

Medicine prices in the State of Kuwait

Report of a survey on medicine prices in Kuwait

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Conflict of interest statement

None of the authors of this survey or anyone who had influence on the conduct, analysis or interpretation of the survey has any competing financial or other interests. The survey was conducted without external funding.

List of abbreviations used in the report

APC – Australian Productivity Commission

Cap – capsule

CIF – Cost, Insurance and Freight (also C&F)

CMS – Central Medical Stores

FOC – Free Of Charge

GCC – Gulf Cooperation Council

GDP – gross domestic product

HAI – Health Action International

IB – innovator brand

IMF – International Monetary Fund

Inh – inhaler

Inj - injection

IQR – interquartile range

KWD – Kuwaiti dinars

LPG – lowest priced generic equivalent

MPRG – Medicine Price Research Group

MPR – median price ratio

MSG – most sold generic equivalent

MSH – Management Sciences For Health

PBS – Pharmaceutical Benefits Scheme

Susp - suspension

Tab - tablet

USD – United States dollars (also \$)

WHO – World Health Organization

Notes

1. The generic names of medicines used in the report are their International Non-Proprietary Names (INN).
2. Mention of brand names of medicines is avoided in the text of the report. The corresponding brand names for the medicines may be found in the tables in the annexes.
3. When referring to the survey medicines in the text, often only the generic name of the medicine is used. It should be recognised that this implies the medicine in the exact strength and dosage form as required by the HAI/WHO methodology, and not necessarily to other forms and strengths.
4. When the term ‘brand’ is used in the text, it should be taken to mean the innovator brand.

Executive Summary

Background: A survey of the availability and prices of 35 medicines was undertaken in the public and private sector pharmacies in Kuwait in 2004 using the HAI/WHO medicines price survey methodology.

Methods: Public procurement prices were obtained from the Central Medical Stores (CMS) and 25 private retail pharmacies were surveyed for prices that the patient would pay. Availability of innovator brand (IB), most sold generic (MSG; generic product with the highest sales nationally) and lowest priced generic (LPG; generic product with the lowest price at each facility) equivalents was assessed in 25 public health facilities (5 general hospitals and 20 polyclinics) as well as the 25 private pharmacies.

Results: Central Medical Stores had over 90% availability of the survey medicines. Availability of the survey medicines at public health facilities on the day of the survey was low (IB 12%, MSG 0%, LPG 12%) but this was mostly related to the restricted distribution of many of the survey medicines within polyclinics. Innovator brands were more likely to be found in private retail pharmacies than generics (IB 84%, MSG 0%, LPG 0%).

The public procurement median price ratio (MPR) to MSH reference prices was 5.0 for IB and 1.2 for generic equivalents; in the private pharmacies, the median MPRs for IB, MSG and LPG were 18.3, 16.1, and 15.9 respectively. In private pharmacies, IB beclometasone inhaler had the lowest MPR (3.7) whereas IB ciprofloxacin had the highest MPR of 110. For medicines from private pharmacies, the median MPRs compared to Australian PBS prices were 1.7 (IB), 1.9 (MSG) and 1.9 (LPG). On average, MSG products were 87% of the price of the corresponding IB in private retail pharmacies.

The lowest paid government worker of Kuwaiti nationality would need between 0.1 and 3.8 days' pay to afford the model treatments (for example for gastric ulcer, hypertension and asthma) from private pharmacies. For non-Kuwaiti unskilled workers, however, the model treatments were generally not affordable and would require between 0.8 and 22.0 days' wages.

There was an error rate of 15.5% in the pricing of IB products compared to official price lists, with a tendency towards higher prices. Generic product pricing showed a similar error rate. However, there appeared to be no systematic attempts of overpricing on a product-wide basis. Private pharmacy medicines prices included a total mark-up of 70% over the CIF price based on 2004 drug prices.

Conclusions: Public sector procurement of medicines in Kuwait is effective and efficient although the reliance on some innovator brands does not seem necessary. Increased procurement of generics in the public sector could lead to more cost-effective utilisation of resources. Medicines prices in the private sector are almost twice those in Australian PBS reference prices, with a wide range between individual medicines. Limited generic penetration of the market means some medicines would be unaffordable to low-paid non-Kuwaiti workers if they had to purchase them from private retail pharmacies. When generic pharmaceuticals are available they are often priced only 10-15% below the innovator brand price due to lack of competition and the pricing regulation system. Increased availability of low-cost generic medicines in the private retail pharmacies e.g. through taking advantage of the public sector procurement system, could result in dramatic reduction in out-of-pocket pharmaceutical expenses to patients who need to purchase medicines from the private sector.

What we learn from this study

- Kuwait's public procurement of medicines is very efficient
- Prices of medicines from private pharmacies in Kuwait are comparable to some developing country markets
- Generic medicines are overpriced with little price differential between innovator brand and generic medicines in Kuwait
- Affordability of model treatments using survey medicines is comparable to some developing countries

موجز عن الدراسة

خلفية الدراسة: تم القيام بمسح تفصيلي لتوافر وأسعار 35 صنفاً من الأدوية في صيدليات القطاعين العام والخاص في الكويت في العام 2004 وذلك باستخدام المنهج البحثي في دراسة أسعار الأدوية الخاص بمنظمتي الصحة العالمية WHO و الدولية للعمل الصحي HAI.

طرق ومنهج البحث: تم الحصول على أسعار الشراء الحكومية Public procurement prices من إدارة المستودعات الطبية CMS ، كما تم عمل دراسة مسحية لعدد 25 صيدلية في القطاع الأهلي (الخاص) لمعرفة الأسعار التي سيدفعها المريض ثمناً لدوائه. وقد قام الباحثون بتقييم مدى توفر الأدوية ذات الأسماء التجارية من الشركات المبتكرة لها (الاسم التجاري أو IB) ، ومعادلاتها من أكثر الأدوية الجينية (المماثلة) مبيعاً MSG على المستوى المحلي وكذا أدنى الأدوية الجينية (المماثلة) سعراً LPG ، وذلك في 25 من مرافق تقديم الخدمات الصحية الحكومية (تتضمن 5 مستشفيات عامة و 20 مركزاً من مراكز الرعاية الصحية الأولية) ، بالإضافة لعدد 25 من صيدليات القطاع الأهلي (الخاص).

نتائج الدراسة: وجد الباحثون أن ما يزيد على 90% من الأدوية التي مسحت بهذه الدراسة كانت متوفرة في المستودعات الطبية المركزية CMS بشكل إجمالي ، أما بالنسبة لتوفر تلك القائمة من الأدوية الرئيسية بمرافق تقديم الخدمات الصحية الحكومية في اليوم الذي تمت به عملية المسح فقد كان منخفضاً (الاسم المملوك للشركة المبتكرة للدواء (أي التي تحمل أسماء تجارية أو ال-IB) في حدود ال-12% ، المكافئ الجينيس الأعلى الأكثر مبيعاً MSG فكان 0% ، أما المكافئ الجينيس الأرخص سعراً LPG فقد كان 12%). وبدرجة كبيرة يمكن أن يعزى سبب هذا النقص في توافر الأدوية الرئيسية لقيود وضوابط التوزيع لكثير من الأدوية التي تم مسحها على مراكز الرعاية الصحية الأولية . وفي المقابل ، فقد بينت الدراسة أن الأدوية ذات الأسماء التجارية IB كانت أكثر توفراً في صيدليات القطاع الأهلي (الخاص) مقارنة بالأدوية الجينية (الأدوية التي تحمل أسماء تجارية أو ال-IB كانت 84% ، المكافئ الجينيس الأكثر مبيعاً MSG كان 0% ، وكذا بالنسبة للمكافئ الجينيس الأرخص سعراً LPG والذي كان 0% أيضاً).

وبالرجوع إلى القطاع العام ، فقد توصلت الدراسة إلى أن متوسط نسبة أسعار الشراء MPR إلى الأسعار المرجعية للعلوم الإدارية من أجل الصحة MSH كان 5.0 لاسم المملوك للشركة المبتكرة للدواء (الاسم التجاري أو ال-IB) وكان 1.2 للمكافئ الجينيس . أما بالنسبة لصيدليات القطاع الأهلي (الخاص) ، فإن متوسط نسبة أسعار الشراء MPR لاسم المملوك للشركة المبتكرة للدواء (الاسم التجاري أو ال-IB) كان 18.3 ، أما بالنسبة للمكافئ الجينيس الأكثر مبيعاً MSG فقد كان 16.1 ، و للمكافئ الجينيس الأرخص سعراً LPG فكان 15.9 . وعلى سبيل المثال ، ففي الصيدليات الأهلية (الخاصة) وجد أن الاسم التجاري أو ال-IB لعبوة استنشاق بيكلوميثازون beclometasone كانت الأدنى (3.7) عند قياس متوسط نسبة أسعار الشراء MPR في حين أن الاسم التجاري أو ال-IB لدواء سيبروفلوكساسين ciprofloxacin كانت الأعلى (110) عند قياس متوسط نسبة أسعار الشراء MPR . كما وجد بالنسبة للأدوية في الصيدليات الأهلية (الخاصة) أن المتوسط لمتوسط نسبة أسعار الشراء MPRs مقارنة بأسعار مخططات الإعانات الدوائية PBS الأسترالية كان كما يلي: 1.7 لاسم التجاري أو ال-IB ، 1.9 للمكافئ الجينيس الأكثر مبيعاً أو ال-MSG ، وكذا 1.9 للمكافئ الجينيس الأرخص سعراً أو ال-LPG . وفي المعدل ، فقد بينت الدراسة أن المكافئ الجينيس الأكثر مبيعاً أو ال-MSG يصل إلى 87% من تسعيرة الاسم التجاري المقابل أو ال-IB في صيدليات القطاع الأهلي (الخاص).

وقد وجدت هذه الدراسة أيضاً أن الموظف الحكومي الكويتي الجنسية الذي يتقاضى أدنى الرواتب قد يضطر لدفع ما يعادل أجر 0.1 إلى 3.8 يوم من راتبه نظير شراء أحد العلاجات النموذجية التي توصف لعلاج بعض الأمراض الشائعة (مثل: التقرحات المعدية ، ارتفاع ضغط الدم ، أو داء الربو) وذلك إذا ما رغب في الحصول عليها من صيدليات القطاع الأهلي (الخاص) . أما الحال بالنسبة لأقل مراتب العمالة غير الماهرة من غير الكويتيين ، فإنه قد يصعب عليها الحصول على بعض العلاجات النموذجية لبعض الأمراض الشائعة بشكل عام وقد يتطلب الحصول عليها بذل أجر ما بين 0.8 و 22 يوم .

وقد بيّنت الدراسة أنّ معدل الخطأ Error rate في تسعيرة المنتجات التي تحمل أسماء تجارية أو الـ IB مقارنة بقوائم الأسعار الرسمية كان في حدود الـ 15.5% من الحالات التي تمّ مسحها ، مع ملاحظة أنّ معظم تلك الأخطاء كانت تميل إلى تقدير أسعار أعلى للأدوية عمّا هو مذكور في قوائم أسعار الأدوية الرسمية. هذا وقد أظهرت أسعار المنتجات الجنيصة معدل خطأ مماثل . ومع ذلك ، فقد بيّنت الدراسة المسحية التي تمّ القيام بها عدم وجود محاولات منظّمة أو مقصودة – على مستوى واسع - للمبالغة في تسعيرة المنتجات الدوائية . هذا وينبغي ملاحظة أنّ أسعار الأدوية في صيدليات القطاع الأهلي (الخاص) تتضمن إجمالي زيادة في القيمة بنسبة 70% فوق سعر الاستيراد (سعر مبيع المصنّع زائد تكاليف التأمين والشحن) أو الـ CIF حسب التسعيرة الرسمية التي كان يُعمل بها حتى نهاية العام 2004.

استنتاجات الدراسة: يتضح من الدراسة أنّ نظام شراء الأدوية في القطاع الحكومي في الكويت نظام مُحكم وشديد الفعاليّة ، بالرغم من أنّ الاعتماد الحاصل على بعض الأسماء التجارية للشركات المبتكرة للدواء أو الـ IB قد لا يبدو ضرورياً ، كما ينبغي تأكيد الاهتمام بالتركيز على شراء الأدوية الجنيصة والذي قد يؤدي بالضرورة إلى ارتفاع أجدى وذلك بتوفير أكبر لموارد القطاع الحكومي الماليّة . وقد وجدت الدراسة أنّ أسعار الأدوية في القطاع الأهلي (الخاص) في الكويت تصل أحياناً إلى الضعف مقارنة بأسعار مرجع مخطّطات الإعانات الدوائية PBS الأسترالية ، مع وجود فرق واسع في التسعيرة بين العلاجات المختلفة .

وقد تؤدي المحدوديّة وعدم التنوّع في سوق الأدوية الجنيصة في أنّ لا تكون بعض تلك الأدوية متاحة للعمالة الرخيصة من غير الكويتيين إن اضطرت لشرائها من صيدليات القطاع الأهلي (الخاص) . وبالإضافة إلى ذلك ، فقد وجدت الدراسة أنّه إن توفرت المستحضرات الصيدلانية الجنيصة في صيدليات القطاع الأهلي فإنّها غالباً تسعّر بفارق لا يتجاوز 10 إلى 15% أدنى من تسعيرة الأدوية المقابلة ذات الأسماء التجارية وذلك بسبب الافتقار للمنافسة التجارية وبسبب أنظمة وقوانين التسعيرة المعمول بها . إنّ زيادة توافر الأدوية الجنيصة الرخيصة الثمن في صيدليات القطاع الأهلي أو الخاص (وعلى سبيل المثال من خلال الاستفادة من نظام الشراء في القطاع الحكومي) قد يؤدي إلى انخفاض كبير في المبالغ التي قد يضطر أن ينفقها المرضى من جيوبهم الخاص للحصول على علاجاتهم من صيدليات ذلك القطاع .

