition and standard treatment			Days wages to pay for treatment	
Condition	Medicine	Treatment course	OB	LPG
Asthma	Salbutamol inhaler 100mcg/ dose	1 inhaler of 200 doses	1.4	0.3
	Beclometasone inhaler 0.05 mg/ dose	1 inhaler of 200 doses	NA	0.6
Diabetes	Glibenclamide 5mg tablets	1 tab x 2 x 30 days= 60 tablets	1.8	0.9
	Gliclazide 80mg	1 tab x 2 x 30 days = 60 tablets	2.2	1.2
	Metformin 500mg	1 tab x 2 x 30 days = 60 tablets	0.5	0.3
Hypertension	Atenolol 50mg tablets	1 tablet x 30 days= 30 tablets	1.1	0.4
	Lisinopril 10mg tablets	1 tablet x 30 days= 30 tablets	2.7	2.3
	Nifedipine retard 20 mg tablets	1 cap. x 2 x 30 days= 60 caps.	4	NA
Hypercholesterol-aemia	Simvastatin 20mg tablets	1 tablet x 30 days= 30 tablets	8.5	3.3
	Atorvastatin 20mg tablets	1 tablet x 30 days= 30 tablets	9	NA
Depression	Amitriptyline 25mg caps.	1 cap. x 3 x 30 days= 90 caps.	1.3	NA
	Fluoxetine 20mg tablets	1 cap. x 2 x 30 days= 90 caps.	15.8	10.4
Adult respiratory infection	Ciprofloxacin 500mg tablets	1 tablet x 2 x 7 days= 14 tablets	6.1	0.6
	Amoxicillin 500mg caps.	1 caps x 3 x 7 days= 21 caps.	0.8	0.4
Anxiety	Diazepam 5mg tablets	1 tablet x 7 days	0.2	NA
Arthritis	Diclofenac 50mg tablets	1 tablet x 2 x 30 days = 60 tablets	5	0.7
Pain/Inflammation child (1 year)	Paracetamol 24mg/mL suspension	120mg = (5mL) x 3 x 3 days = 45mL	0.1	0.1
Ulcer	Omeprazole 20mg tablets	1 tablet x 30 days = 30 tablets	10.4	3.1
	Ranitidine 150mg tablets	1 tablet x 2 x 30 days = 60 tablets	5.7	1.6

Recommendations

- Revision of prices of all Originator Brands which are now off-patent.

- Encourage procurement of generics for nifedipine retard, atorvastatin, fluoxetine

[redacted]

6. **Medicine price components:**

Add-on costs, such as import tariff, and wholesale and retail mark-ups, contribute substantially to the final price of medicines. In the private sector, add-on costs represent 55 % of the final patient price for imported medicines and 34% for locally produced generics.

7. **International comparisons:**

The results of the international comparison suggest that Oman generally has comparable availability, comparable prices, and similar affordability, to the other countries included in the analysis.
More in-depth analysis, considering additional factors like size of the markets, capabilities of the national pharmaceutical manufacturing sector, the effect of mark-ups at national and local levels and economic indicators, is needed to reveal the reasons for variation between different countries. Such information can be useful for policy makers and governments in deciding whether any appropriate interventions can be made to make medicines more affordable and accessible in each country. Further studies and comparisons between high and low-income countries can also provide an evidence base for equity or differential pricing strategies by multinational manufacturers whereby less wealthy populations pay less than wealthier countries for essential medicines.

:Discussion

The results of this medicine price survey provide insight into the availability, price and affordability of medicines in Oman. The use of the WHO/HAI medicine prices survey has allowed the measurement of medicine prices and availability in a reliable and standardized way that enables valid international comparisons to be made. A further strength of the methodology is the multiple steps taken to ensure data :quality

- training of survey personnel including a data collection pilot test,
- pairs of data collectors to cross-check results,
- double entry and verification of data into the computerized survey workbook,
- a data checker function in the workbook that identifies outlier or erroneous entries and

- quality control checks at multiple stages.

Study results may be limited by the fact that data are inherently subject to outside influences such as market fluctuations and delivery schedules. In addition, the reliability of median price ratios (MPRs) is dependant on the number of supplier prices used to determine the median MSH price of each medicine used as international reference prices. In cases where very few supplier prices are available, or where there is no supplier price and the buyer price is used as a proxy, MPR results can be skewed by a particularly high/low international reference price. A further limitation is that availability is determined only for the list of survey medicines, and therefore does not account for the availability of alternate strengths or dosage forms, or of therapeutic alternatives.

Recommendations:

It is recommended that the following steps be taken to improve medicine prices, availability and affordability:

1. Maintain the efficiency of Central Medical Stores in public procurement.
2. Issue lists of poorly available generics and give incentives for suppliers to make them available in private retail pharmacies.
3. To adopt pro-generic use policies (to improve availability in pharmacies, to improve patients awareness and to improve doctors prescribing habits)
4. Promote prescribing and use of medicines by generic name in public and private health sectors
5. To go forward with implementation of effective healthcare insurance plans to encompass all Oman residents.
6. Other living costs and expenses such as food, education, water, electricity bills, home rentals…etc to be incorporated or included in measurement of affordability of medicines
7. Carry out a more comprehensive HAI-based medicines prices survey to include other medicines and to compare them to neighbouring countries like UAE and KSA.
8. To reduce the medicines mark-up to be in line with what's been implemented by UAE 45% and KSA 34%.
9. To locate medicines of high MPR, and consider re-pricing extremely high MPR medicines especially for those with available generics
10. To carry out surveys to investigate reasons hindering generics from market penetration on all levels (Patient-, Physician-, Pharmacy-related factors, etc.) to come up with more evidence-based approaches.
11. To carry out survey on medicines prices for those medicines dispensed for inpatients in private hospitals. Then to come out with a pricing policy of medicines in this circumstance.

12. To encourage local pharmaceutical manufacturers to produce high demand medicines with competitive prices.

Introduction:

In Oman, there has been a growing public concern about the availability of medicines and their affordability in the private sector as well as the government (public) sector especially after the medicines pricing policy was implemented in January 2001. Simultaneously, the private medical sector has been growing rapidly during the last few years which is clearly evident from the increasing number of private polyclinics and private hospitals. Therefore, it was judged appropriate to conduct a review of medicine availability and prices to know the current status in Oman. The recent launch of standardized methodology for measuring medicines prices by the World Health Organization (WHO) and Health Action International (HAI) was a further stimulus. The WHO/HAI methodology is designed for the collection and analysis of essential / key medicines prices in a standardized way. The approach involves a systematic survey to collect accurate data and reliable price information on a selected number of medicines and to compare it to an International Reference Price (IRP) to facilitate the price comparisons. It is designed to measure particular medicines prices at a certain point in time, but can also be used to monitor them over a period of time.

In this regard, a three day training workshop for medicine price surveys was held in May 2007 in coordination between the Ministry of Health (MOH), Health Action International (HAI) and World Health Organization (WHO) regional office (EMRO). This workshop was attended by a number of pharmacists working in different regions in the Sultanate (at least one representative from each region or from the Directorate General). The training workshop was also attended by representatives from other countries such as Libya, Iran and the Kingdom of Bahrain.

It was recommended in the training workshop to carry out the survey in both the public sector and private sector in at least 5 regions plus Muscat, the capital, using a list of medicines. The Ministerial Decision No. 103/2007 dated 25/8/2007 was issued by His Excellency the Minister of Health forming a committee to set in place the necessary plans needed for the survey, to select the regions, health facilities and pharmacies to be included in the survey, to directly supervise all stages of the survey, to do the necessary analysis and price comparisons and to report the results and necessary recommendations if needed. The committee was given permission to approach the relevant persons and departments within the MOH in order to conduct the survey.

The objectives of the survey were to address the following questions:

- What prices do people and the government pay for key medicines?
- Do the prices and availability of the same medicines vary in public and private sectors?
- How efficient is the public sector medicine procurement system in terms of obtaining medicines at low cost for the country?
- How efficient is the pricing policy applied by the MOH for pricing medicines in the private sector?

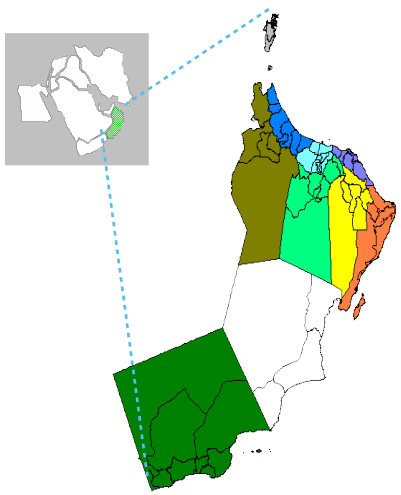
- What is the relative availability of originator brand products (OB) and generic equivalents in the public and private sectors?
- How do the prices of brand and generic products compare in the private sector to each other and to the same products in other countries, especially neighboring countries?
- What pricing mechanisms and tariffs exist for medicines in Oman?

Country Background:

Geographical Features

The Sultanate of Oman is located in the extreme southeastern corner of the Arabian Peninsula. It borders the United Arab Emirates on the northwest, Saudi Arabia on the west, and Yemen on the southwest. The coast is formed by the Arabian Sea on the south and east, and the Gulf of Oman on the northeast. The country also contains Madha, an exclave enclosed by the United Arab Emirates, and Musandam, an exclave also separated by Emirati territory.

Figure 1: Oman in relation to other Gulf countries



The total area of the Sultanate of Oman is approximately 309,500 square kilometers and is composed of varying topographic areas consisting of plains (3%), mountains (15%) and wadis (dry river beds) and desert (82%).

The climate differs from one area to another; it is hot and humid in the coastal areas in summer, hot and dry in the interior with exception of higher mountains and Dhofar Governorate, which enjoy a moderate climate throughout the year.

Oman is classified as an upper-middle income country with per capita Gross Domestic Product (GDP) at current prices of 15,512.0 (million Omani Rials) in 2007. Over 90% of the national income is from crude oil. Agriculture is limited and industrial activity is beginning to develop. The currency is the Omani Rial (OR or RO).

The Sultanate of Oman is administratively divided into 5 Regions and 4 governorates with 61 Wilayats. The regions are: Al- Dakhliyah, Al- Sharqiyah, Al- Batinah, Al- Dhahirah, and Al-Wusta, and the governorates are: Muscat, Dhofar, Musandam and Al-Buraymi Governorates. The regions of Al-Sharqiyah and Al-Batinah have each been further subdivided into two, for health administrative purposes, giving a total of 11 health regions.