CMS: Central Medical Stores
 IB: Availability of innovator brand
 MSG: Most sold generic
 LPG: Lowest priced generic
 MPR: Procurement median price ratio
 MSH: Management Science for Health
 Australian PBS: Pharmaceutical Benefit Scheme (Australia)
 CIF: Cost, insurance and freight

ماذا نتعلم من هذه الدراسة؟

- نظام الشراء الحكومي للأدوية في الكويت نظام فعّال جداً
- هناك تقارب بين أسعار الأدوية في صيدليات القطاع الأهلي (الخاص) في الكويت إذا ما قورنت بأسعار الأدوية في بعض البلدان النامية
- وجود مغالاة في تسعيرة الأدوية الجنيصة في الكويت ، بالإضافة إلى أنّ الفارق في التسعيرة بين الأدوية ذات الأسماء التجارية وتلك التي تقابلها من الأدوية الجنيصة في الكويت يعتبر فارقاً بسيطاً
- أظهرت الدراسة المسحية أنّ النماذج العلاجيّة المتوفرة يمكن مقارنتها بتلك التي نجدها في بعض البلدان النامية

1. Introduction and background

There has been growing public concern about the price of medicines in the private sector in Kuwait (Anon 2004a-f). With the launch of the standardised methodology for measuring the prices of medicines by Health Action International (HAI) and the World Health Organization (WHO) in 2003, a plan to conduct a local medicine price survey was formulated. Data collection was carried out in March (public sector prices) and July (private sector prices) 2004 with the aim of documenting the availability and prices of medicines in Kuwait so as to allow comparisons both within the country and with other countries. The study was conducted by the Medicine Price Research Group (MPRG) within the Department of Pharmacy Practice, Faculty of Pharmacy, Kuwait University, in collaboration with the Pharmacy Services Directorate of the Ministry of Health.

The survey was carried out using the methodology described in the manual '*Medicine prices: a new approach to measurement*' (HAI/WHO 2003) using a list of 35 medicines. The objectives of the study were to address the following questions:

- How efficient is the public sector medicine procurement system in terms of obtaining medicines at low cost for the country?
- What is the relative availability of innovator brand products and generic equivalents in 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?
- What pricing mechanisms and tariffs exist for medicines in Kuwait?

The Undersecretary for Health provided permission to approach the relevant persons and departments within the Ministry of Health in order to conduct the study.

Country data and health system description

Kuwait background

Kuwait is an emirate of 17,820 sq. km situated at the apex of the Arabian Gulf between Iraq and the Kingdom of Saudi Arabia. The country has a population of approximately two and a quarter million (of which 45% are nationals of Kuwait and the remainder mostly expatriate labourers and their families), most of whom reside within the urbanised area in and around Kuwait City. Kuwait possesses about 10% of world reserves of crude oil. As a result of the exploitation of petroleum resources, the country has a per capita GDP of US\$ 16,240 (PPP 2002 estimate; UNDP 2004). The currency is the Kuwait Dinar (KWD), made up of 1,000 fils, which is maintained at a controlled exchange rate with the United States Dollar (USD or \$). At the time of the survey, the exchange rate was KWD 1 = USD 3.39236 (www.oanda.com, 3 June 2004). Total annual pharmaceutical expenditure is about USD 200 million (Strategis 2001), approximately 10% of Gulf Cooperation Council (GCC) expenditure on medicines (WHO 2004).

Kuwait Health System

Kuwait has a well developed public health system with universal health insurance coverage arranged through employers or 'sponsors' for non-citizens. The structure of the public health system can be described by a tertiary model being composed of primary care polyclinics, specialised polyclinics, general and specialised hospitals. Some polyclinics are designated as family health centres and others offer 'specialised' services such as diabetes, hypertension,

dermatology, paediatric or obstetrics and gynaecology services. The health services in the State of Kuwait are divided into six health regions namely, Al-'Aasimah (Capital), Al-Jahra, Hawally, Al-Farwaniyah, Mubarak Al-Kabeer, and Al-Ahmadi governates. Each health region, apart from the relatively new Mubarak Al-Kabeer governate, has a number of polyclinics and a general hospital. Specialised hospitals are grouped together in a hospital suburb and include maternity, chest disease, orthopaedic, cancer, dermatology, psychiatric, specialised surgery, infectious disease and rehabilitation centres. There are also separate military and police medical facilities.

The national network of public health facilities is complemented by private retail pharmacies and private clinics and hospitals for those who do not feel their needs are adequately addressed by government facilities and/or who require treatments, medicines or brands which are not provided in the public health sector. There are a number of private hospitals and clinics of varying size and also over 200 private retail pharmacies, most of which are independent, with about 20% belonging to three main chains.

Pharmaceutical regulation and control in Kuwait

There is an established medicines regulatory authority in Kuwait, backed up by an effective quality control laboratory and only registered medicines may be prescribed or sold in the country. There is no formal National Medicines Policy document, but there is a national public sector medicines list used for procurement, and only certain medicines are made available at polyclinic level. The public sector medicine list is determined by administrators at the government Central Medical Stores (CMS) in collaboration with Ministry of Health expert committees appointed from consultants within a particular field e.g. dermatology. The CMS procures medicines largely through competitive tenders and the GCC bulk purchasing scheme, although the pharmaceutical products must be registered in Kuwait or at least two GCC states. There is no special dispensation for local or regional manufacturers with the winning bid usually going to the lowest, although appropriate financial allowance is made if additional desired medicines are provided free of charge (FOC) in the tender. Public sector medicines are distributed to health centres from the CMS. In the private sector, medicines are imported through registered pharmaceutical agencies, the larger ones of which usually represent a number of multinational pharmaceutical companies and, possibly, some generic manufacturers. Private retail pharmacies order directly from the agent with no other intermediary. There is a single pharmaceutical manufacturing company in Kuwait which produces generic products, some under licensing agreements with international firms.

Citizens of Kuwait receive free treatment in the public health sector while non-citizens pay a nominal user fee for a consultation (currently KWD 1 [about \$3.50] at primary level and KWD 2 [about \$7] at hospitals). Non-citizens also have to pay for some tests and examinations e.g. X-rays, unless it is an emergency or part of hospital in-patient care. The user fee covers any medicines prescribed from the public medicines list, apart from a restricted list of medicines which, for outpatients, are only provided to Kuwaiti citizens or citizens of the Gulf Co-operation Council (GCC) states who are resident in Kuwait (often referred to as 'Circular 365' or the 'Circular List' or 'Kuwaiti-only list'). Medicines on the Circular List comprise about 70 different active ingredients. Medicines are generally only dispensed in the public sector on the basis of a valid prescription by a medical practitioner. If a medicine is required which is not available in the public sector (or if it is a Circular List medicine required by a non-Kuwaiti outpatient), the patient must purchase it from a private pharmacy. A policy of generic substitution exists in the public sector pharmacies where, if a generic medicine is present in the pharmacy and not the prescribed brand product, the generic medicine should be dispensed. However, there are no incentives for generic prescribing or dispensing in general. Doctors are not permitted to dispense or sell medicines.

Most medicines for minor and chronic diseases are available without a prescription in the private sector – prescriptions are required for psychotropic and narcotic preparations, corticosteroids, antibiotics and a list of other specified medicines. Retail prices are set by the government and the price must be displayed on the outer packaging or container of the product. Failure to comply with the set price carries a penalty of up to KWD 2,000 [\$6,800] or up to 6 months in jail (State of Kuwait 1996) and could lead to withdrawal of the pharmacist's licence. Further details of the health sector are captured in the National Pharmaceutical Sector Form in Annex 1.

Medical and Pharmacy education

A large proportion of Kuwait's medical and paramedical workforce is composed of expatriates. However, there are long-term plans to train citizens to fill gaps within the health sector and to eventually replace most expatriate staff. In line with these plans, a medical school was established under Kuwait University in 1973 and currently produces approximately 80 graduates per year. Faculties of Dentistry and Pharmacy were formally established in 1996 and each graduate between 30 to 40 students annually.

The Medicine Price Research Group (MPRG) is an informal group of academics within the Faculty of Pharmacy, including one member from the Pharmacy Services Administration, Ministry of Health which was established to examine the pricing of pharmaceuticals in Kuwait, in particular using the HAI/WHO methodology. The authors of this report were involved in the main design and conduct of the survey with other members of the MPRG contributing in various ways throughout the study.

2. Methods

The MPRG undertook to survey the prices of medicines in the public sector and the private retail pharmacies using the HAI/WHO methodology (HAI/WHO 2004). A total of 35 medicines were sampled – 21 from the core list in the survey manual and 14 supplementary medicines. The reasons for exclusion and inclusion are described later.

For each substance, up to three products were monitored, namely:

- Innovator brand (IB) – the original patented pharmaceutical product
- Most sold generic equivalent (MSG) – the one with the highest sales on a national basis
- Lowest price generic equivalent (LPG) – the lowest priced in the facility at the time of survey

Public sector procurement prices (landed CIF price) were obtained centrally from the Central Medical Stores of the Ministry of Health. Private sector procurement prices were determined by back calculation from published official prices based on the pricing formula used for price regulation. Public sector pharmacies were only surveyed for the availability of the survey medicines since patients do not pay for medicines in public health facilities. Private sector pharmacies were surveyed on both availability and the displayed price of the medicine which the patient would pay and their selection is described below.

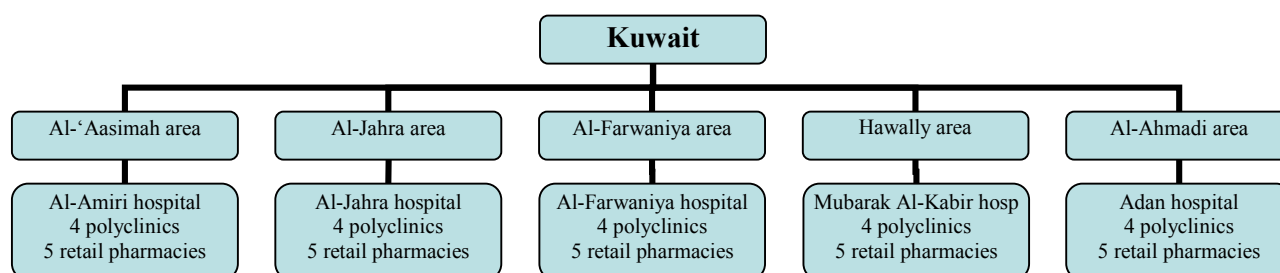
2.1 Sampling

Kuwait is a small country with an essentially urban population situated in a largely contiguous urban area. The five health regions or governates (Al-‘Aasimah [Capital], Al-Jahra, Hawally, Al- Farwaniyah, Al-Ahmadi) were selected as clusters on which to base the HAI/WHO sample selection methodology (Mubarak Al-Kabeer governate was excluded since it was newly established and lacks a fully developed health infrastructure). This sample essentially covered the whole of the State of Kuwait.

The public general hospital in each of the health regions was taken as the centre of sample selection in that area (Al-Amiri Hospital, Al-Jahra Hospital, Al-Farwaniyah Hospital, Mubarak Al-Kabeer Hospital, Adan Hospital). Four public primary care polyclinics around each hospital were randomly selected from a list of polyclinics in the same health region. The closest retail pharmacy to the hospital and each polyclinic was then selected giving five retail pharmacies per health region (see Figure 1). Thus a total of 5 public hospitals, 20 public polyclinics and 25 private retail pharmacies were included in the sample.

On advice from the Pharmaceutical Services Administration of the Ministry of Health, the polyclinics were selected from a list they provided which included only larger, permanent polyclinics and excluded those of limited function or very small size. Both general and specialised polyclinics were included on this list.

Figure 1. Schematic diagram depicting sample selection in Kuwait



2.2 The list of medicines

The HAI/WHO manual provides a core list of 30 medicines. However, some core medicines were removed from the survey based on restricted availability in Kuwait. The reasons for the restricted availability and the medicines affected are described below:

- ❑ Public sector supply restricted to Infectious Diseases Hospital; not likely to be stocked in private pharmacies:
 - Artenuate tab 100mg
 - Indinavir cap 400mg
 - Nevirapine tab 200mg
 - Pyrimethamine with sulfadoxine tab (25+500)mg
 - Zidovudine cap 100mg
- ❑ Not registered in Kuwait:
 - Fluconazole cap/tab 200mg (only 50mg or 150mg strengths are registered)
- ❑ Public sector supply restricted to Psychiatric Hospital; not likely to be stocked in private pharmacies:
 - Fluphenazine decanoate inj. 25mg/ml
- ❑ Not available in the public sector
 - Losartan tab 50mg
 - Lovastatin tab 20mg

The core medicines remaining in the survey are shown in Table 1.

Supplementary medicines were chosen by the MPRG based on the following criteria:

- Some to be chosen to 'replace' core medicines which had been excluded
- They should be used to treat prevalent diseases in Kuwait
- They should have an expected high level of use
- They should preferably be no longer under patent i.e. generic equivalents should be internationally available
- Some restricted products from the Circular List should be included whilst some should be available across all levels of care
- They should be listed on the Australian Pharmaceutical Benefits Scheme (PBS) since this was to be used to obtain reference prices for supplementary medicines
- The total list of core and supplementary medicines should not exceed 35 so as not to overburden data collectors

Fourteen supplementary medicines were chosen and the final list contained 9 Circular List medicines (see Table 1).

It should be noted that the WHO/HAI survey methodology requires strict adherence to the specific strength and dosage form of a medicine. Therefore this report does not consider alternative strengths or forms which may have been available in Kuwait during the study period (except in the case of fluconazole where the supplementary medicine [50mg] was an alternative strength of the original core medicine [200mg]).

2.3 Reference price lists and the median price ratio (MPR)

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 where:

$$MPR = \text{median local unit price} / \text{reference unit price}.$$

The ratio is thus an expression of how much greater or less the local medicine price is than the international reference price e.g. an MPR of 2 would mean that the local medicine price is twice that of the international reference price. Median price ratios facilitate cross-country comparisons of medicine price surveys.

Two sets of reference prices were used for calculation and presentation of the results:

- the Management Sciences for Health (MSH) reference prices, taken from the *International Drug Price Indicator Guide* (2002), which are the medians of recent procurement or tender prices offered by for-profit and not-for-profit suppliers to developing countries for multi-source (generic) products. The MSH reference prices are therefore relatively low and represent efficient bulk procurement without the costs of shipping or insurance.
- the Pharmaceutical Benefits Scheme (PBS) of the Commonwealth of Australia, which represents the cost which will be reimbursed for a medicine listed under the PBS of the national health system in Australia. These prices are therefore indicative of prices which a patient would be expected to pay for a medicine in a developed country (noting that Australian medicine prices as listed on the Schedule of Pharmaceutical Benefits are lower than those in some major developed nations e.g. United States of America, United Kingdom, but similar to others such as France, New Zealand and Spain) (APC 2001).

MSH reference prices were not available for the following supplementary drugs: carvedilol, fluconazole, gliclazide, indapamide, and simvastatin. The 2002 MSH reference prices were obtained precalculated from HAI and WHO.

PBS reference prices were available for all core and supplementary drugs. The listing price was taken from the Schedule of Pharmaceutical Benefits effective 1 November 2003 (Commonwealth of Australia 2003) choosing either the same pack size or the next larger size as the desired pack size stated in the HAI/WHO manual. The price was converted to USD using the prevailing

exchange rate
(USD 1 = AUD
1.3627)
(www.oanda.com,
23 December
2003) and divided
by the pack size to
obtain a reference
unit price which
was used for
calculations.

Box 1. Sample calculations of price ratios¹ based on official retail prices of innovator brands and PBS reference prices

Medicine Name	Listed pack price KWD (\$)²	Pack size	Unit price KWD (\$)²	PBS unit price KWD (\$)²	Calculated price ratio
Loratadine	5.030 (17.10)	30 tab	0.168 (0.56)	0.295 (1.00)	0.57
Paracetamol	1.460 (4.88)	96 tab	0.015 (0.05)	0.017 (0.06)	0.88
Amoxicillin	3.090 (10.51)	20 cap	0.155 (0.53)	0.085 (0.28)	1.82
Omeprazole	13.000 (43.42)	14 cap	0.929 (3.16)	0.333 (1.11)	2.79
Diclofenac	3.440 (11.49)	30 tab	0.115 (0.39)	0.029 (0.10)	3.97
Ranitidine	20.750 (69.31)	60 tab	0.346 (1.18)	0.079 (0.26)	4.38

¹ Price ratio = (Pack price/pack size) / Reference unit price

² approximate, based on KWD 1 = USD 3.34

In general, when MSH reference prices were used, only core medicines were assessed and when PBS data were used both core and supplementary medicines were included in the calculations. However, the reference price data set used will be indicated for each set of results and the majority of the discussion will be confined to the result derived in comparison with MSH reference prices.

Sample calculations are shown in the inset box. In reality, the price used would be the observed pack price from the surveyed health centres. It can be seen how, even if a medicine is 'expensive', if the reference price is also high (i.e. it is 'expensive' internationally), the price ratio may be relatively low.

Interpreting the MPR

Until more information is gathered through similar studies in other countries, there are no hard and fast rules in the interpretation of MPRs since factors 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 regulation need to be considered. However, the following general rules can be applied:

- Using MSH reference prices, when compared to procurement prices a MPR of 2 or less is indicative of efficient medicine procurement. When compared to retail prices, a MPR of more than 5 might be considered as exorbitant (to allow for wholesale and retail margins and miscellaneous charges over an acceptable procurement price/MPR).
- PBS reference prices are best used for comparing retail medicine prices where a MPR of 1.5 or less indicates reasonable private sector (retail) prices of medicines, although for truly innovative pharmaceuticals the MPR should be closer to 1 (APC 2001).

2.4 Most sold generic equivalents

The HAI/WHO methodology indicates that a survey should be conducted to determine the most sold generic equivalent (MSG) for the study medicines in the private sector on a national basis. An attempt was made to do this by visiting a small group of private pharmacies selected on an *ad hoc* basis. Although a provisional list of MSGs was prepared, the results were inconclusive due to limited generic penetration of the market and marked differences in availability of generics between private pharmacies. To be able to obtain a reliable estimate of the MSG nationally, a survey similar in magnitude to the main pricing survey would have been required. To validate the provisional list, all generic versions of the survey medicines available at private pharmacies were recorded during the main survey. After collection of this data, it was decided that the provisional list was not valid and, instead, the most commonly available generic equivalent should be used as a surrogate of the MSG. It is this data which is presented.

Using this definition affected:

- acetylsalicylic acid, aciclovir, amoxicillin, cephalexin (MSG deleted from provisional list since no generic found)
- co-trimoxazole, glibenclamide, ranitidine (different MSG to that on provisional list)
- gliclazide (include MSG where one did not exist previously on provisional list)

In total, 17 MSG products from 6 different manufacturers were identified (Table 1). No generic equivalents (in the prescribed dosage form and strength) were found in the private sector for: acetylsalicylic acid, aciclovir, amitriptyline, amoxicillin, carbamazepine, carvedilol, cephalexin, chlorpromazine, diazepam, fluconazole, gemfibrozil, hydrochlorothiazide, insulin, indapamide, lisinopril, nifedipine retard, phenytoin, simvastatin.

The limitations in assuming that the most available generic product is the most widely sold should be recognised. However, this is unlikely to have a significant impact on the results given the limited generic penetration of the market - of the 35 medicines, 17 were only available as the innovator brand, 10 had only one generic version available and eight had two or more generic versions available (see Section 4.1).

2.5 Affordability

The HAI/WHO methodology incorporates affordability calculations based on how many days' wages of an unskilled government worker would be required to purchase standard or model treatments using the survey medicines. Due to the differences which exist in salaries for Kuwaiti nationals and non-Kuwaitis (whether expatriates or those permanently resident in Kuwait), separate calculations were performed for these two categories of worker. A model treatment was considered "affordable" if it cost less than 1 days' wages although this is an arbitrary threshold and is open to interpretation and discussion.

Kuwait nationals

The wage of the lowest paid unskilled government worker of Kuwaiti citizenship was taken from the list of salary scales of workers in the Ministry of Health for a level 8 general worker and represents the basic salary plus benefits (KWD 251) less the social insurance and related deductions (KWD 18) i.e. KWD 233 per month or KWD 7.767 per day [\$26/d].

Non-Kuwaitis

Unskilled workers in the public sector who are not Kuwaiti citizens are employees of contracted companies and their official salaries are not available in the public domain. However, from informal discussions, it was determined that the lowest paid worker would receive around KWD 40 per month corresponding to KWD 1.333 per day [\$4.45/d] (see Annex 2 for further information).

2.6 Cost component data

The wholesale and retail prices of medicines in the private sector are set by the Medicine Pricing Department of the Pharmaceutical and Herbal Medicine Registration and Control Administration of the Ministry of Health. These official prices are published annually in a government publication (*Kuwait Today* 2004). To obtain more specific information, an unstructured interview was held with members of the Medicine Pricing Department with regard to the setting of prices of medicines in the private sector.

2.7 Compliance with pricing regulations

The package prices of innovator brand and MSG products in private retail pharmacies were compared with the published official price (*Kuwait Today* 2004). Any discrepancies were noted (size and direction of price difference) and the prevalence of errors calculated. Price

discrepancies for LPG products were not calculated because these products were usually the same as the MSG product and there would not have been any meaningful difference in the results.

2.8 Analysis

Data was entered using double entry into a Microsoft Excel spreadsheet provided by HAI/WHO. This automatically calculated availability, median price ratios along with the interquartile range and affordability. Comparisons of innovator brand and generic medicine prices and investigation of compliance with pricing regulations were determined separately also using Microsoft Excel with correlations calculated using SPSS for Windows v11.0.1 (SPSS Inc.).

Medicines needed to be found in at least 4 pharmacies for their price data to be included in the analysis to allow for robust determination of median price ratios, except for procurement prices where a single data point was accepted.

2.9 The median and IQR

Most people are familiar with the mean (average) of a set of values and the standard deviation (SD) as a measure of the variability of the data. The mean and 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 a better measure of the 'average' value – it is the middlemost value with half of the data points occurring below and half above the median. The variability of non-normal data is commonly expressed as the interquartile range (IQR) – the range or difference between the 1st and 3rd quartiles (25th and 75th 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.

3. Data collection

Public procurement prices were provided from the Central Medical Stores (CMS). They were obtained on 4 March 2004 for products in stock and based on the most recent available data. Data was collected by untrained CMS staff using a medicine list supplied by the MPRG, and data was provided as a cost per unit, without information on pack size or name of generic products i.e. there was no verification of the prices by the investigators. It was also not possible to confirm that an exactly matching dosage form was chosen although notes were made to indicate when certain products were modified release instead of plain formulations or the strength differed to that on the list suggesting that due care was paid to these concerns. Some medicines are procured in patient size packs in the public sector and therefore it would be inappropriate to assume that all the unit prices were calculated from bulk containers. Site visits to public pharmacies confirmed this. The unit prices were generally presented to 3 decimal places (2 cases of 4 decimal places) with 1 – 4 significant figures.

Actual availability of medicines at CMS was not directly investigated by means of a site visit although no data was provided for medicines which were supposedly not in stock. It is the availability based on this data which is reported.

At public health facilities, availability of the medicines was surveyed but not prices since patients do not pay for medicines under health insurance (apart from a user fee paid at each consultation). At hospital pharmacies, the main pharmacy was visited in the first instance, but additional pharmacies or the pharmacy store in the hospital were visited if the product of interest was not kept in the main pharmacy. The data collection form for public health facilities was modified to include known generic names and cross out price columns to facilitate data collection.

At private pharmacies, availability and the price on the medicine container were surveyed at each selected facility. The names and prices of **all** generic equivalents present were collected to allow deeper investigation of the market penetration of generic medicines than is intended under the WHO/HAI methodology. A small number of pharmacies had introduced a barcode pricing system and it was noted that the price on the package did not always match the price in the computer system. This appeared to affect very few medicines but the extent of such discrepancies was not fully investigated. The price on the medicine package was recorded for the purposes of the survey.

Data collection at public and private pharmacies was undertaken by two of the primary investigators during a two week period: 5 – 19 June 2004. There were 6 cases in which the designated pharmacy could not be included either for reasons of refusal to participate (2 cases) or it could not be located or was closed (4 cases). In each instance, the next closest known pharmacy was surveyed in its place.

The 2004 official price list for pharmaceuticals in private pharmacies became effective at the end of March 2004 and was valid until the end of February 2005 i.e. there were no price increases during the period of data collection from private retail pharmacies. Although there was a delay of about 3 months between collection of public procurement and private retail medicine prices because of logistical factors, this does not affect the results of the survey due to the nature and analysis of the data and an annual inflation rate of less than 2% (IMF 2004).

An unstructured interview was held with members of the Pricing Department of the Ministry of Health on 3 January 2005 to discuss the setting of retail prices of medicines in Kuwait.

4. Results

The following analysis will be presented:

- 4.1 Availability of medicines in the public and private sectors
- 4.2 Comparison of medicine prices with international reference prices
- 4.3 Brand premiums in the private sector
- 4.4 The affordability of model treatment regimens
- 4.5 Medicines prices in Kuwait in an international perspective
- 4.6 Compliance with pricing regulations
- 4.7 Price composition of medicine prices

4.1 Availability of medicines in the public and private sectors

It must be kept in mind that the availability data only refers to the **day of data collection** at each particular facility.

Central Medical Stores availability

Of the 21 core medicines, all (100%) were available at Central Medical Stores when data was collected. Five of these were innovator brands and 16 generic equivalents (none were available as both). Thirty-two (91.4%) of all the study medicines were available (10 innovator brands and 22 generic equivalents).

Public sector pharmacy availability

Availability is expressed as the median availability (interquartile range) of medicines across all 25 facilities (Table 2). Availability of specific medicines is shown in Annex 3. Note that patients do not pay for medicines in the public sector pharmacies, and therefore LPG availability is simply a measure of availability of any generic medicine at this level whereas MSG availability refers to specific products identified on a national basis.

Of the core list of medicines, median availability was 12% for innovator brand medicines, 0% for MSGs and 20% for LPGs at public pharmacies (Table 2). The only difference in the median availability when supplementary medicines were included in the calculation was a reduction in the availability of LPG equivalents (12%, 0% and 12% respectively) indicating that the supplementary medicines were less likely than the core medicines to be available as generic versions.