Source: health indicators, annual health report 2007, department of health information and statistics, DGP

Demographic Features

The first General Census of Population, Housing and Establishments was carried out in the Sultanate of Oman in December 1993. The detailed results of the General Census were published after two years. According to the census, the population of Oman was about two million of which about 27% were non-Omanis. Before that first census, demographic information and population estimates and projections were based on survey results such as the 1985 "Demographic Survey" and the 1988 "Child Health Survey".
In 2003, the second General Census of Population, Housing and Establishments was carried out in the Sultanate of Oman; the census reference night was 7/12 - 8/12, 2003. Results showed that the total population was 2,340,815 of which 23.9% are non-Omani. Using the census results, population distribution and characteristics have been projected for mid-2007, details of which are presented in the Tables 1.

Table 1. Population Characteristics (Omani Population)*

Characteristics	2007
Population:	
Omani	1,922,697
Expatriates	820,802
Total	2,743,499
Omani Population Characteristics:	
Sex Ratio (males per 100 females)	102
Under 5 Years(% of Omani population)	11.58
Under 15 Years(% of Omani population)	36.2
60 Years and over (% of Omani population)	3.7
Females aged 15 to 49 Years(% of Omani population)	28.1
Females aged 15 to 49 Years(% of Omani females)	56.7
Married Females (%of Omani Females aged 15-49 years)#	50.2
Age Dependency Ratio (below 15& over 65 years to population 15-65 years)	0.62
Crude Birth Rate (per 1000 population)	25
Total Fertility Rate (births per woman 15-49 years)	3.13
Crude Death Rate (per 1000 population)	3.1
Life Expectancy at birth (in years) Overall	**72.0**
Males	70.4
Females	73.6

* Source: Ministry of National Economy, 2007

Source: National Health Survey 2000

Source: Population Characteristics, Annual Health Report 2007, Department of Health Information and Statistics, DGP

The Health System in Oman

The Ministry of Health (MOH) is the main health care provider and is responsible for ensuring the availability of health policies and plans and monitoring their implementation. Also the Ministry's organization had to be adapted in tune with the strategies and objectives that were crystallized during 1990. These can be summarized broadly as:

1. Regionalization of health services and decentralization of decision-making in specified technical, administrative and financial affairs.
2. Emphasizing the role and importance of planning.
3. Development of Education and Training in health.
4. Emphasizing the importance of health systems research.
5. Emphasizing the importance of regional and international relations.

Governmental health care facilities other than MOH in the country include: Armed Forces Medical Services (AFMS), Royal Oman Police Medical Services (ROPMS), Sultan Qaboos University Hospital (SQUH), Diwan Medical Services (Diwan MS), Petroleum Development Oman Medical Services (PDOMS). Table 2 shows health care facilities in the Sultanate of Oman other than MOH facilities.

Table 2. Health care facilities in the sultanate of Oman other than MOH facilities, December 2007

Name of Health care facilities	Hospitals	Clinics
Sultan Qaboos University Hospital	**1**	**1**
Armed Forces Medical Services	**3**	**31**
Royal Oman Police Medical Services	**1**	**3**
Diwan Medical Services	**0**	**1**
Petroleum Development Oman Medical Services	**0**	**9**
Total Health Care Facilities	**5**	**45**

Source: Monthly Statistical Bulletin, Ministry of National Economy, volume 18(4), April 30, 2007, Development in MOH Services Annual Health Report 2007, Department of Health Information and Statistics, DGP.

Public sector

The public sector provides preventive, curative, promotive and rehabilitative services through high-quality hospital and health centers that cover the Sultanate. Ministry of Health is running 49 hospitals including regional hospitals (13) which act as tertiary and secondary hospitals and provide services to people of the region, willayat hospitals (6) which act as secondary hospitals and provide primary and secondary health care and local hospitals (30) which provide primary health care services to nearby villages. In its support for health care, there are around 159 health centers which classified into health centers without beds provide only outpatient primary health care, health centers provide primary health care and are equipped with beds and extended health centers that provide primary health care and have some specialized clinics. The total human resources in the public sector are 22,709 in 2007. Treatment at all government institutions is free for

Omanis and for expatriates working in government services. This has resulted in high attendance rates, reaching 12.6 million visits during 1996. This number decreased to 10 million visits after introducing fees (200 Baisas/visit) in 1998 and in 2007 the total outpatient visits to MOH institutions were around 11,023,043.

Private Sector

The private sector is small compared to the public sector and caters mainly to expatriates employed outside the government sector. It has been expanded in the last few years as many Omanis also seek health care from this sector. The total number of private pharmacies was 350 and the total human resources were 4,038 in 2007.

Table 3. Health care facilities in private sector in the sultanate of Oman in 2007

Health care facilities	Number
private hospitals	4
Clinics and diagnostic clinics	741

The Pharmaceutical Sector

The Directorate General of Pharmaceutical Affairs & Drug Control (DGPA&DC) comes under the Office of Undersecretary of Health Affairs. DGPA&DC is the Drug Regulatory Authority within the Ministry of Health with the task to ensure that the drugs manufactured in Oman as well as those imported are safe, effective and meet the required standards. DGPA&DC plays an important role in the implementation and monitoring of the Oman National Drug Policy, which has been approved since May 2000.

The Directorate General of Medical Supply (DGMS) comes under the Office of the Undersecretary for Administrative and Financial Affairs. (DGMS) and is responsible for procurement, storage and distribution of all supplies of drugs, surgical and laboratory consumable items for all MOH Health Units.

The Directorate of Rational Use of Medicines (DRUM) comes under the office of Undersecretary of Health Affairs. Baseline & follow-up studies have been conducted based on the WHO core prescribing and dispensing indicators. These have been carried out in all regions of the Sultanate. In addition, patient care indicator studies have been carried out. In each region studies were conducted at all levels of the health system, primary, secondary and tertiary, since at the start of the programme all facilities handled outpatients.

:Registration and Drug Control

Drug registration started in 1987 with a first focus on drug products circulating in the unregulated private market at that time. The initial collection of information revealed that 532 manufacturers had marketed 8942 products in Oman. From that time onwards, 253 pharmaceutical manufacturers had withdrawn their products and accordingly 5,292 products disappeared from the market. However, by June 2000 only 324 companies have been registered after submitting the required information while 134 are rejected. Out of a total of 4725 product submissions, 3579 have been registered while 1146 products have been rejected.

Pharmaceutical regulation and control in Oman

The MOH Approved Drug List contains more than 500 chemical entities and over 900 drug products after the most recent revision in 1995 when about 150 items were deleted and over a 100 items were rejected. The preface to the list of approved drugs emphasizes the commitment of the MOH to the essential drug concept and states that drugs should be prescribed by generic name. The list identifies about 200 controlled items, which are for Specialist or Consultant prescription only.

References:

Civil Registration in the Sultanate of Oman; Its development and Potential Implication on Vital Statistics. Dr. Medhaat Elsayad, "Global Forum on Gender statistic", December 10-12, 2007 page 2, 3.

Annual Health Report 2007 MOH. Department of Health Information and Statistics, Directorate General of Planning.

Ministry of National Economy 2007, Major Economic and Social indicators.

Country profile: Oman http://www.fco.gov.uk/en/about-the-country profile 2007.

National Drug Policies Based on Essential Drugs, Sultanate of Oman, MOH, the DGPA,DGM,DRUM.

Methodology

Overview:

The survey was conducted by trained pharmacists and assistant pharmacists from the Ministry of Health using the standardized WHO/HAI methodology (WHO/HAI 2008). Data on the availability and final (patient) prices of medicines were collected in private pharmacies. In the public sector data were collected only on the availability since medicines are supplied free to patients (apart from the service fee). Procurement prices were obtained centrally from the CMS of the MOH.

A total of 42 medicines were surveyed - 30 from the WHO/HAI core list (14 global medicines, 16 regional medicines) and 12 medicines selected at the country level. For each medicine in the survey, up to two products were monitored namely;

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

All prices were converted to $US using the exchange rate (buying rate) on 28/10/2007, i.e. 1 USD = 0.3870 OR. The price component survey was not conducted with field visits since mark-ups are fixed by the MOH

and there is no variation in patient price for each brand name of medicine (originator brand / generic) among all regions and areas of the Sultanate.

Selection of medicine outlets:

Sampling was conducted in a manner consistent with the WHO/HAI validated methodology, which has shown to yield a nationally representative sample.

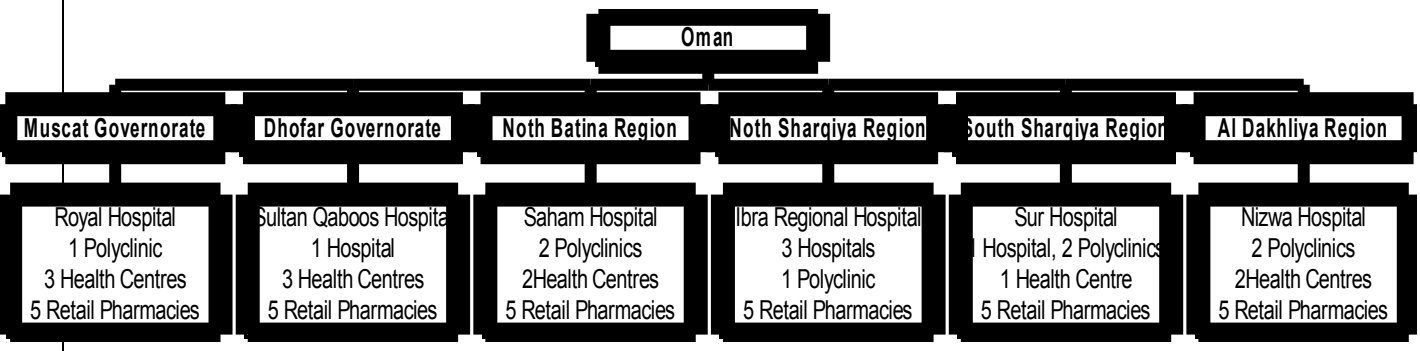
In the first step, six areas were selected as "survey areas" for data collection. The major urban center of Muscat Governorate was selected as one survey area, and an additional 5 areas were chosen at random from those which could be reached within a one day drive from Muscat. Al Wusta Region and Musandam Governorate were excluded due to their low population and non-availability of a sufficient number of private pharmacies. Al Dahira, South Batina Regions and Al Buraimi Governorate were excluded due to non-availability of private pharmacies around the health centers.

This resulted in the following six survey areas:

1. Muscat Governorate.
2. Dhofar Governorate.
3. Al-Dakhliya Region.
4. North Batina Region.
5. North Sharqiya Region.
6. South Sharqiya Region.

In each survey area, the sample of *public* medicine outlets was identified by first selecting the main public hospital (Royal Hospital, Sultan Qaboos Hospital, Nizwa Hospital, Saham Hospital, Ibra Regional Hospital and Sur Hospital). An additional four public medicine outlets per survey area were then selected at random from those within a 4 hour drive from the main hospital. This selection was made from all public facilities expected to stock most of the medicines in the survey. The public sector therefore contained five medicine outlets in each of the survey areas, for a total of 30 public outlets. The *private* sector sample was identified by selecting the private sector medicine outlet closest to each of the selected public medicine outlets. One back-up facility each was selected for both government and private health units in each region. This was done to ensure that, in the event that a selected facility was found without at least 50% of the medicines, the back-up facility would be surveyed.

Figure 2. Sample selection for the survey in Oman



Selection of medicines to be surveyed:

The original WHO/HAI manual provided a core list of 30 medicines, with the new methodology increasing this to 50 with 14 global core medicines and 16 regional core medicines. The total number of medicines included in this survey was 42 - 14 global list medicines, 16 regional list medicines and another 12 medicines chosen by the committee to be included in the survey as a Supplementary List particularly:

- To replace those medicines (forms and/or strengths) in the core list which are not approved by the CDC for the level of care of the MOH facilities (amoxicillin capsules 500mg, amoxicillin suspension 250mg/5mL, ciprofloxacin tablets 500mg & metronidazole tablets 400mg).
- To survey those medicines which were expected to have a high level of use.

N.B. The full list of medicines is provided in Annex1.

Data collection:

- The survey team consisted of a survey manager, 6 central supervisors, 6 area supervisors, 12 data collectors and 2 data entry personnel. Data collectors were pharmacists as well as asst. pharmacists. All central supervisors received training in the standard survey methodology and data collection/data entry procedures at a workshop held between, 13-16 May 2007. As part of the workshop, a data collection pilot test was conducted at public and private medicine outlets which did not form a part of the survey sample.
- Data collection took place between 28-30 October 2007. Each team visited medicine outlets and collected information on medicine availability and price using a standard data collection form specific to the 42 medicines being surveyed in Oman (Annex 2). For each medicine in the survey, data were collected for the originator brand and the lowest priced generic equivalent (generic product with the lowest price available at the facility on the day). Central and area supervisors checked each data collection form before leaving each facility. Upon completion of the survey, data filled into data collection forms were checked prior to data entry.

- When data collectors did not find at least 50% of the targeted medicines in any facility, a back up facility was visited.
- Public procurement data was collected on the prices that the government pays to procure the 42 surveyed medicines. Procurement data (prices) were obtained on 30/10/2007 from one procurement order from the MOH Central Medical Stores (CMS) for products in stock and based on the most recent available data.
- Written instructions for data collection procedures were given to each member in a team. They acted as guidelines for collection procedure and gave answers to certain circumstances that collectors may come across during data collection. This ensured that data collection was performed uniformly and reliably by each team. (Annex 3).
- For each survey medicine, data was collected only for the dosage form and strength listed (tablets/caps were considered equivalent, except for slow release, retard, enteric coated formulations they are modified release formulations and were considered as separate products.
- The next largest pack size was selected when the recommended pack size was not found and other pack sizes were available.
- Data was provided as a unit price only and not according to pack size. Medicine unit price = (Price of pack found ÷ Pack size found).
- The medicine had to be physically seen for the survey to be accurate. If any facility was out-of-stock of a product, it was recorded as not available and no data were collected for that product.

Data entry

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

- The USD ($) exchange rate on the first day of the data collection was entered into the International Reference Prices data page in the workbook.
- Medicine unit price data were entered in data consolidation pages for procurement, public and private the workbook automatically calculated the percent availability and median price ratio of each medicine. The workbook also generated summary data (mean % availability and medicine median MPR) for each sector.
- The daily wage (basic salary) of the lowest paid unskilled government worker was entered in Omani Rials (105/- OR) in the standard treatment affordability page of the workbook. The workbook automatically calculates the number of days wages required to purchase selected standard treatment course.

Analysis:

The WHO/HAI Excel workbook automatically consolidates, summarizes results, calculates availability, median price ratios along with the interquartile range (IQR; see below for explanation) and affordability. and the workbook also prints tables that serve as the basis of this report.

The availability of individual medicines is calculated as the percentage (%) of medicine outlets where the medicine was found. Mean (average) availability is also reported for the overall "basket" of medicines surveyed. The availability data only refers to the day of data collection at each particular facility and may not reflect average monthly or yearly availability of medicines at individual facilities.

International Reference Prices (IRP) and Median Price Ratio (MPR):

To facilitate cross-sector and cross-country comparisons, medicine prices obtained during the survey are expressed as ratios relative to a standard set of international reference prices (IRPs), these ratios are known as Median Price Ratios (MPRs).

$$\text{MPR} = \frac{\text{Median local unit price}}{\text{International reference unit price}}$$

The ratio is thus an expression of how much greater or less the local price is than the international reference price. e.g.

- If MPR = 1 would mean that the local medicine price is clearly close or equal to that of the international reference price.
- If MPR = 2 would mean that the local medicine price is twice that of the international reference price.
- If MPR = 1.2 would mean that the local medicine price is higher than that of the international reference price by 20%.
- If MPR = 0.8 would mean that the local medicine price is less than that of the international reference price by 20%.

Median price ratios were calculated using price data from at least 4 medicines outlets, except for procurement prices where a single data point was accepted. The exchange rate used to calculate the MPRs was 1 USD = 0.3870 OR (this was the "buy" rate on the first day of data collection taken from Oman International Bank (OIB)).

The reference prices used were the 2006 Management Sciences for Health (MSH) prices, taken from the International Drug Price Indicator Guide (MSH 2006). These reference prices are the medians of recent procurement prices offered by for-profit and not-for profit suppliers to international not-for-profit agencies for mostly generic products. These agencies typically sell in bulk quantity to governments or NGOs, and are therefore relatively low and represent efficient bulk procurement without costs of shipping or insurance.

(Note: in some cases, especially for medicines newly off patent for which there are few suppliers, buyer prices are used which may be relatively high, thus giving a relatively low MPR. In such cases, affordability is a better measure of the relative 'price'.

Interpreting the MPR:

In general,

- MOH/CMS procurement prices for the Lowest Priced Generic (LPG) should be fairly close to the MSH reference prices i.e. MPR= 1.00. The MPR for the OBmay be much higher, since the MSH prices are for generic equivalent form. The differences between the MPR for the OB and the MPR for the LPG is a measure of the "Brand Premium" paid for purchasing brand products.
- Private retail pharmacies prices for medicines are likely to be considerably higher. This is due to the charges and profits added on the factory price of the medicine as it proceeds through the distribution system. The extent to which these retail prices are higher depends on the country such as market size and penetration, competition and therapeutic alternatives, consumption, economies of scale, national wealth and wealth distribution, health system structure and accessibility, distribution and storage charges, local taxation and regulations.
- If a medicine is rarely used in any sector, the price differential is likely to be greater.

The median and the Inter Quartile Range (IQR):

Price results are presented for individual medicines, as well as for the overall "basket" of medicines surveyed. Summary results for the basket of medicines have been shown to provide a reasonable representation of medicines in the country and price conditions on the market. As averages can be skewed by outlying values, median values have been used in the price analysis as a better representation of the midpoint value. The magnitude of the price variations is presented as the interquartile range. A quartile is a percentile rank that divides a distribution into 4 equal parts. The range of values containing the central half of the observations, that is, the range between the 25^{th} and 75^{th} percentiles, is the interquartile range. Most people are familiar with the mean (average) of a set of values/data and the standard deviation (SD) as a measure of the variability of the data. The mean and the standard deviation are suitable for normally distributed data, but are sensitive to extreme values and therefore not appropriate when considering data which is skewed. In this instance, the median is better measure of the average value. It is the middlemost value in a set of data. The variability of non-normally distributed data (or non-Gaussian data) is commonly expressed as the interquartile range (IQR) - the range or differences between the 1^{st} and 3^{rd} quartiles (25^{th} and 75^{th} percentiles). By definition, 50% of all data points fall within the IQR. Medicine pricing data is often skewed and therefore the median and IQR are used in this survey methodology.

Affordability:

WHO/HAI methodology incorporates affordability calculations based on how many days' wages of the lowest paid unskilled government worker would be required to purchase standard or model treatments using the survey medicines. The affordability of treating 12 common conditions was assessed by comparing the total cost of medicines prescribed at a standard dose, to the daily wage of the lowest paid unskilled government worker as a basic monthly salary = 105/- OR equals around 271 USD (Source: Personnel Department - MOH). Though it is difficult to assess true affordability, treatments costing one days' wage or less (for a full course of treatment for an acute, condition, or a 30-day supply of medicines for chronic diseases) are generally considered affordable.

Price components:

Medicines are tax-free in Oman. The wholesaler and retail pharmacies mark ups are fixed by the MOH as an additional cost added to the approved CIF price of the medicines from its manufacturer. MOH applies price revisions for the retail prices in case of appreciation or depreciation of international currencies.

*Retail Price =CIF (local currency)*1.55*

Results:

1. Availability of medicines in the public sector:

Table 4. Mean availability (%) in public sector

Public sector (30 pharmacies)		
List	**Type of product**	**Mean availability**
All survey medicines list (the 42 medicines list)	brand	13.0 %
	generic	68.3 %
Global List	brand	7.1 %
	generic	65.0 %
Regional List	brand	19.8 %
	generic	59.4 %
Supplementary List	brand	10.6 %
	generic	84.2 %
Essential Medicines List (EML)	brand	14.4 %
	generic	75.4 %

Mean availability of medicines in the public sector on the day of data collection was good where availability of medicines in each list was as follows:

- Mean availability of Global list survey medicines in the public sector was 7.1% and 65.0% respectively for originator brands and lowest priced generics.
- Mean availability of Regional list survey medicines in the public sector for originator brand and generic medicines was 19.8% and 59.4 % respectively.
- Mean availability of Supplementary list survey medicines in the public sector for originator brand and generic medicines was 10.6% and 84.2 % respectively.
- Mean availability of medicines which are in the national EML (the list of approved medicines for MOH) was 14.4% and 75.4% for originator brand and generic medicines respectively.
- Mean availability of all 42 survey medicines in the public sector was 12.7% and 68.3% for originator brand and generic medicines respectively.