While the concept of MSG and LPG do not apply in the public sector, they do provide a measure of crossover between public and private generic markets i.e. what proportion of generic equivalents used in the public sector are also used in the private sector (or vice versa) and the availability of generic medicines in general in the public facilities. The low availability of MSGs suggests that many of the generics available in the public sector pharmacies are not the same as those most available in the private sector. However, given the limitations of this data (see below), it is not possible to conclude this.

This data on availability of the survey medicines at public health facilities should be viewed with caution and should **not** be taken to mean that there is poor availability of medicines in

government facilities. While many of the survey medicines were not widely available at the public sector facilities, the following factors should be noted:

- Hydrochlorothiazide is generally only kept at hospital level
- Polyclinics in Kuwait only keep 2mg diazepam tablets, not 5mg tablets
- Indapamide 1.5mg SR tablet was commonly available (as the innovator brand) whereas the 2.5mg plain tablet was on the list
- Polyclinics which do not offer specialist diabetic services do not stock most diabetic medicines apart from insulin (seven polyclinics in the sample did not offer diabetic services)
- Most polyclinics do not stock higher cost or infrequently required medicines, including the Circular List medicines surveyed

Bearing in mind the above limitations, the only medicines with 100% availability in public sector pharmacies on the day of the survey were amoxicillin, cephalexin, co-trimoxazole suspension, insulin neutral, paracetamol, ranitidine. Atenolol, beclometasone inhaler, carbamazepine, captopril, diclofenac and nifedipine retard were available in at least 80% of facilities. Those medicines with an availability of less than 30% were Circular List medicines and/or restricted to hospitals in the public sector (carvedilol, ceftriaxone injection, chlorpromazine, ciprofloxacin, diazepam, fluconazole, hydrochlorothiazide, indapamide, omeprazole, simvastatin) except for ibuprofen where strengths other than that surveyed tended to be available.

Private sector availability

Brand medicines were more likely to be found in private sector pharmacies than the MSGs or LPGs (median availability 84%, 12% and 12% respectively for core medicines and 84%, 0% and 0% respectively for all medicines i.e. core plus supplementary medicines) (Table 2). This apparent anomaly of lower availability when including all the medicines, is a reflection of the fact that a smaller proportion of the supplementary medicines were available as generics compared to the core medicines.

This indicates the low generic penetration of the Kuwait market but is also a reflection of the health sector structure in Kuwait. Although this is something which requires further study, it is believed that most patients will go to public health facilities for their medicines where they are available essentially for free. If they do not receive the brand of medicine which they wish, they will then attempt to purchase it at a private retail outlet. This accounts for the high availability of innovator brands in private pharmacies. However, this viewpoint is challenged by the fact that for some medicines, generics are as available as the innovator brand e.g. diclofenac, omeprazole. The perceptions of the public towards brand and generic medicines, brand loyalty and brand demand in Kuwait requires further investigation to fully understand this observation.

Availability of individual medicines in the private sector

The only medicines available on the survey day in all of the private pharmacies as either an innovator brand or generic product were ciprofloxacin, glibenclamide, ibuprofen, indapamide, loratadine, omeprazole, paracetamol and ranitidine with captopril, diclofenac, gliclazide, lisinopril, salbutamol inhaler and simvastatin having greater than 90% availability (Annex 3). Availability was less than 30% for amitriptyline, cephalexin, chlorpromazine, diazepam, fluconazole, hydrochlorothiazide and insulin. Many retail pharmacies do not stock

psychotropic or narcotic medicines and most diabetic patients get their insulin from public sector facilities.

The only brand products not found in at least 4 private sector outlets were chlorpromazine, co-trimoxazole (defined as Bactrim[®]; Septrin[®] was occasionally present), diazepam, hydrochlorothiazide (only stocked by hospitals) and ibuprofen (the 200mg strength had recently been discontinued in Kuwait but the 400mg and other strengths were often available).

The most widely available generics in the private sector (at least 75% availability) were ciprofloxacin, diclofenac, ibuprofen, loratadine, omeprazole, paracetamol and ranitidine. These medicines, together with co-trimoxazole suspension, were the only ones which had more than one generic version available; therefore these were the only eight medicines for which a LPG equivalent was observed which was not the MSG product (see Section 4.3). At the same time, no generics were available at all for very common drugs such as acetylsalicylic acid, amoxicillin, nifedipine retard and simvastatin.

4.2 Comparison of medicine prices with international reference prices

The comparison is presented as the median price ratio (MPR) of the local price with the reference price e.g. a MPR of 2 would indicate that the local price is two times greater than the reference price. When using the MSH reference prices, for procurement prices a MPR of less than 2 would indicate efficient procurement whereas for retail prices a MPR of greater than 5 might indicate excessive medicine prices; the MPR relative to PBS reference prices should be around 1 to 1.5 for retail medicine prices (see Section 2.3).

Procurement prices

Central Medical Stores

Procurement price data was available for 21 core medicines (5 brand and 16 generic equivalents) and 32 medicines in total. The MPRs calculated for core medicines available as innovator brands ranged from 1.2 to 32.9, whereas those available as generic equivalents ranged between 0.1 and 22.2 (MSH reference prices). These data are summarised in Table 3.

On average, generic equivalents of core medicines are purchased at the MSH reference price which represents efficient and cost-effective procurement. Compared to the PBS reference prices, public sector medicines procured as generic equivalents are in the main obtained at about one tenth the PBS price.

On average, brand name medicines are procured at 5 times the MSH reference price or 0.4 of the PBS reference price. This is about 5 times the MPR for generic medicines procured by CMS and represents the brand premium – the extra that the country is paying by purchasing innovator brand medicines rather than available generic equivalents.

Private sector procurement

Private sector 'procurement' prices (landed CIF price) were derived by back-calculating from the official price list using the pricing formula. It was not possible to validate the results of this back-calculation since there was no access to the original data. Both innovator brand and generic medicines were procured at about 10 times the MSH international price (Table 3). It is worth comparing these to the CMS public procurement prices. On average brands were about twice as expensive as the CMS landed CIF cost, while generics were about 10 times the cost.

The results were only slightly different when only comparing matching pairs – when procurement pricing data was available for the innovator brand in both public and private sectors (n=9), the median ratio (interquartile range [IQR]) of private to public procurement prices was 1.5 (1.3 – 3.1). When both public and private procurement prices were available for the MSG (n=14), the median ratio was 7.6 (5.6 – 31.4). From the upper limit of the interquartile range, it is clear that there were some medicines which deviated substantially from the median value.

The observations above relate to possibly smaller quantities being procured in the private sector leading to higher unit costs and a lack of differentiation between brand and generic product pricing by the Medicine Pricing Department of the Ministry of Health (see Section 4.3). The private procurement MPR to Australian PBS reference prices was 1 i.e. on average, the landed cost of the medicines in Kuwait is the same as the reimbursed price in Australia, which would include distribution costs, profit margins and related additional costs over the CIF price.

Private sector retail prices

Median price ratios for core medicines to the MSH reference prices varied between 3.7 to 110 i.e. the price of the medicine to a patient in Kuwait is 3.7 to 110 times the price listed by the MSH (a bulk procurement price). In general the price is about 17 times the MSH reference price (Table 4).

When looking at all medicines and comparing them to the PBS reference prices, the summary MPR varied from 0.5 to 5.0 and with a median just under twice the price listed on the PBS (Table 4; Figures 2 and 3). This is higher than expected (a median of between 1 and 1.5 would indicate reasonable private sector prices) which could relate to a smaller market size in Kuwait, less bargaining power on the part of the government on behalf of consumers, a generous pricing policy for generic medicines and the perceived wealth of the expected consumers among other factors. There was little difference in the MPR for innovator brand medicines and generic equivalents although the latter tended to be slightly higher. This anomaly (higher MPR for generics than brands) indicates that the price differential between innovator brands and generic equivalents is much smaller in Kuwait than in Australia, and probably other major industrial countries. Comparison of the MPRs of ‘medicine pairs’ confirmed the finding (Annex 4) ruling out an artefact of comparing dissimilar medicines (see below).

The small difference between innovator brand and generic medicine MPRs is probably an indication of generic medicines having their selling price based on the selling price of the brand medicine rather than on the actual costs of manufacture. It could be argued that this is a result of low prices of brand name medicines, but the magnitude of the innovator brand MPRs (summary MPR 17.5 relative to MSH prices) suggests that the medicines are in fact very expensive.

It is also worth noting that there is essentially no difference in the MPR for the MSG and the LPG. This is mostly an indication of the small number of generics available for the survey medicines in Kuwait – the MSG and LPG are usually the same product. However, the clustering of prices due to competitor-based pricing strategies also means that there is no meaningful difference when the MSG and LPG are different products. Should a substantial difference between the MSG and LPG MPRs exist, it would suggest that patients could save money by switching to lower priced generic equivalents; this is not the case in Kuwait.

The above summary MPRs for brands and generics are composite values, and include situations where some medicines may only be available as brands and others only available as generics. This could lead to distortion of the results e.g. if those only available as innovator brands are all very expensive. However, comparison of price pairs i.e. when a medicine was available as both brand and a generic equivalent and/or as two different generic equivalents produced almost identical results confirming the observation that while innovator brands tend to have slightly higher MPRs than the same medicine as a generic, this difference is very small (data shown in Annex 4).

Individual medicine price comparisons

Medicine-specific MPRs can be found in Annex 5. Interesting observations include:

- Innovator brand ciprofloxacin tablets in the private sector have the highest MPR (110).
- Generic ciprofloxacin costs 125 times more in the private sector than the public sector (MPR 100 vs. 0.8 respectively). The private sector price is the price the patient pays whereas the public sector price is a bulk procurement price – however this does indicate that the price in the private sector is excessive, containing more than reasonable profit over the production and research and development costs. The fact that the MPR for the generics is only slightly less than that for innovator brand ciprofloxacin suggests that their prices are based on their competitor's prices rather than on production or procurement costs. Although a formula is used in deriving private sector prices, the origin of the cost data from suppliers would appear to be biased to higher costs, perhaps through transfer pricing or similar strategies by manufacturers, perhaps combined with a generous pricing policy towards generic medicines by government regulators.
- Similar pictures are seen with generic diclofenac (brand MPR 91), glibenclamide (brand MPR 56), atenolol (brand MPR 50).
- The generic medicine with the least difference between CMS and private pharmacy prices was loratadine (private pharmacy price 1.4 times the public procurement price) while the innovator brand with the least difference was phenytoin (private price 1.6 times the public procurement price).
- The innovator brand of captopril (Capoten[®] tab 25mg 30 pack) had a lower MPR than the lowest priced generic (Acetab[®] tab 25mg 20 pack). This was the only case of a generic equivalent costing more than its innovator brand. This anomaly could be a result of the generic product being registered first in Kuwait, followed later by registration of the brand – the first registered is given the higher price by the Medicine Pricing Department.
- Central public purchasing of acetylsalicylic acid (MPR 9.1) and diazepam (MPR 22.2) tablets do not appear to be as effective as one would expect. Both were purchased as generics and yet had particularly high MPRs compared to MSH reference prices. Non-proprietary forms of these medicines are widely available on the international market and would expect that they should be procured at prices similar to the MSH prices, as was the case with almost all other centrally purchased medicines. The only other publicly procured generic medicine with a MPR greater than 5 was fluoxetine capsules (MPR 8.0).
- Hydrochlorothiazide which is only available in the public sector, is procured as the innovator brand and at a high MPR of 32.9. Given that generic equivalents are available on the international market for what is an old drug without bioavailability or

pharmacokinetic problems, the use of the innovator brand does not seem necessary. A second thiazide diuretic, indapamide, is also procured as the innovator brand although it was not found to be available in this study due to a recent switch in dosage form in the public sector from the plain tablet to an extended release version which was not surveyed. Indapamide extended release has been observed in private pharmacies suggesting that it is used more widely than hydrochlorothiazide which is restricted to hospitals.

- Beclometasone inhaler is available at a reasonable price both in public procurement (MPR 0.5 for generic equivalent) and in the private pharmacies (MPR 3.7 for innovator brand). The only other medicines with a MPR less than 10 for the innovator brand in private pharmacies were metformin (5.3), loratadine (6.2), lisinopril (6.8), salbutamol inhaler (7.9), phenytoin (8.7) and ceftriaxone injection (9.8).

Some examples of actual prices rather than price ratios are shown in the inset box of Section 2.3 in the sample calculations of MPRs.

4.3 Brand premiums in the private sector

For those medicines available both as innovator brand and a generic equivalent in private pharmacies (n=15), the price of the LPG was expressed as a percentage of the brand price [generic price/brand price x 100]. The median was 87% (IQR 79 – 91%) i.e. on average, the cost of a generic equivalent was 87% that of its innovator brand product (Table 5). Expressed conversely, this is equivalent to a median brand premium of 15% (IQR 10 – 27%).

Generic medicines do not have the same research and development costs as innovator brand medicines and they should be available at much lower prices as a result. In the United States of America (USA), first entry generics are usually at 70-80% of the innovator's price, while the entry of more generic products lowers this to around 40% or less, depending on the number of competing products (CBO 1998; FTA Taskforce 1999; Gross 2003). Kuwait represents a small market and is unlikely to be able to support such an extensive range of generics and so one might not expect the same degree of competition and price reduction. At the same time, since the private sector prices are determined by the State rather than free competition, the relationship between brand and generic prices should not be expected to be same as in countries such as the USA. There was no significant relationship between the generic/brand price ratio and the number of generics available, availability of brand or generic product or the brand MPR confirming the indication that competition is limited in the Kuwait market.