N.B. Some medicines within the 42 survey medicines, included specifically in the Global and Regional lists were of strengths which are not approved for use in MOH facilities e.g. amoxicillin capsules 500mg. amoxicillin suspension 250mg/5mL, ciprofloxacin 500mg tablets, metronidazole 200mg tablets. Therefore they were not available as individual medicines in the public sector. This partly explains why mean availability of generic medicines of both lists (Global & Regional) was relatively low (65% and 59%

respectively), resulting in the mean availability of all 42 survey medicines being 68% for generics. However, strengths of the above said medicines approved for use in MOH were also included in the survey in the supplementary list where availability of generic medicines was 84.2%, similar to that of those on the EML (MOH-approved list) at 75.4% - some medicines are only procured as OBs which is why this is not higher and some medicines are only available at hospitals or higher level centres which also explains the lower than expected availability. Thus, patients in this sector are not forced to purchase the medicine privately.

2. Availability of medicines in the private sector;

Table 5. Mean availability (%) in private sector

Private sector (32 pharmacies)		
List	**Type of product**	**Mean availability**
All survey medicines list (the 42 medicines list)	brand	50.6 %
	generic	55.3 %
Global List	brand	46.4 %
	generic	69 %
Regional List	brand	54.1 %
	generic	37.3 %
Supplementary List	brand	50.9 %
	generic	63.3 %
Essential Medicines List (EML)	brand	49.7 %
	generic	54.8 %

Mean availability of medicines in the private sector on the day of data collection was generally not good. The availability of medicines in each list was as follows:

- Mean availability of Global list survey medicines in the private sector was 46.4% and 69% for originator brand and generic medicines respectively.
- Mean availability of Regional list survey medicines in the private sector was 54.1% and 37.3% for originator brand and generic medicines respectively.
- Mean availability of Supplementary list survey medicines in the private sector was 50.9% and 63.3% for originator brand and generic medicines respectively.
- Mean availability of national EML (MOH approved list) medicines in the private sector was 49.7% and 54.8% for originator brand and generic medicines respectively.

- Mean availability of all 42 survey medicines in the private sector was 50.6% and 55.3% for originator brand and generic medicines respectively.
- In this sector, both originator brands and lowest priced generics were found with almost similar prevalence.

Table 6. Medicines with particularly low availability (private sector)

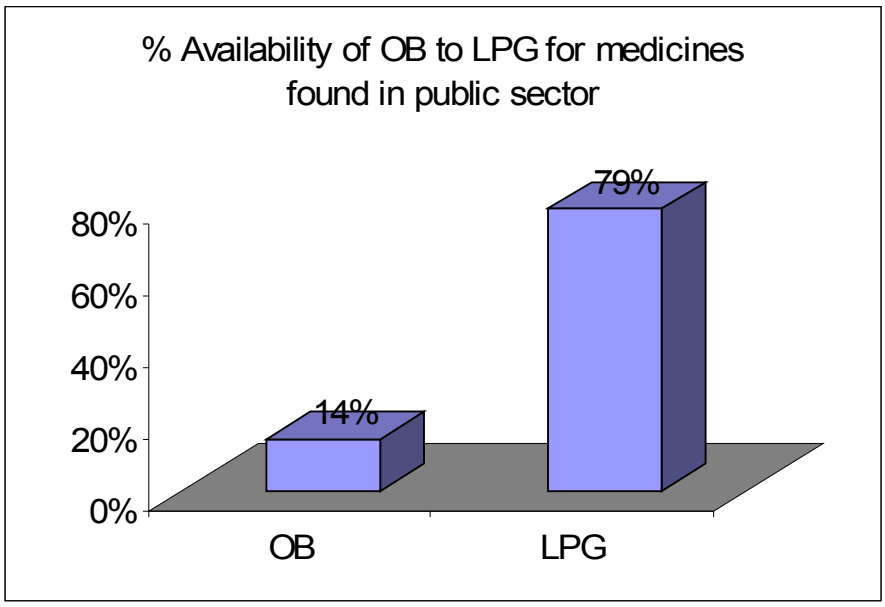
The following medicines were found to have a mean availability less than 50 % all over surveyed regions

SR.No	Medicine	List	Availability %	Justification
1	Atorvastatin	Regional	31.3	Low demand /Simvastatin has good availability
2	Beclometasone inhaler	Regional	31.3	Doctors prescribing habits
3	Captopril	Global	3.1	Low demand /lisinopril has good availability
4	Dexamethasone injection	Regional	15.6	For emergency use and it is available in clinics
5	Diazepam 5 mg tablets	Global	12.5	Controlled medicine as it is psychotropic therefore many pharmacies do not keep this medicine
6	Digoxin	Supplementary	21.9	The local agent was approached to clarify the reason for low availability of these 2 medicines. And they replied that there was no demand by the retail pharmacies although the medicines are available at the agents' warehouse on a regular basis. A meeting conducted with all agents and DGPA &DC has emphasized on the importance of these medicines and requested from agent and other retail pharmacies to make them available at all times.
7	Isosorbide dinitrate	Supplementary	15.6	

Annex 4 contains the availability of individual medicines in both public and private sectors.

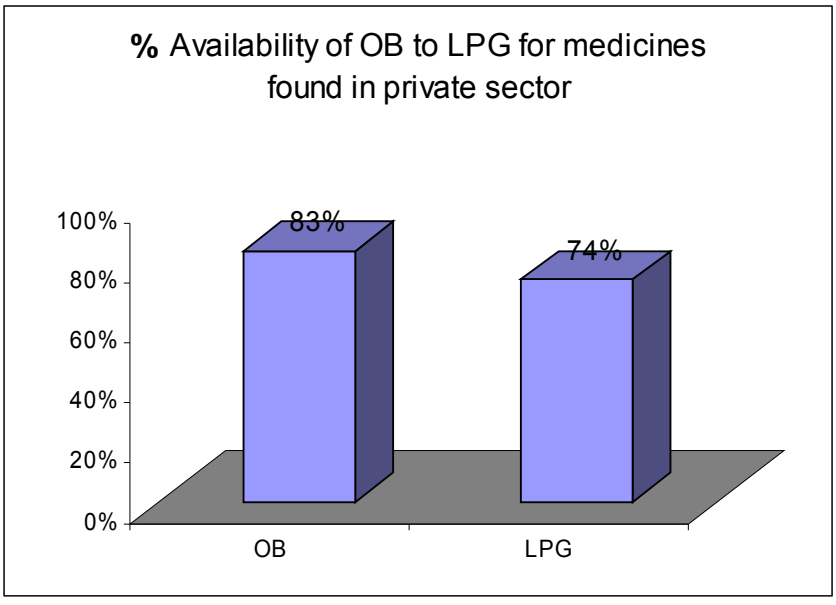
3. Availability of OB and Generics in both (public and private) sectors

Figure 3. Availability of originator brands and generics in the public sector,



Out of the 42 medicines included in the survey, 6 originator brands and 33 generics were found in the public sector; the public sector is therefore procuring and using predominantly generic products (Fig. 3).

Figure 4. Availability of originator brands and generics in the private sector



Out of the 42 medicines included in the survey, 35 were found as originator brands and 31 as generics in the private sector, indicating that both originator brands and lowest priced generics were found with similar prevalence.

4. **Public sector procurement prices:**

Table 7. Public sector procurement price as a ratio of MSH reference price (median price ratio or MPR), median for all medicines surveyed

List	Type of product	Median (MPR)	25th percentile	75th percentile	Minimum MPR	Maximum MPR
All survey medicines list the 42 medicines list)	brand	5.80	4.81	7.09	3.56	20.73
	generic	0.95	0.67	1.33	0.26	13.82
Global List	brand	4.57	4.57	4.57	4.57	4.57
	generic	0.88	0.69	1.28	0.52	13.82
Regional List	brand	5.8	5.03	9.75	3.56	20.73
	generic	1.11	0.42	1.18	0.26	8.67
Supplementary List	brand	7.43	7.43	7.43	7.43	7.43
	generic	0.95	0.73	1.52	0.34	4.49
Essential Medicines List (EML)	brand	5.80	4.81	7.09	3.56	20.73
	generic	0.95	0.67	1.33	0.26	13.82

- Based on the median MPRs results of all 42 survey medicines, the public sector is procuring generics at slightly lower than their international reference prices (median MPR=0.95), and originator brands at more than 5 times higher than their international reference prices (median MPR=5.8).
- Thus, the government procurement agency is generally purchasing efficiently. The interquartile range shows little variation in median price ratio across individual medicines.
- *Diazepam and albendazole has low demand which is according to the methodology that rarely used or low demand medicines are expected to have relatively higher prices than the MSH / international reference prices. However, these prices still appear remarkably high. Purchasing albendazole as OB also seems unnecessary even if it is a medicine with low demand.
- The MPR for the OB may be much higher, since their prices were compared to the MSH prices which are for usually for a generic equivalent form.

Table 8. Generic medicines being purchased at prices significantly less than international prices

Sr No.	Medicine	MPR
1	Co-amoxiclav tablets 375mg	0.34
2	Atenolol 50mg tablets	0.72
3	Beclometasone inhaler	0.45
4	Captopril tablets	0.62
6	Gliclazide tablets	0.68
7	Hyoscine N-Butyl bromide	0.79
8	Isosorbide dinitrate	0.67
9	Lisinopril	0.26
10	Metformin	0.39
11	ORS	0.71
12	Salbutamol syrup	0.55
13	Salbutamol inhaler	0.68

Table 9. Generic medicines for which the government is paying several times the international their international reference prices

Sr No.	Medicine	MPR
1	Acetylsalicylic acid	4.49
2	Chloramphenicol eye drops	3.59
3	*Diazepam tablets	13.82
4	Fluoxetine	8.67

Table 10. Brand medicines for which the government is paying several times the international reference prices

Sr No	Medicine	MPR
1	*Albendazole	20.73
2	Amitriptyline	4.57
3	Carbamazepine	5.52
4	Digoxin	7.43
5	Hyoscine n-butyl bromide	3.56
6	Nifedipine retard	6.08

5. Private sector prices:

Table 11. Private sector prices as a ratio of MSH reference price (median price ratio or MPR), median for all medicines surveyed

List	Type of product	Median (MPR)	25th percentile	75th percentile	Minimum MPR	Maximum MPR
List **All survey medicines list the 42 medicines list)**	Brand	22.44	11.51	47.35	1.60	156.28
	Generic	7.39	4.32	12.67	1.34	102.68
Global List	Brand	36.21	20.42	54.59	5.78	132.37
	Generic	12.64	7.79	16.27	1.81	35.96
Regional List	brand	22.44	12.08	37.23	2.53	156.28
	generic	7.39	3.37	10.96	2.01	102.68
Supplementary List	brand	13.49	4.15	18	1.60	102.96
	generic	5.58	4.61	6.64	1.34	19.88
Essential Medicines List (EML)	brand	18.75	9.35	47.35	1.60	156.28
	generic	8.51	3.81	13.01	1.34	102.68

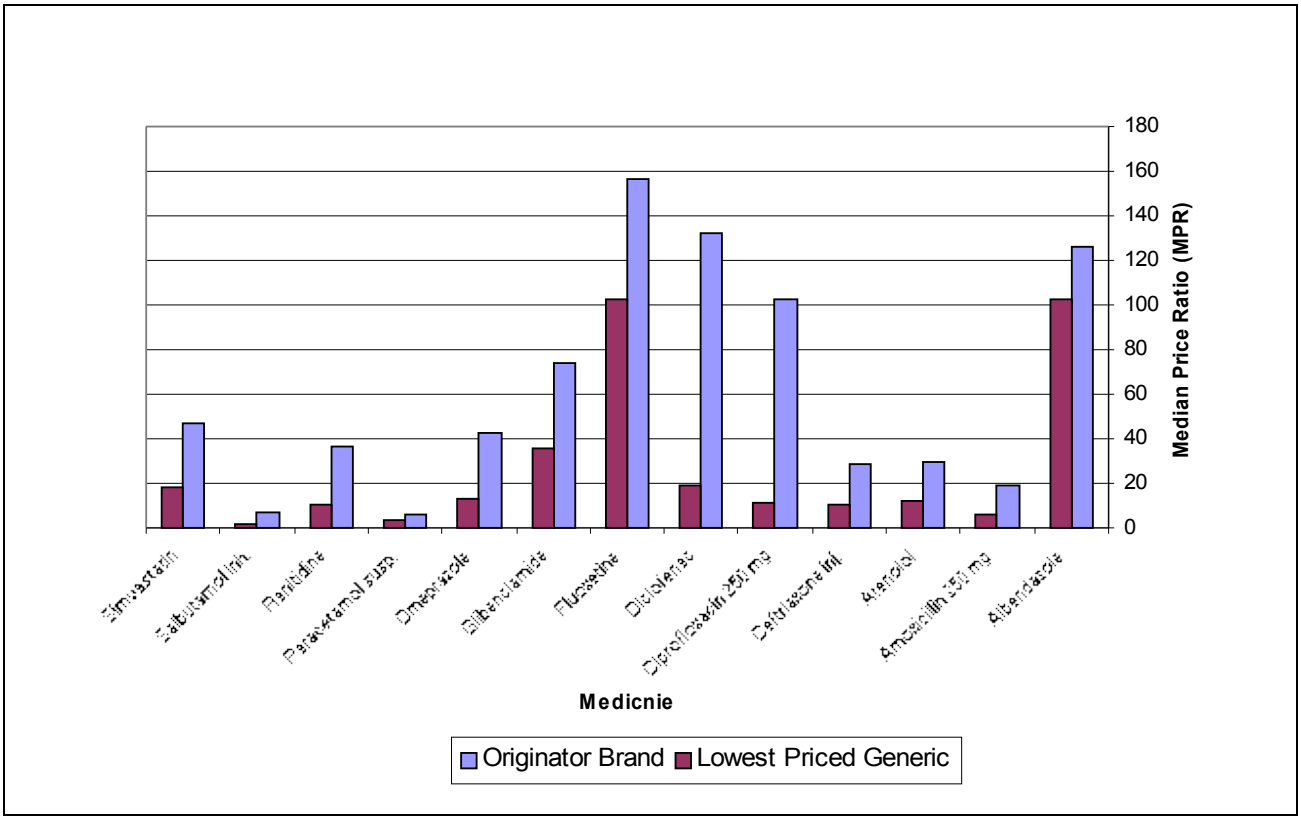
The results of the 42 medicines included in the survey show that in the private sector:

- Originator brand medicines are generally sold at 22.44 times their international reference price. Half of the originator brand medicines were priced at 11.51 to 47.35 times their international reference price; there is therefore moderate variation in MPRs across individual originator brand medicines in the private sector.
- Lowest price generic medicines are generally sold at 7.39 times their international reference price. Half of the lowest priced generic medicines were priced at 4.32 to 12.67 times their international reference price; there is therefore moderate variation in MPRs across generic medicines in the private sector.
- In general, private retail pharmacies prices for medicines are likely to be considerably higher than public procurement prices. This is due to the charges and profits added on the factory price of the medicine as it proceeds through the distribution system. The extent to which these retail prices are higher depends on the country and infrastructure such as market size and penetration, competition and therapeutic alternatives, consumption, economies of scale, national wealth and wealth distribution, health system structure and accessibility, distribution and storage charges. However, some prices appear very high with

MPRs more than 50 i.e. albendazole (OB, LPG), ciprofloxacin 250mg and 500mg (OB), diclofenac (OB), fluoxetine (OB, LPG), furosemide (OB), glibenclamide (OB), metronidazole 200mg,.

6. Comparison of the prices of originator brands and generically equivalent products: Median MPRs found in private sector as both product types

Figure 5. Prices of two product types (OB, LPG) of selected medicines, private sector.



- MPRs for selected medicines of which both the originator brand and a generically equivalent product were found were also included in the analysis to allow for the comparison of prices between two product types. The difference between the MPR for the OB and LPG is a measure of the "Brand Premium" paid for purchasing brand products. This is shown in the next section.
- Some medicines had both types of products available and priced extremely higher than international reference prices including albendazole (MPR 126.36 & 102.22 for OB and LPG respectively) and fluoxetine (MPR 156.28 & 102.68 for OB and LPG respectively).

Recommendation

Investigate why prices of these two generic products are much higher than MSH prices for similar generic equivalents**.**

To revise the prices of medicines of which their patents are expired.

Investigate why some OB prices (MPRs) are very high compared to others.

Annex 5 contains MPRs for individual medicines in public and private sectors.

7. Brand premium in private sector

Table 12. MPRs for those medicines available as both brand and generic in private sector

Type of product	Median (MPR)	25th percentile	75th percentile	Minimum MPR	Maximum MPR
Brand	22.44	11.61	55.09	3.15	156.28
Generic	10.05	4.65	12.64	1.34	102.68

- In the private sector, originator brands cost twice i.e. 100% more, on average, than their generic equivalents (median MPR 20.44 and 10.09 for originator brand and equivalent generic product, respectively giving a brand premium of 2.2 or 120%).

8. Comparison of medicines prices in private compared to public sector prices

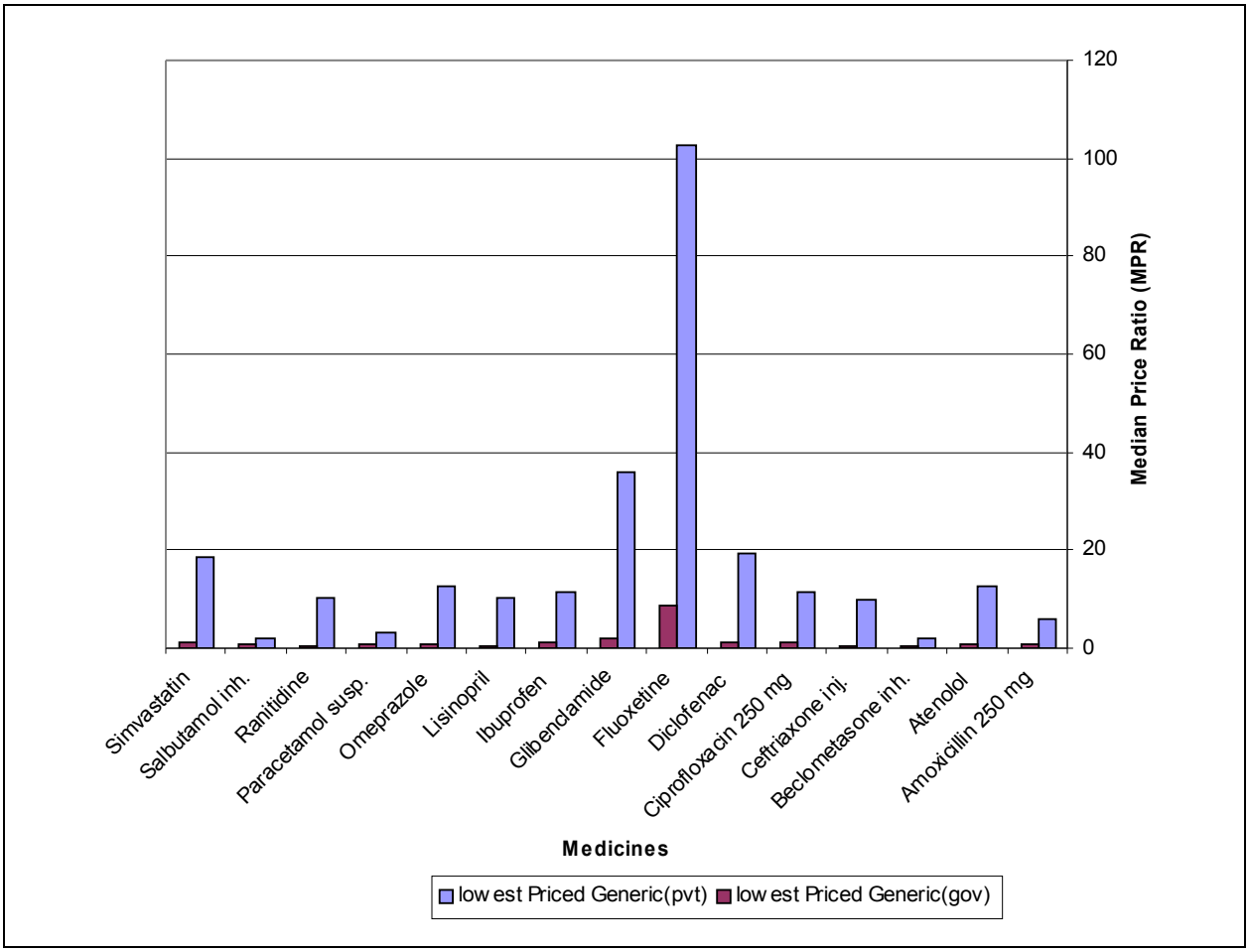
Only those medicines found in both public and private sector medicine outlets were also included in the analysis to allow for the comparison of prices between the two sectors

Table 13. Median MPRs for both types of products for all medicines found in both sectors

Type of product	Number of medicines found in both sectors	Public sector	Private sector	% difference private price to procurement price
brand	6	5.80	20.27	249.6
generic	27	0.93	6.97	646.4

Results of Median MPRs of 33 medicines (6 brands and 27 generics) found in both sectors for both OB and LPG show that final patient prices in the private sector are 249.6% higher than in the public sector for brands and 646.4% higher than the public sector for generic equivalents.