The data from this survey further indicate that generic products in Kuwait are being priced according to competitor prices rather than production or procurement costs with patients paying more than they should. This is in spite of the government controls on the prices of pharmaceuticals in the private sector and suggests that generic manufacturers know the price of the innovator brand medicines and how their product's price will be calculated, and then inflate production or procurement and transport costs e.g. through transfer pricing, so as to ensure their product receives a similar price. An approach where prices of generics are regulated relative to the price of the innovator brand e.g. are not allowed to exceed 70% of the innovator brand price could help to reduce excessive pricing of products such as atenolol and paracetamol but might lead to higher prices for those generics with low price ratios e.g. beclometasone inhaler (Anis et al. 2003). However, one would also need to consider the context and consumer opinion – cheaper medicines might be considered not as 'good' as more expensive medicines and therefore pricing just under the innovator brand price may be a method of conveying that the medicine is of a similar social and health value. In addition, one

could argue that significant cost savings relevant to high wage earners would only be realised on very high cost medicines, few of which were included in this survey, and thus lowering the price of ‘cheaper’ medicines would not necessarily result in increased sales in the Kuwait environment. More information is required about the clientele of private pharmacies to be able to make this conclusion.

4.4 Affordability of model treatment regimens

The affordability of model treatments using the survey medicines was calculated based on the salary of the lowest paid Kuwaiti and non-Kuwaiti workers. The model treatments and the results of the affordability calculations are shown in Table 6.

Public sector

Although patients in the public sector do not need to pay for the medicines they receive since these are covered by compulsory health insurance and a small co-payment, it is clear that the prices obtained in public procurement are low and no patient would have to pay more than one days’ wage to obtain any of the model treatments apart for some of those with Circular list medicines (for non-Kuwaitis). Should patients decide to obtain their treatment from a private community pharmacy, perhaps as a result of missing identity or insurance documents, stock-outs at public facilities, lack of access to the medicines (Circular List medicines for non-Kuwaitis) or psychosocial barriers, the results are very different.

Private sector

In purchasing the model treatments from a private pharmacy, nationals of Kuwait would generally need less than two days’ wages for all except a month of ranitidine (3.1 days), fluoxetine (2.9 days) or omeprazole (3.8 days) therapy with innovator brands (range 0.1 – 0.9). Using generic ranitidine substantially affected the affordability of ranitidine (2.3 days) but not omeprazole (3.3 days). Using the arbitrary threshold of 1 days’ wages being ‘affordable’, it would be concluded that approximately half of the model treatments would be affordable to low-wage Kuwaiti government workers.

Unskilled non-Kuwaiti workers would need more than a days’ wages in all but one case (range 0.9 – 22.0 for brand products; range 0.8 – 19.3 for the LPG). The most ‘expensive’ model treatments were a month’s supply of omeprazole (22.0 days), ranitidine (17.8 days), fluoxetine (17.1 days) and simvastatin (10.8 days); in each case a substantial portion of the worker’s monthly wage would go towards the treatment. This is particularly relevant for omeprazole and simvastatin which are Circular List drugs without a simple replacement available from the public health medicine list. Ciprofloxacin was a particularly expensive medicine (KWD 11.600/10 tablets [about \$ 39]), but the model treatment was relatively inexpensive and ‘affordable’ (costing less than 1 days’ wage) since it only required a single dose.

Only limited data on affordability are available from other countries based on the HAI/WHO methodology (www.haiweb.org/medicineprices/query_aff.php) at the time of writing this report (Table 7). Affordability of innovator brand-based treatments in Kuwait is comparable to the other countries although salbutamol and ranitidine therapy could be a cause for concern. In many of the other countries, patients could get a more affordable treatment by purchasing a generic equivalent product, whereas in Kuwait generic products are not much cheaper than the innovator brands.

4.5 International comparisons of MPRs

As stated above, few studies based on the HAI/WHO methodology have been conducted but some results are available on the HAI website (www.haiweb.org/medicineprices). A comparison is made with these data from private retail pharmacies to place the Kuwait results in context (Figures 4, 5 and 6; Table 8). It should be noted that many of these studies were pilot studies used during development of the HAI/WHO methodology and therefore did not necessarily use the full complement of core drugs and were conducted in 2001/2002. The Egyptian results are based on official price lists without surveying individual pharmacies. Further details of the surveys can be found on the HAI website.

Median price ratios for innovator brands of the eight sample medicines (atenolol, captopril, ceftriaxone injection, ciprofloxacin, glibenclamide, fluoxetine, omeprazole, ranitidine) in Kuwait are comparable to those in Lebanon, Peru, and Ghana (Figure 4) although Kuwait had the highest prices for ciprofloxacin, fluoxetine and omeprazole. Much wider disparities were seen when comparing the observed LPG equivalents for the sample medicines (Figure 5). Generic medicines in Kuwait cost more for each medicine than the other 3 countries, and in some cases the differences were dramatic. For example, the cheapest generic equivalent of ciprofloxacin in Kuwait was 3 times the price of that available in Lebanon and more than 10 times the price of products in Peru and Ghana. Omeprazole showed a similar pattern.

Compared to the results for similar medicine price surveys in twelve other countries, the summary MPRs of medicines in Kuwait are relatively high, although not the highest of the countries shown (Figure 6). The lack of variation between prices for innovator brand and generics in Kuwait is obvious, particularly for lowest price generics; in most countries where data on LPGs was available, this price was much lower than the innovator brand price. The data have not been adjusted for national wealth, and it could be argued that medicine prices in Kuwait are reasonable given the high per capita GDP. However, one must bear in mind that such economic indicators are gross measures of national wealth and economic activity and do not take into account income distribution and other social factors. There are wealth disparities in Kuwait as demonstrated in the affordability calculations; at the same time one needs to acknowledge that most individuals have health insurance and receive most medicines for free in the public sector. However, a quarter of the medicines surveyed in Kuwait were from the Circular List and would not be provided to non-Kuwaitis as outpatients in the public sector. Furthermore, what constitutes a “reasonable” price is contentious and one also needs to examine individual medicine prices (as in Figures 4 and 5). For example, while Peru has a larger summary MPR than Kuwait for innovator brand medicines, the MPR of brand ciprofloxacin and fluoxetine is higher in Kuwait than Peru (Figure 4; Table 8). At the same time, Kuwait has cheaper innovator brand ranitidine and ceftriaxone injection than Ghana and Peru in spite of being a much higher income country.

The assessments above demonstrate how the results of these surveys can be used for international medicine price comparisons. While one should question the variation in brand prices given the respective wealth of each country, the size of the national pharmaceutical manufacturing sector must be considered e.g. India and Egypt, as must the effect of taxes, duties and mark-ups at national and local level. However, further surveys and comparisons between high and low-income countries will provide an evidence base for equity or differential pricing strategies according to which less wealthy populations should pay less than wealthier countries for essential medicines. Once more studies using the same methodology have been performed in the region, there will be more scope for interpretation of the Kuwait data.

4.6 Compliance with pricing regulations

Although not part of the main survey, the compliance with pricing regulations is important in assessing the pricing of medicines in Kuwait. Medicine prices in private retail pharmacies are set by the Ministry of Health and published in *Kuwait Today* to be publicly available. The package prices of innovator brand and MSG products available in private pharmacies were compared to the published official price. A package price was found on every medicine surveyed.

For innovator brands, out of 548 prices there were 85 with errors (15.5%), almost four-fifths (78%) of which were higher than the official price (Table 9). The median error in price was an extra 400 fils (\$1.36). If only those errors which were greater than the official listing were considered, the median error was KWD 0.720 (\$2.45).

The same calculations were performed for the MSG products and the results showed the same pattern as the innovator brands, with 35 errors in 195 prices (18.2% errors), with 77% of the errors to a figure larger than the official price.

It should be noted that the official prices for 2004 were published 1 month prior to the data collection and therefore it is possible that some products, especially slow-moving items, may not have had their prices updated even though this is legally required. In addition, all the atenolol prices were found to differ from the official price (both brand and generic), with almost all showing the same 'wrong' price. This may reflect a case of a price change not reflected in the official price list. If atenolol is removed from the calculations, the prevalence of errors is reduced to 12% for innovator brand products and the median price difference fell to 100 fils (\$0.34).

Inspection of the data showed no obvious attempts at widespread non-compliance with official prices. It would appear that the daily inspections of selected pharmacies in Kuwait by the Inspection Department of the Herbal and Pharmaceutical Medicines Registration and Control Administration, on all aspects of practice including prices, are largely successful in limiting errors on the package prices of medicines. The measures taken by the State of Kuwait to address unethical medicine pricing practices are to be commended.

4.7 Cost component data

The following information was provided in the interview with the Medicines Pricing Department of the Ministry of Health. Medicine price regulation was introduced in Kuwait in 1993. A pricing committee chaired by the Assistant Undersecretary for Quality Control and Inspection sets and approves the prices for newly registered and previously registered medicines to be sold in Kuwait. A maximum profit margin over the landed Cost, Insurance, Freight (CIF) is set with components for the pharmaceutical agents (wholesalers) and the retail pharmacy. At the time of the study the maximum profit was 70% split equally between the agent and the pharmacy. However, for year 2005 this was reduced to 55% (29% for the agent and 26% for the pharmacy) [see inset]. Pharmaceutical agents may offer discounts to pharmacies related to product promotions and bulk purchases.

Official profit margins	2004	2005
Total profit (on CIF)	70%	55%
Wholesaler/agent profit (on CIF)	35%	29%
Pharmacy profit (on CIF)	35%	26%
Pharmacy margin (on wholesale)	26%	20%

No other charges or duties are levied on medicines – an 4% customs duty was removed in 2003. Raw materials for medicine production are also exempt from customs duties. There are current discussions on establishing bulk procurement of medicines for private pharmacies and setting a single unified GCC private retail price for medicines.

In some cases, a generic product may be registered before the brand, in which case it will receive the higher price as the first registered product. There is a desire not to price generics too far below innovator brands so as not to excessively reduce the margins of the pharmaceutical agent. However, as public concern is often raised about the high price of medicines in private pharmacies, there may be a need to revisit principles of the pricing policy with a more careful regulation of generic medicine prices. This could provide an affordable alternative when patient cannot access medicines in the public sector. Public education could also help to raise awareness of the interchangeability of generic and brand products and achieve better acceptance and wider use at a more affordable cost. In addition, there is scope for examining the general agent (wholesaler) and pharmacy profit margins to determine whether it is possible to reduce prices further while still maintaining an adequate return.

5. Conclusions

From inspection of the results of the survey, the following conclusions are reached:

- Public sector procurement of medicines in Kuwait appears to be effective and efficient although the reliance on some innovator brands does not seem necessary.
- Medicines in the private sector are ‘expensive’ in terms of their MPRs calculated with reference to MSH prices and were about twice the corresponding PBS prices on average, suggesting that they are priced higher than is justified.
- There is a wide range in the MPRs for individual medicines which cannot be explained by simple variation in production and transportation costs.
- Some medicines (including generic products) would be unaffordable to low-wage non-Kuwaiti government workers if they had to purchase them from private retail pharmacies.
- There is limited generic penetration of the private health sector and generic medicine prices are not significantly lower than the innovator brands, even when multiple generic products are available.
- Prices of medicines in Kuwait are comparable to a small selection of countries but there is wide variability which calls into question the pricing setting practices of pharmaceutical companies in addition to the customs duties, taxes and margins applied to medicines internationally. There is insufficient data using this methodology to comment on the prices of medicines in Kuwait compared to similar countries in the region or beyond.
- The openness in medicine pricing in Kuwait and the price regulations to prevent overcharging for medicines is to be commended, but the process could be abused by pharmaceutical companies through practices such as transfer pricing and suitable checks and balances e.g. reference pricing, should be introduced.
- The potential benefits of generic medicines on national and private out-of-pocket pharmaceutical expenditure are not fully realised in Kuwait.

Recommendations

The following recommendations are made based on the above conclusions and observations:

1. Maintain and enhance the efficiency of Central Medical Stores public procurement mechanisms. This could include:
 - broadening the base of GCC bulk purchasing and/or the wider use of international purchasing although the latter would have implications for the registration of bidders outside of usual suppliers and corresponding quality control and inspection.
 - increasing procurement by generic name, especially of older drugs
 - restricting the practice of ‘free gift’ (FOC) allocations in CMS procurement as this would allow better comparison of the real prices achieved in public procurement and reduce penetration of nonessential medicines into the market.
 - including private wholesalers/pharmacies or health providers in the Central Medical Stores public procurement for high consumption medicines. This could have a dramatic effect on the prices of medicines in the private sector. (This is occasionally performed for some medicines for private hospitals and is currently under consideration at GCC level.)