Figure 6. Median MPRs for selected generic medicines found in both public and private sectors



9. **Affordability of standard treatment regimens:**

Since the government supplies medicines for Omani patients for free, affordability was measured only if medicine was purchased from private sector. The affordability of treatment of 10 common conditions was estimated as the number of days' wages of the lowest paid unskilled government worker needed to purchase medications prescribed at a standard dose. For acute conditions, treatment duration was defined as a full course of therapy, while for chronic diseases, the affordability of a 30-days supply of medicines was determined. The daily wage of the lowest-paid unskilled government worker used in the analysis was based on a basic monthly salary = 105/- OR i.e. daily wage = 3.5 OR

Table 14. Days' wages of the lowest paid government worker needed to purchase standard treatments from private sector

Disease condition and standard treatment	Days' wages to pay for treatment

Condition	Medicine	Treatment course	OB	LPG
Asthma	Salbutamol inhaler 100 mcg/ dose	1 inhaler of 200 doses	1.4	0.3
	Beclometasone inhaler 0.05 mg/ dose	1 inhaler of 200 doses	NA	0.6
Diabetes	Glibenclamide 5mg tablets	1 tablet x 2 x 30 days= 60 tablets	1.8	0.9
	Gliclazide 80mg	1 tablet x 2 x 30days = 60 tablets	2.2	1.2
	Metformin 500mg	1 tablet x 2 x 30days = 60 tablets	0.5	0.3
Hypertension	Atenolol 50mg tablets	1 tablet x 30 days= 30 tablets	1.1	0.4
	Lisinopril 10mg tablets	1 tablet x 30 days= 30 tablets	2.7	2.3
	Nifedipine retard 20 mg tablets	1 cap. x 2 x 30 days= 60 caps.	4	NA
Hypercholesterol-aemia	Simvastatin 20mg tablets	1 tablet x 30 days= 30 tablets	8.5	3.3
	Atorvastatin 20 mg tablets	1 tablet x 30 days= 30 tablets	9	NA
Depression	Amitriptyline 25mg caps.	1 cap. x 3 x 30 days= 90 caps.	1.3	NA
	Fluoxetine 20mg tablets	1 cap. x 2 x 30 days= 90 caps.	15.8	10.4
Adult respiratory infection	Ciprofloxacin 500mg tablets	1 tablet x 2 x 7 days= 14 tablets	6.1	0.6
	Amoxicillin 500mg caps.	1 caps x 3 x 7 days= 21 caps.	0.8	0.4
Anxiety	Diazepam 5mg tablets	1 tablet x 7 days	0.2	NA
Arthritis	Diclofenac 50mg tablets	1 tablet x 2 x 30 days = 60 tablets	5	0.7
Pain/Inflammation child (1 year)	Paracetamol 24mg/mL suspension	120mg = (5mL) x 3 x 3 days = 45mL	0.1	0.1
Ulcer	Omeprazole 20mg tablets	1 tablet x 30days = 30 tablets	10.4	3.1
	Ranitidine 150 mg tablets	1 tablet x 2 x 30days = 30 tablets	5.7	1.6

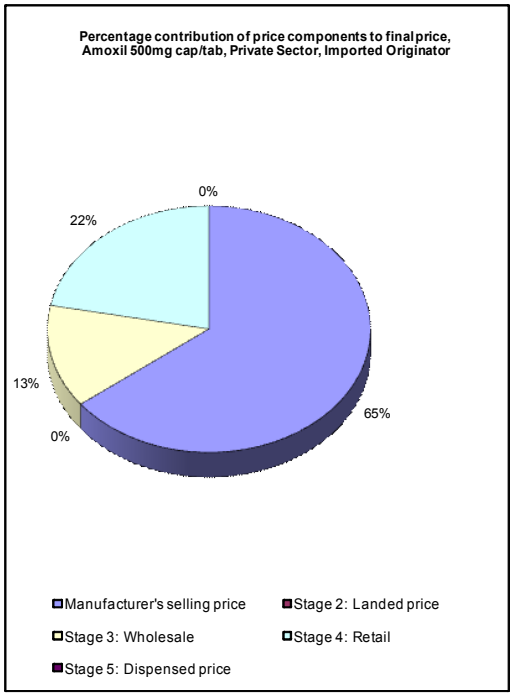
It should be noted that treatment costs refer to medicines only and do not include the additional costs of consultation and diagnostic tests. Further, even where individual treatments appear affordable, individuals .or families who need multiple medications may quickly face unmanageable drug costs

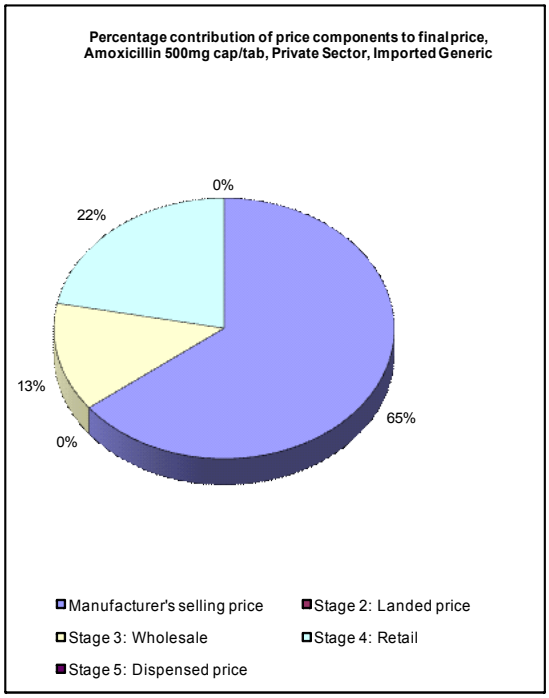
10. <u>Price components:</u>

Medicines are tax-free in Oman. The final medicine price to the patient is fixed by the MOH. 55% is added as additional costs to the manufacturer's selling CIF price for an imported medicine. Of the 55%, some goes

to the wholesaler (20.9% on the landed cost) and some to the retailer (28.1% on the wholesale cost). No variations are allowed in medicines prices in all regions in Oman*; Retail price (RP) = CIF (local currency)*1.55*. For locally produced generics the additional costs on CIF are fixed at 34%.

Figure 7. Percent contribution to final price of major price components.



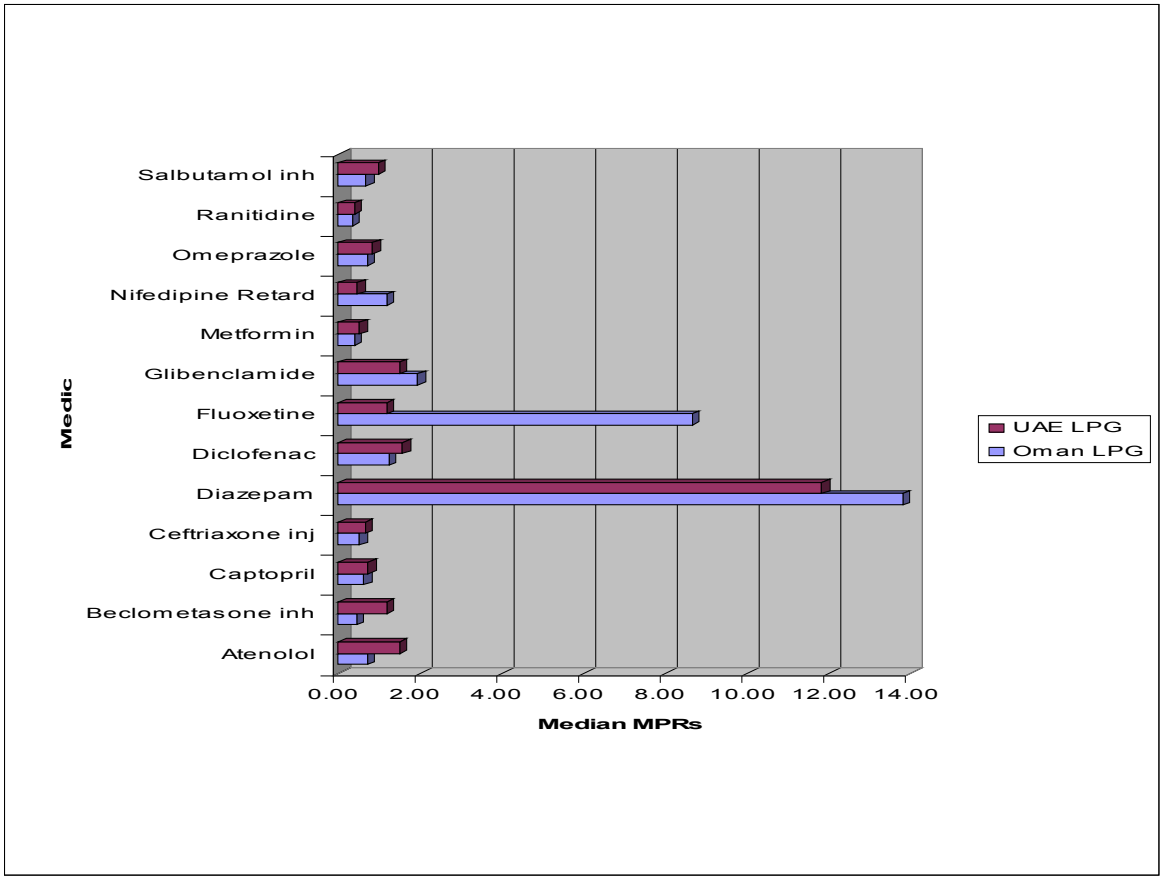


***N.B* Mark up was reduced from 70% to 55% in 2006 which is still higher than mark-ups in other neighboring countries(UAE 45%, KSA 34%)**

11. International comparisons

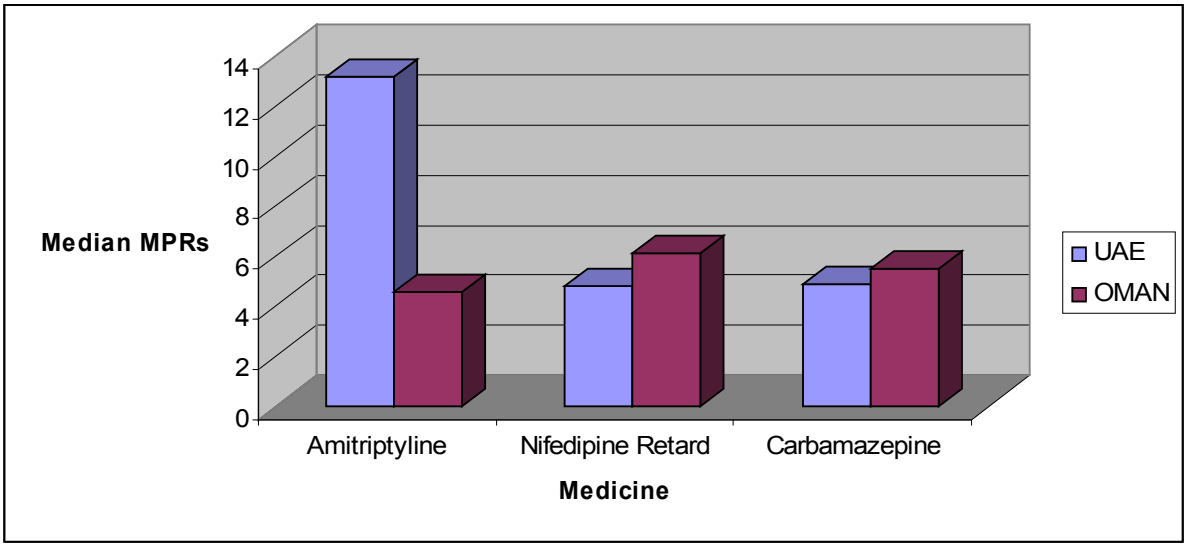
In every WHO/HAI survey, data is collected on the same core medicines with the same dosage forms and strengths, which allows for comparisons to be made across countries. The UAE and Kuwait were selected for international comparisons of the medicines price ratios and affordability found in this survey. Countries were selected based on similar in terms of economic wealth and development; of similar size in terms of population; similar in terms of health system structure. Some comparisons were also made with other national surveys. Countries survey data were obtained from the database of survey results available on the HAI website (http://www.haiweb.org/medicineprices). The surveys were conducted in different years using different MSH reference prices (Oman (MSH 2006), UAE (MSH 2005), Kuwait (MSH 2002) and were not adjusted for this or for the effects of inflation, or exchange rate fluctuations. However, on a gross level the .comparisons should still be valid

Figure 8. Comparison of procurement prices for LPG medicines found in Oman and UAE



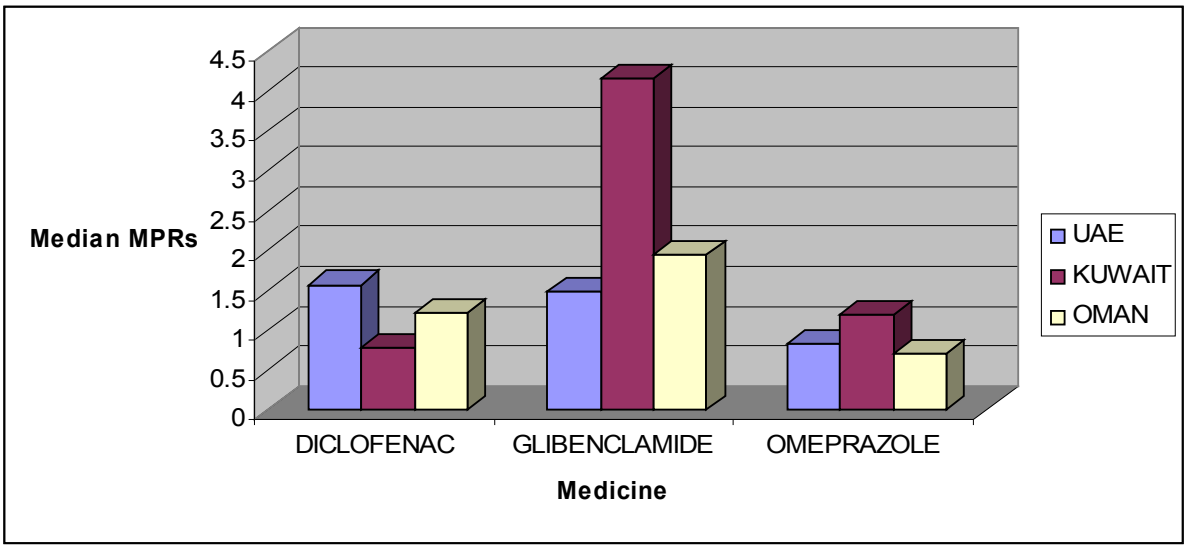
- Public procurement prices in Oman for LPG medicines found in both countries were similar to UAE prices in most cases.
- MPR for procurement of the LPG Fluoxetine is much higher than UAE price.

Figure 9. Comparison of procurement prices for OB medicines found in Oman and UAE



- Public procurement prices in Oman for OB medicines found in both countries were similar to UAE prices in the cases of nifedipine retard and carbamazepine (Fig. 9).
- Procurement MPR of the OB amitriptyline in Oman was much lower than UAE price.

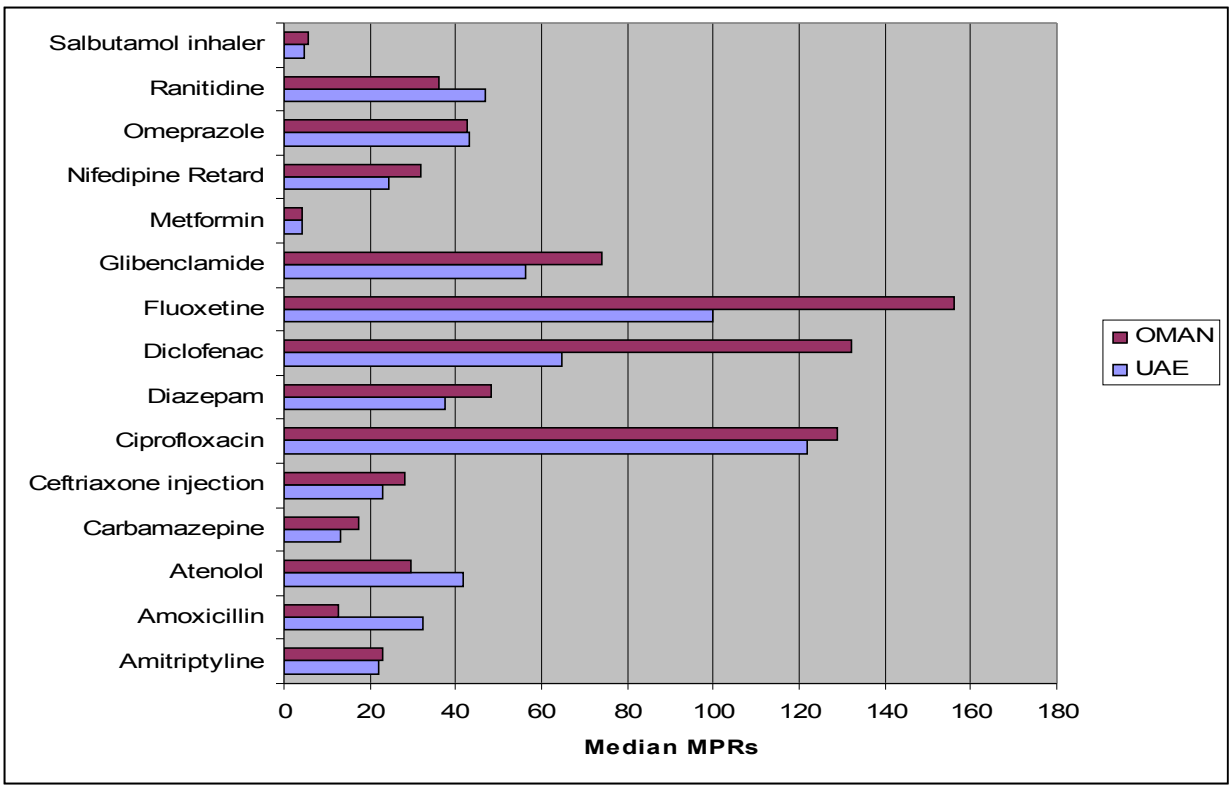
Figure 10. Comparison of procurement prices for LPG medicines found in 3 countries



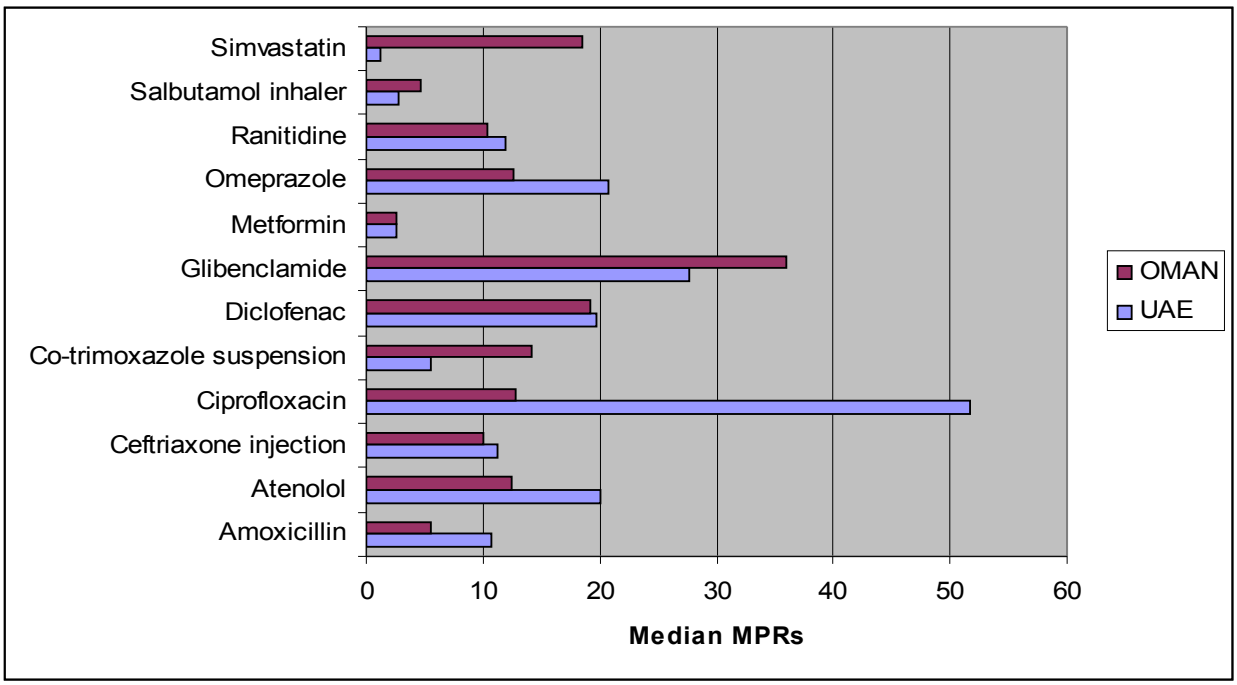
- A comparison of the public procurement prices of LPG diclofenac, glibenclamide and omeprazole in Oman, UAE and Kuwait (Fig. 10) showed that there could be substantial variation in procurement prices (up to 2-3 times difference).

International comparisons of private sector prices

(Figure 11. Comparison of OB medicines prices in private sector (Oman, UAE



(Figure 12. Comparison of LPG medicines prices in private sector (Oman, UAE



N.B **Prices for medicines in European currencies were revised (increased) due to the increase in their exchange rates which may have contributed to the prices of some medicines being higher than UAE**

Figure 13. Comparison of OB medicines prices in private sector in 6 countries

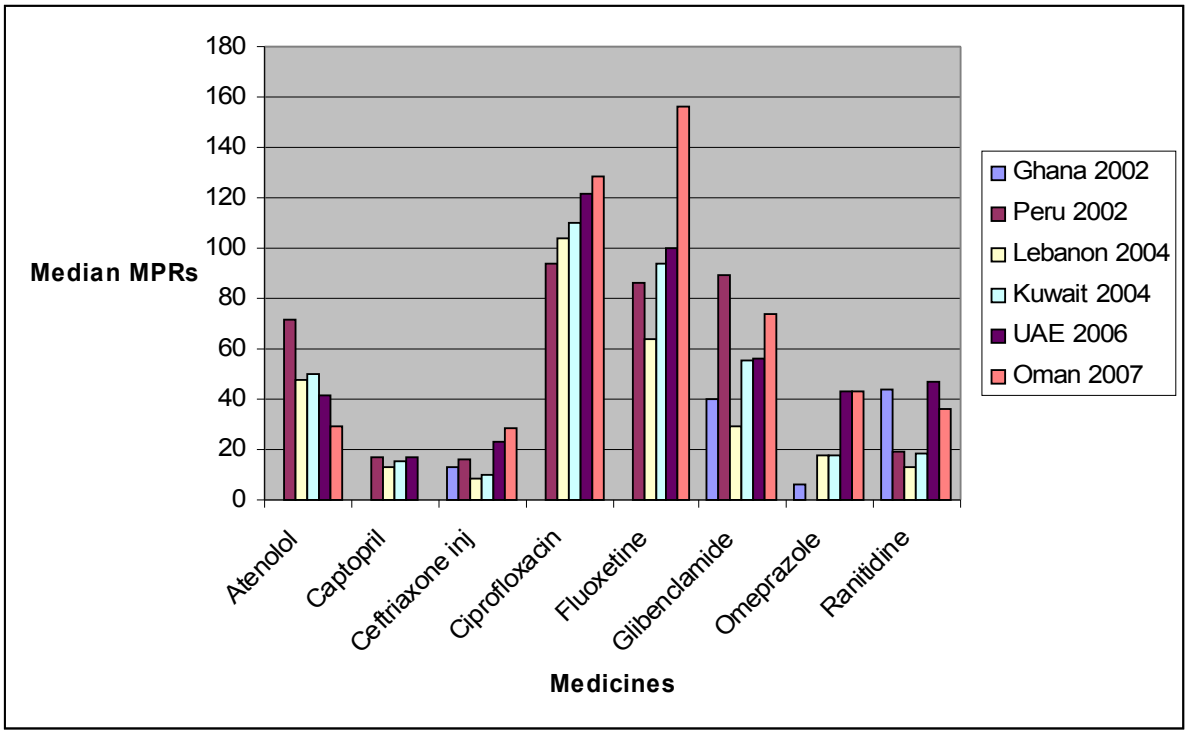
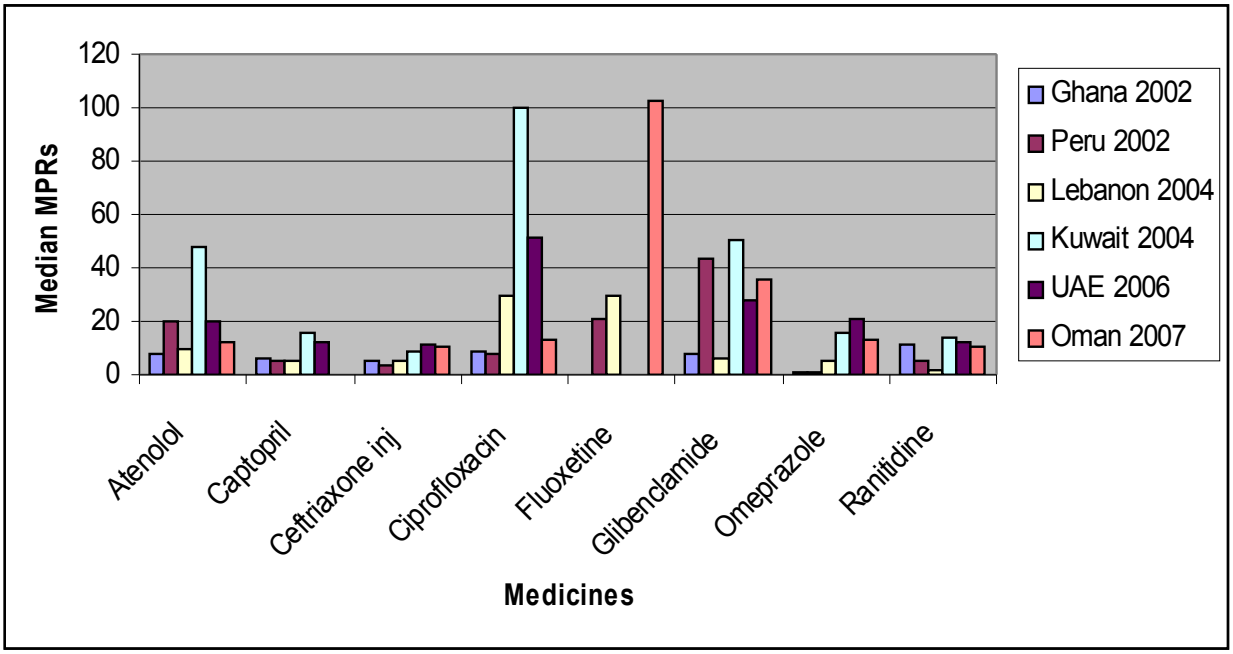


Figure 14. Comparison of LPG medicines prices in private sector in 6 countries



- From the comparison with 5 other countries, Oman appears to have competitively priced generic medicines but quite high prices for originator brands in the private sector.

International comparisons of private sector availability

Table 15. Private sector availability of selected medicines in 3 countries

Medicine	Product type	Oman	UAE	Kuwait
Ranitidine 150mg tablets	OB	53.1	100	92
	LPG	96.9	91.3	88
Glibenclamide 5mg tablets	OB	87.5	100	100
	LPG	93.8	95.7	44
Co-trimoxazole suspension	OB	0	100	0
	LPG	81.3	91.3	40

***N.B*. earlier surveys using the WHO/HAI methodology analysed availability across medicines using .median % availability, rather than mean % availability as now recommended by WHO/HAI**

Overall, the availability of medicines in Oman private sector ranks well compared to the other countries in .the comparison, particularly for generic medicines

International comparisons of private sector affordability

Table 16. Affordability, using originator brand medicines from private retail pharmacies, of common treatments to the lowest paid government worker for national medicine price surveys utilising the HAI/WHO methodology

	(Affordability (No. of days wages required					
	Country and survey date					
Condition	**Armenia 2001**	**Peru 2002**	**India 2003**	**Kuwait 2004**	**Lebanon 2004**	**Oman 2007**
Diabetes ((Glibenclamide	-	4.4	0.2	3.6	1.3	1.8
Asthma (Salbutamol (inhaler	2.6	**2.6**	**0.6**	**3**	**2.6**	**1.4**
Depression ((Amitriptyline	**-**	**6.4**	**1**	**2**	**6.4**	**1.3**
Hypertension ((Atenolol	**-**	**3.8**	**0.4**	**2.7**	**3.8**	**2.1**
Peptic ulcer ((Ranitidine	18.9	7.9	0.2	**17.8**	-	**5.7**

- The results of the international comparison suggest that Oman generally has good affordability, compared to the other countries included in the analysis. However, only originator brands are compared.

-

Compliance with pricing regulations:

The retail prices of the medicines in private sector were compared with the approved MOH official prices. No discrepancies were found between the approved ones and those found in pharmacies.

Conclusion and recommendations:

○

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

1. Maintain the efficiency of Central Medical Stores in public procurement. Where medicines are being procured at high MPR, to investigate reasons for this.
2. Issue lists of generics with low availability and give incentives for suppliers to make them available in private retail pharmacies.
3. To adopt pro-generic use policies (pharmacies to improve availability, improve patients awareness and to improve doctors prescribing habits)
4. Promote prescribing and use of medicines by generic name in public and private health sectors
5. To go forward with implementation of effective healthcare insurance plans to encompass all Oman residents.
6. Other living costs and expenses such as food, education, water, electricity bills, home rentals, etc to be incorporated or included in measurement of affordability of medicine
7. Carry out a more comprehensive HAI-based medicines prices survey to include other medicines and to compare them to neighbouring countries like UAE and KSA.
8. To reduce the medicines mark-up to be in line with what's been implemented by UAE (45%) and KSA (34%).
9. To identify medicines of high MPR, and re-price extremely high MPR medicines especially for those with available generics.
10. To carry out surveys to investigate reasons hindering generics from market penetration on all levels (Patient, Physician and other factors) to come up with more evidence-based approaches.

11. To carry out a survey on medicines prices for those medicines dispensed for inpatients in private hospitals. Then to come out with a pricing policy of medicines in this circumstance.
12. To encourage local pharmaceutical manufacturers to produce high demand medicines with competitive prices.

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

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