2. Establish a form of reference pricing for medicines in the private sector to prevent excessive prices e.g. determine prices compared to a basket of countries of similar wealth distribution and health coverage. This would allow an additional component to be considered in determining the price of medicine other than the country of origin, CIF price and past prices which can be manipulated to some extent by unscrupulous pharmaceutical exporting companies.
3. 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 – this would need to be tied to research into medical practitioner and public attitudes towards generic medicines with appropriately designed educational interventions to address concerns. Greater availability and use of generic medicines can also help to limit collusion monopolies and market segmentation between innovator brand and generic product suppliers.
4. Develop and promote the concept of national formulary or limited (essential) medicine list based on evidence-based selection and used in conjunction with national and/or hospital clinical guidelines. This will help to identify effective, safe medicines, focus procurement and increase efficiency of the supply system, and provide a tool for continued improvement and monitoring of prescribing and patient care.
5. The Circular List should be examined for medicines which could be made available for non-Kuwaiti citizens where suitable alternatives are not available in the public health sector e.g. HMG-CoA reductase inhibitors such as simvastatin. Non-Kuwaitis having to purchase these out-of-pocket may face problems of affordability. Pharmacoeconomic evaluations could be used to provide an evidence-base for decisions on which medicines to be included on the Circular List.
6. Repeat the medicines price survey at suitable intervals to monitor the effects of policies on medicine prices. The survey could be widened to include regional countries and also private hospital medicine prices to get a better picture of the private sector.

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Table 1. List of medicines included in Kuwait medicine price survey

Generic name	Strength	Form	Category	Core list?	Innovator brand	Most sold generic
Acetylsalicylic acid	300mg	tablet	analgesic	no	Aspirin [®]	-
Aciclovir	200 mg	cap/tab	antiviral	yes	Zovirax [®]	-
Amitriptyline	25 mg	cap/tab	antidepressant	yes	Triptizol [®]	-
Amoxicillin	250 mg	cap/tab	antibacterial	yes	Amoxil [®]	-
Atenolol	50 mg	cap/tab	antihypertensive	yes	Tenormin [®]	Tenol [®] -50
	0.05	inhaler	corticosteroid	yes	Becotide [®]	Viarex [®]
Beclometasone	mg/dose					
Captopril	25 mg	cap/tab	antihypertensive	yes	Capoten [®]	Acetab [®]
Carbamazepine	200 mg	cap/tab	antiepileptic	yes	Tegretol [®]	-
Carvedilol *	6.25mg	tablet	antihypertensive	no	Dilatrend [®]	-
Ceftriaxone	1 g/vial	inj	antibacterial	yes	Rocephin [®]	Mesporin [®]
Cephalexin	250 mg	capsule	antibacterial	no	Keflex [®]	-
Chlorpromazine	25mg	tablet	antipsychotic	no	Largactil [®]	-
Ciprofloxacin	500 mg	cap/tab	antibacterial	yes	Ciprobay [®]	Bactiflox [®]
Co-trimoxazole	8+40 mg/ml	susp	antibacterial	yes	Bactrim [®]	Seprin [®]
Diazepam	5 mg	cap/tab	sedative/hypnotic	yes	Valium [®]	-
Diclofenac	25 mg	cap/tab	anti-inflammatory	yes	Voltaren [®]	Olfen [®]
Fluconazole *	50 mg	capsule	antifungal	no	Diflucan [®]	-
Fluoxetine *	20 mg	cap/tab	antidepressant	yes	Prozac [®]	Salipax [®]
Gemfibrozil *	600 mg	tablet	serum lipid reducing	no	Lopid [®]	-
Glibenclamide	5 mg	cap/tab	antidiabetic	yes	Daonil [®]	Doabetic [®]
Gliclazide *	80 mg	tablet	antidiabetic	no	Diamicron [®]	Glyzide [®]
Human insulin neutral	100U	inj	antidiabetic	no	Actrapid [®]	-
Hydrochlorothiazide	25 mg	cap/tab	antihypertensive	yes	Esidrex [®]	-
Ibuprofen	200 mg	tablet	anti-inflammatory	no	Brufen [®]	Profinal [®]
Indapamide *	2.5 mg	tablet	antihypertensive	no	Natrilix [®]	-
Lisinopril *	10 mg	tablet	antihypertensive	no	Zestril [®]	-
Loratadine	10 mg	tablet	antihistamine	no	Claratine [®]	Lorine [®]
Metformin	500 mg	cap/tab	antidiabetic	yes	Glucophage [®]	Metaphage [®]
Nifedipine Retard	20 mg	tablet	antihypertensive	yes	Adalat Retard [®]	-
Omeprazole *	20 mg	cap/tab	antisecretory	yes	Losec [®]	Gasec [®] -20
Paracetamol	500mg	tablet	analgesic	no	Panadol [®]	Adol [®]
Phenytoin	100 mg	cap/tab	antiepileptic	yes	Epanutin [®]	-
Ranitidine	150 mg	cap/tab	antisecretory	yes	Zantac [®]	Rantag [®]
Salbutamol	0.1 mg/dose	inhaler	bronchodilator	yes	Ventolin [®] Evohaler	Butalin [®]
Simvastatin *	10 mg	tablet	serum lipid reducing	no	Zocor [®]	-

Key:

cap/tab = capsule or tablet

* - Circular List medicine; restricted availability in public sector

[®] - registered trademark (denotes trade name)

Table 2. Availability¹ of innovator brand and generic equivalents of the study medicines at public sector pharmacies and private retail pharmacies on the day of data collection.

Sector	Survey medicines	Median availability ¹ (IQR)		
		Brand	MSG	LPG
Public	Only core medicines (n=21)	12% (4 - 36)	0% (0 - 12)	20% (0 - 92)
	All medicines (n=35)	12% (4 - 38)	0% (0 - 10)	12% (0 - 80)
Private	Only core medicines (n=21)	84% (48 - 92)	12% (0 - 40)	12% (0 - 56)
	All medicines (n=35)	84% (28 - 92)	0% (0 - 36)	0% (0 - 50)

Notes:

¹The data are the median of the availabilities of the specified survey medicines at 25 pharmacies in either the public or private sectors. Although availability may appear low at public facilities, this is mostly an anomaly due to distribution controls on many of the surveyed medicines.

Key:

MSG – most sold generic equivalent

LPG – lowest priced generic equivalent

IQR – interquartile range

Table 3. Summary of price comparison data for procurement of medicines by Central Medical Stores in the public sector and for the private sector¹.

Reference price	Sector	Type and No. of medicines	Median Price Ratio (MPR) to Reference Price		
			Median MPR (IQR)	Minimum MPR	Maximum MPR
MSH (core medicines only)	Public	Brand (n=5)	5.0 (4.2 - 5.3)	1.2	32.9
		Generic ² (n=16)	1.2 (0.5 - 2.7)	0.1	22.2
	Private	Brand (n=21)	10.1 (8.5 - 32.4)	2.2	64.4
		Generic ² (n=12)	9.5 (7.7 - 33.2)	1.2	58.5
PBS ³ (all medicines)	Public	Brand (n=10)	0.4 (0.3 - 0.5)	0.2	0.8
		Generic ² (n=22)	0.1 (0.04 - 0.2)	0.01	0.6
	Private	Brand (n=33)	1.0 (0.7 - 1.3)	0.3	2.6
		Generic ² (n=16)	1.1 (0.6 - 1.5)	0.3	2.4

Notes:

¹Procurement prices are the landed CIF cost back-calculated from the official wholesale price using the 35% allowed profit margin for pharmaceutical agents. The most sold generic equivalent was used for calculation of generic procurement prices. Innovator brand ibuprofen priced lower than the most sold generic product; it was excluded from the analysis in case this was a result of the price not having been updated due to its withdrawal from the market.

²Data is shown for the Lowest Priced Generic (LPG) equivalent.

³PBS reference prices are best used with retail medicine prices; the procurement MPRs shown here are for completeness.

Key:

MSH – Management Sciences for Health

PBS – Pharmaceutical Benefit Scheme

IQR – interquartile range

MPR – median price ratio

Table 4. Summary of medicine price ratios for private pharmacies.

Reference prices used (survey medicines)		Median Price Ratio (MPR) to Reference Price		
		Median MPR (IQR)	Minimum MPR	Maximum MPR
MSH (core medicines only)	Brand (n=18)	18.3 (11.0 - 45.0)	3.7	110.2
	MSG (n=10)	16.1 (14.9 - 49.6)	4.8	100.1
	LPG (n=10)	15.9 (14.2 - 49.9)	4.8	100.1
PBS (all medicines)	Brand (n=28)	1.7 (1.1 - 2.7)	0.6	5.0
	MSG (n=13)	1.9 (1.0 - 2.6)	0.5	4.3
	LPG (n=13)	1.9 (1.0 - 2.6)	0.5	3.8

Key:

IQR – interquartile range

LPG – lowest priced generic equivalent

MSG – most sold generic equivalent

MPR – median price ratio

MSH – Management Sciences for Health

PBS – Pharmaceutical Benefit Scheme

Table 5. Comparison of lowest price generic and innovator brand prices¹ for medicines in the private sector.

Medicine name	Generic price as percentage of brand price (%)	No. of generic products available	Brand availability (%)	Generic availability (%)	Brand MPR (PBS ref. prices)
Beclometasone inh.	54	1	56	4	1.0
Ranitidine	63	6	92	88	5.0
Diclofenac	73	3	84	80	4.0
Salbutamol inh.	78	1	96	12	2.2
Omeprazole	79	6	88	100	2.9
Ciprofloxacin	79	7	96	80	1.2
Fluoxetine	86	1	48	4	2.9
Gliclazide	87	1	92	8	2.8
Ceftriaxone inj.	88	1	84	64	2.7
Metformin	89	1	72	28	0.8
Loratadine	90	5	96	88	0.6
Glibenclamide	91	3	100	44	3.7
Paracetamol	93	3	96	92	0.9
Atenolol	95	1	96	56	1.7
Captopril	118	2	88	16	1.8
All (median) n=15	87	2	92	56	2.2
Spearman's R	-	-0.122²	0.073²	0.073²	-0.375²

Notes

¹Price data based on median price observed in private pharmacies for innovator brand and lowest priced generic equivalent. Table includes all products which were found as both a brand and a generic version.

²Not statistically significant

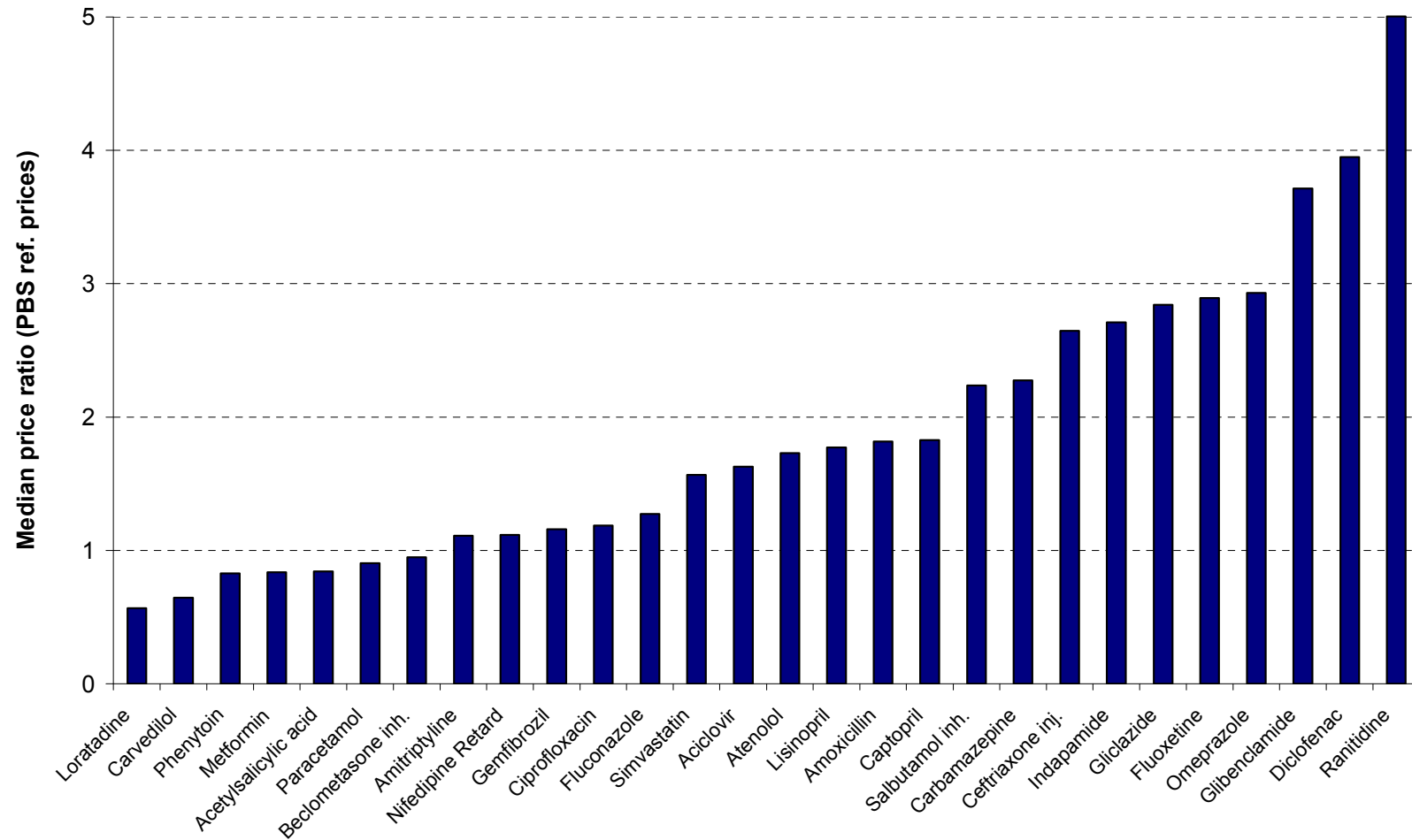
Key:

LPG – lowest priced generic equivalent

MPR – median price ratio

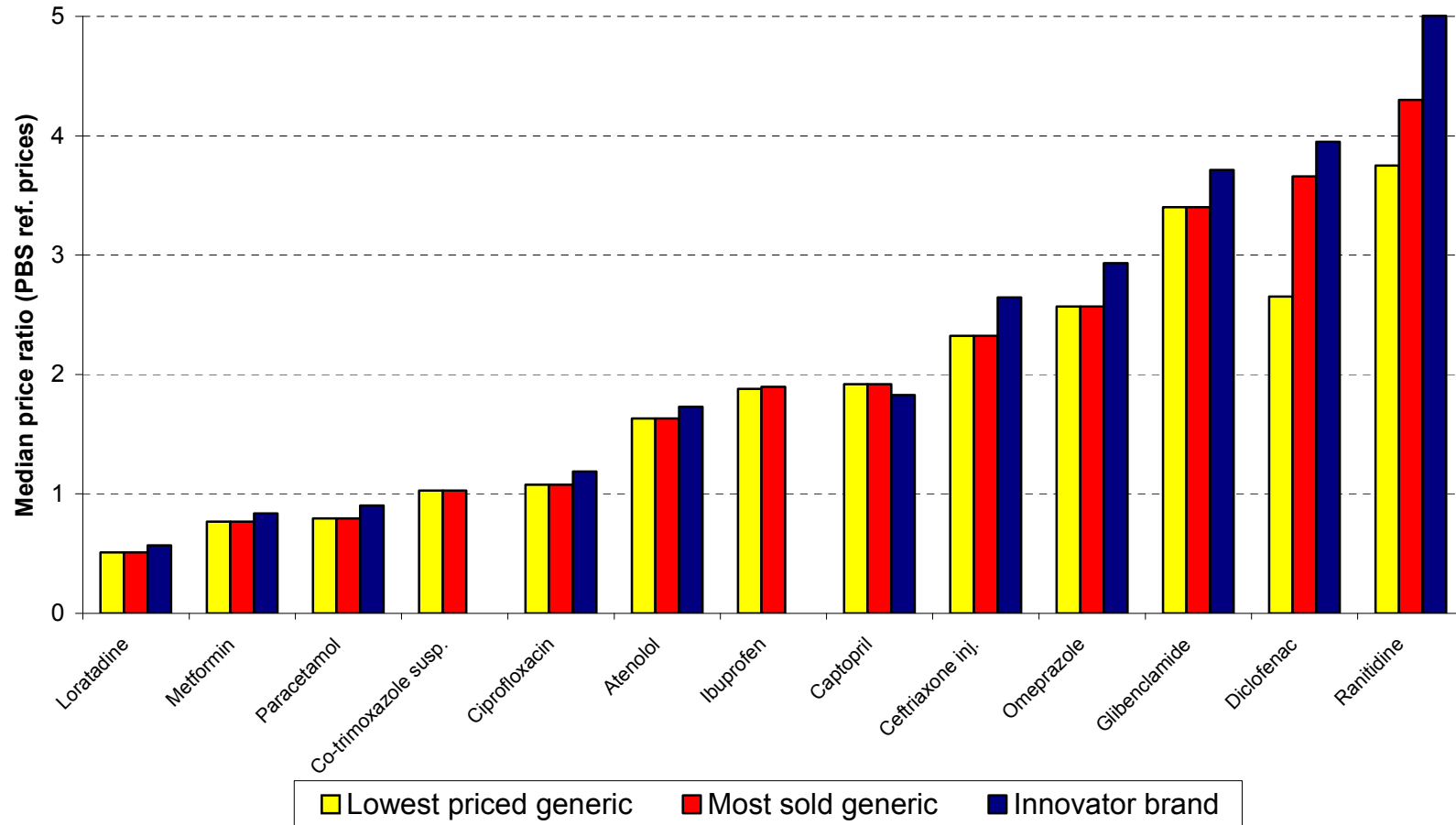
PBS – Pharmaceutical Benefit Scheme

Figure 2. Median price ratios (PBS reference prices) for innovator brand medicines at private retail pharmacies in Kuwait.



Key: PBS ref. prices – Pharmaceutical Benefits Scheme reference prices

Figure 3. Median price ratios (PBS reference prices) for innovator brand and generic medicines at private retail pharmacies in Kuwait.



Note: only medicines which were available as generic equivalents in private pharmacies are shown in the figure. Innovator brands of ibuprofen and co-trimoxazole suspension were not available.

Key: PBS ref. prices – Pharmaceutical Benefits Scheme reference prices

Table 6. Affordability of model treatments to the lowest paid Kuwaiti and non-Kuwaiti government workers shown as the number of days' wages required to pay for the treatment course obtained either in the public sector¹ or from a private pharmacy.

Disease condition and 'model' drug treatment			No. of days' wages required to purchase treatment					
			Kuwaiti			Non-Kuwaiti		
Condition	Drug name	Dosage and duration	Public	Private brand ²	Private generic ²	Public	Private brand	Private generic
Arthritis	Diclofenac	25mg twice daily x 30 days	0.0	0.9	0.6	0.0	5.2	3.5
Asthma	Salbutamol inhaler	As needed x 1 pack	0.1	0.5	-	0.4	3.0	-
Depression	Amitriptyline	25mg three times daily x 30 days	0.1	0.3	-	0.5	2.0	-
Depression	Fluoxetine*	20mg daily x 30 days	0.3	2.9	-	1.5	17.1	-
Diabetes	Glibenclamide	5mg daily x 30 days	0.0	0.6	0.6	0.3	3.6	3.3
Epilepsy	Phenytoin	100mg three times daily x 30 days	0.1	0.2	-	0.7	1.2	-
Gonorrhoea	Ciprofloxacin	500mg single dose	0.0	0.1	0.1	0.0	0.9	0.8
Hypertension	Atenolol	50mg daily x 30 days	0.0	0.5	0.4	0.1	2.7	2.6
Hypertension	Carvedilol*	6.25mg twice daily x 30 days	0.7	1.4	-	4.4	7.9	-
Hypertension	Hydrochlorothiazide	25mg daily x 30 days	0.1	-	-	0.7	-	-
Hypertension	Lisinopril*	10mg daily x 30 days	0.1	1.2	-	0.6	7.0	-
Hyperlipidemia	Gemfibrozil*	600mg twice daily x 30 days	0.5	1.3	-	3.0	7.5	-
Hyperlipidemia	Simvastatin*	10mg daily x 30 days	0.6	1.9	-	3.7	10.8	-
ARI ³ (adult)	Amoxicillin	250mg three times daily x 7 days	0.0	0.4	-	0.1	2.4	-
ARI ³ (child)	Co-trimoxazole susp	5mL twice daily x 7 days	0.0	-	0.2	0.0	-	1.0
Ulcer (peptic)	Ranitidine	150mg twice daily x 30 days	0.0	3.1	2.3	0.1	17.8	13.3
Ulcer (duodenal)	Omeprazole*	20mg daily x 30 days	0.3	3.8	3.3	1.5	22.0	19.3

Notes

¹ - medicines are provided free in the public sector in Kuwait except Circular List medicines (*) which are only free for and only provided to Kuwaiti citizens

² - brand cost based on purchase of the innovator brand product; generic cost based on purchase of the lowest priced generic equivalent (LPG)

³ - acute respiratory infection

Table 7. Affordability, using innovator brand medicines from private retail pharmacies, of common treatments to the lowest paid government workers for national medicine price surveys utilising the HAI/WHO methodology.

Condition (drug) ²	Affordability (No. of days' wages required)											
	Country and survey date ¹											
	Armenia 2001	Brazil 2001	Cameroon 2002	Ghana 2002	India 2003	Kenya 2001	Kuwait ³ 2004	Lebanon 2004	Peru 2002	Philippines 2002	S. Africa 2001	Sri Lanka 2001
Diabetes (glibenclamide)	-	-	8.1	7.5	0.2	-	3.6	1.3	4.4	3.3	-	-
Asthma (salbutamol inhaler)	2.6	2.8	-	5.8	0.6	4.1	3.0	-	2.6	2.2	1.1	2.1
Depression (amitriptyline)	-	7.2	-	-	1.0	5.7	2.0	0.9	6.4	-	4.6	1.9
Gonorrhoea (ciprofloxacin)	3.4	1.4	2.1	-	0.0	3.3	0.9	0.6	0.9	0.6	0.5	0.1
Hypertension (atenolol)	-	-	-	-	0.4	-	2.7	1.8	3.8	4.4	-	-
Ulcer, peptic (ranitidine)	18.9	11.7	50.5	67.5	0.2	-	17.8	-	7.9	13.2	6.4	5.5

Notes:

¹from <http://www.haiweb.org/medicineprices>; see text and data source for data limitations.

²only those model treatments where an innovator brand was available in the Kuwait survey and other country data were available are shown; the dosage and duration of therapy are available in Table 6.

³affordability for the lowest paid non-Kuwaiti government worker is shown

Key:

HAI – Health Action International

WHO – World Health Organization

Table 8. Comparison of median medicine price ratios (MPRs) for selected medicines from private retail pharmacies in four countries.

Medicine name	Survey and type of medicine (data are median price ratios relative to MSH reference prices)											
	Kuwait, June 2004			Ghana, May 2002*			Peru, May 2002*			Lebanon, March 2004*		
	IB	MSG	LPG	IB	MSG	LPG	IB	MSG	LPG	IB	MSG	LPG
Atenolol	50.2	47.4	47.4	-	8.2	8.0	71.3	20.4	19.7	47.8	9.8	9.8
Captopril	15.3	16	16	-	-	5.8	16.9	5.0	5.0	12.7	8.4	4.9
Ceftriaxone inj	9.8	8.6	8.6	13.2	-	5.1	15.9	2.4	3.6	8.1	5.5	5.5
Ciprofloxacin	110.2	100.1	100.1	-	8.0	8.9	94.1	63.2	7.9	104.1	29.3	29.3
Fluoxetine	93.6	-	-	-	-	-	85.9	20.7	20.7	64.1	58.0	29.2
Glibenclamide	55.5	50.8	50.8	39.9	6.6	8.0	89.0	69.3	43.5	29.3	6.2	6.0
Omeprazole	17.9	15.7	15.7	5.9	0.7	0.6		1.1	1.1	17.6	7.6	5.4
Ranitidine	18.7	16.1	14.1	44.0	-	11.0	19.6	16.4	5.5	12.7	6.5	1.9

Notes:

*Data taken from <http://www.haiweb.org/medicineprices>; see text for data limitations

Key:

IB – Innovator brand

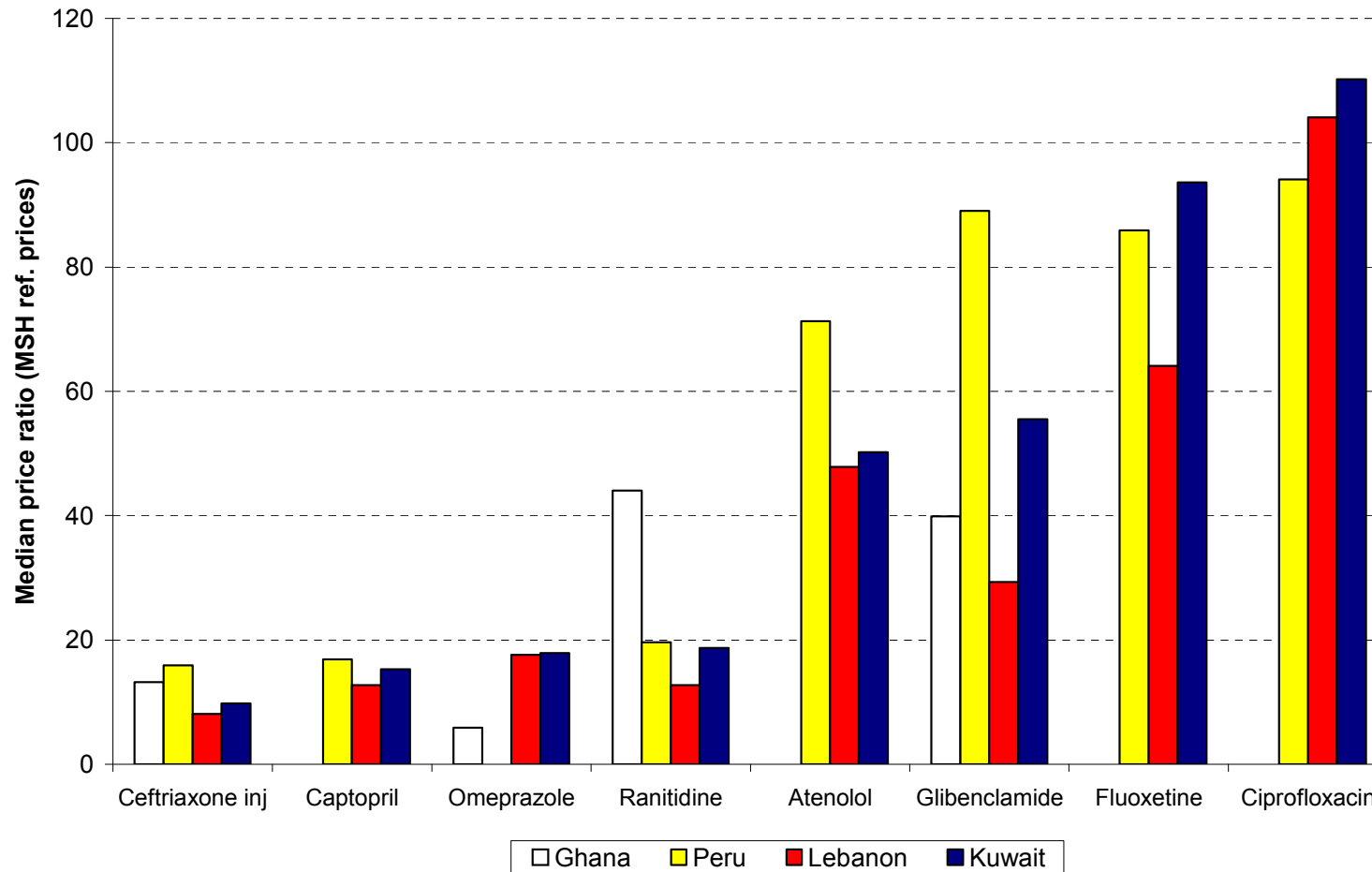
MSG – most sold generic

LPG – lowest priced generic

MSH – Management Sciences for Health

MPR – Median price ratio

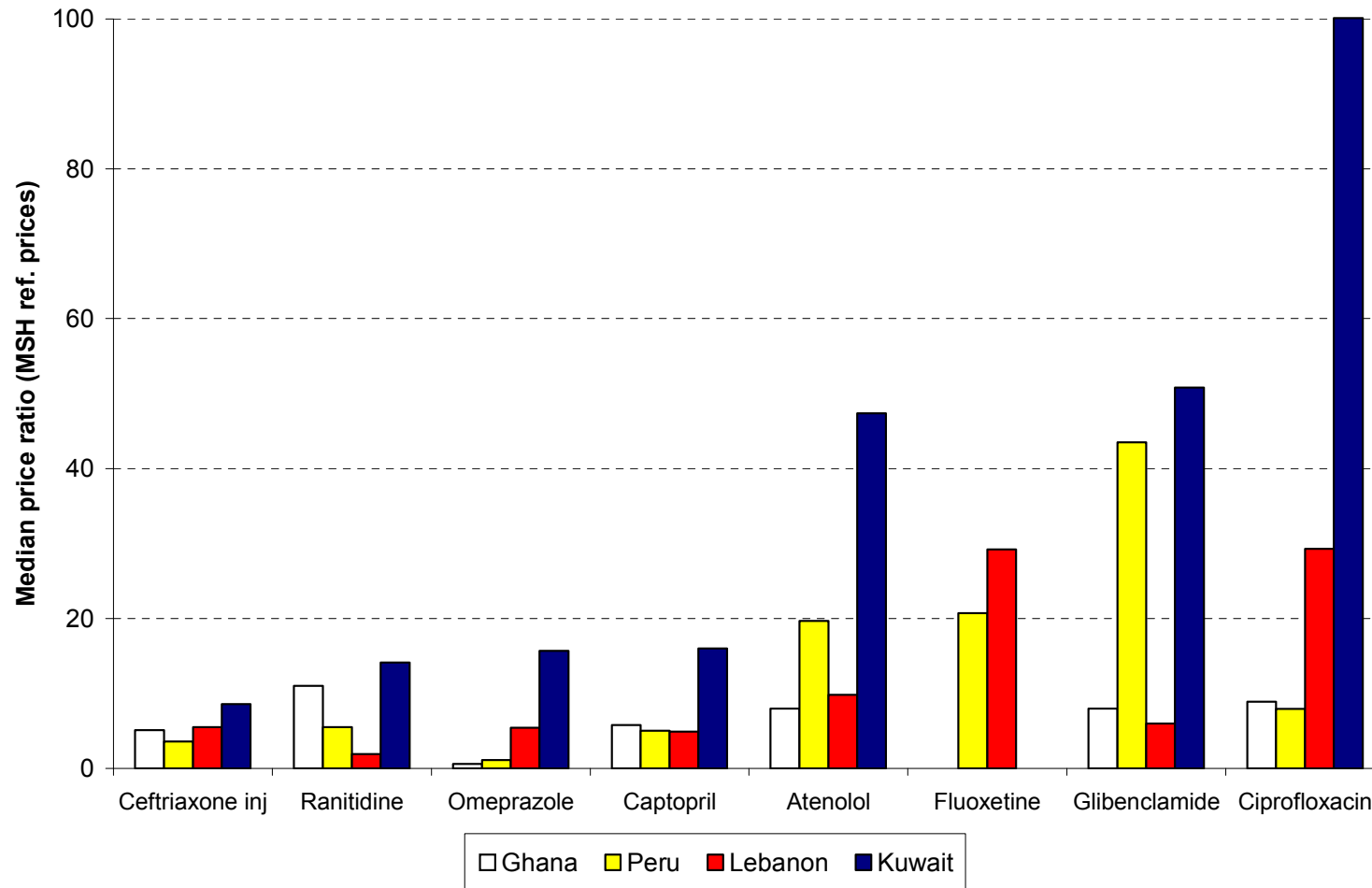
Figure 4. Median price ratios (MSH reference prices) for Innovator Brands of eight medicines in private retail pharmacies across four countries.



Note: Other country data from <http://www.haiweb.org/medicine> prices. No data available for innovator brand ciprofloxacin, fluoxetine, atenolol, captopril(Ghana) and omeprazole (Peru).

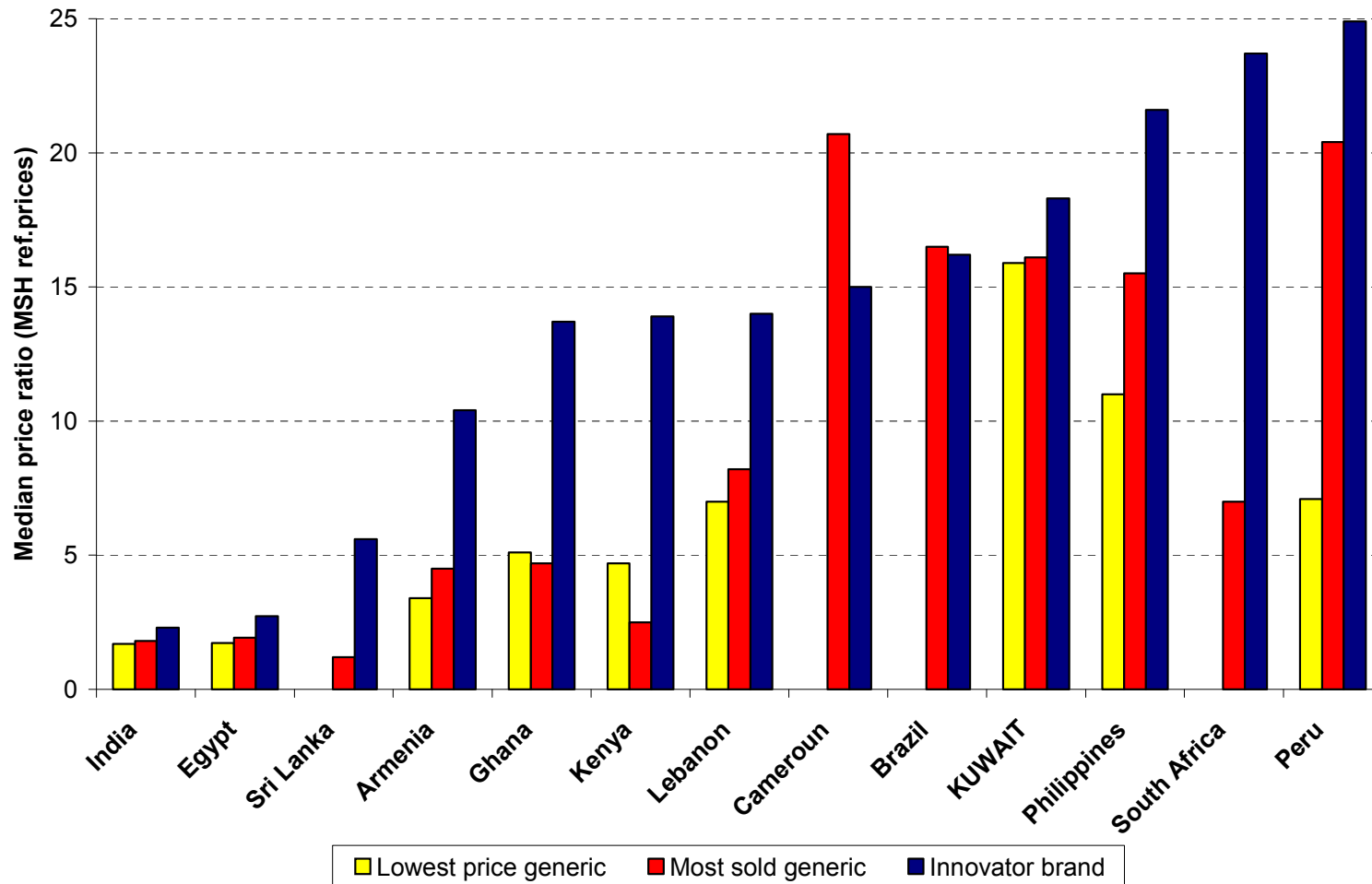
Key: MSH ref. prices – Management Sciences for Health reference prices

Figure 5. Median price ratios (MSH reference prices) for Lowest Priced Generic versions of eight medicines in retail pharmacies across four countries.



Note: Other country data from http://www.haiweb.org/medicine_prices. No data available for generic fluoxetine from Kuwait or Ghana.
Key: MSH ref. prices – Management Sciences for Health reference prices

Figure 6. Comparison of medicine price ratio from medicine price surveys in private retail pharmacies across thirteen countries.*



Notes: Other country data from <http://www.haiweb.org/medicineprices>; see text and data source for data limitations.

Key: MSH ref. prices – Management Sciences for Health reference prices

Table 9. Pricing errors on innovator brands in private pharmacies compared to the official pricing list from the Ministry of Health.

Medicine	No. of correct prices	No. of wrong prices	Errors (%)	Comments (error higher/lower than set price)
Acetylsalicylic acid	21	0	0	
Aciclovir	9	6	40	All higher; One 20 tab pack instead of 25 tablets
Amitriptyline	2	2	50	All higher
Amoxicillin	8	1	11	Higher
Atenolol	0	24	100	All higher; 23 with the same price
Beclometasone inh	12	2	14	Higher
Captopril	20	2	9	One higher (KWD2.940); One lower (KWD1)
Carbamazepine	19	1	5	Lower
Carvedilol	13	1	7	Higher
Ceftriaxone inj	2	19	90	Set price for 5 vial pack, not singles; 11 higher, 8 lower
Cephalexin	1	1	50	Higher (KWD1.750); used price for 500mg capsules
Chlorpromazine	0	0	-	
Ciprofloxacin	23	0	0	
Co-trimoxazole susp	0	0	-	
Diazepam	0	0	-	
Diclofenac	16	5	24	One higher; three lower
Fluconazole	5	0	0	
Fluoxetine	12	0	0	
Gemfibrozil	18	1	5	Lower
Glibenclamide	24	1	4	Higher
Gliclazide	23	0	0	
Hydrochlorothiazide	0	0	-	
Ibuprofen	0	0	-	
Indapamide	23	2	8	One higher; one lower
Insulin neutral	2	1	33	Higher
Lisinopril	20	3	13	Two higher (one by KWD2); one lower
Loratadine	23	1	4	Higher
Metformin	18	0	0	
Nifedipine Retard	24	0	0	
Omeprazole	19	3	14	Higher (1 x KWD4; 2 x KWD1.110)
Paracetamol	23	1	4	Higher
Phenytoin	18	3	14	All higher
Ranitidine	22	1	4	Higher
Salbutamol inhaler	22	2	8	Higher
Simvastatin	21	2	9	One higher; one lower (KWD1.590)
Total (w/o atenolol*)	463	61	12	42 higher (69%), 19 lower (31%)
Total	463	85	16	66 higher (78%), 19 lower (22%)

Notes:

*without the data for atenolol due to 100% error prevalence which may reflect an undocumented price change.

Annex 1. National pharmaceutical sector form

National Pharmaceutical Sector form

Date: 10 June 2004

Population: 2,183,161 note: includes 1,291,354 non-nationals (July 2003 est.)

Rate of exchange (commercial “buy” rate) to US dollars on the first day of data collection:

USD 1 = KWD 0.2948; KWD 1 = USD 3.3924 (www.oanda.com)

Sources of information:

Dr. Ahmad Al-Duaij, Director, Pharmaceutical Services Directorate, Ministry of Health

Ph. Qadriya Al-Awadi, Pharmaceutical Services Directorate, Ministry of Health

Dr. Nabeel Al-Saffar, Pharmaceutical Services Directorate, Ministry of Health

Ph. Yacoub Salem, Central Medical Stores, Ministry of Health

General information on the pharmaceutical sector

Is there a formal National Medicines Policy document covering both the public and private sectors? Yes No

Is an Essential Medicines List (EML) available? Yes No

If yes, state total number of medicines on national EML: **approximately 2800**

If yes, year of last revision: **n/a (under continuous review)**

If yes, is it (tick all that apply):

- National
- Regional
- Public sector only
- Both public and private sectors
- Other (please specify):

If yes, is the EML being used (tick all that apply):

- For registration of medicines nationally
- Public sector procurement only
- Insurance and/or reimbursement schemes
- Private sector
- Public sector

Is there a policy for generic prescribing or substitution? Yes No

Are there incentives for generic prescribing or substitution? Yes No

Public procurement¹

Is procurement in the public sector limited to a selection of essential medicines? Yes No

If no, please specify if any other limitation is in force:

Type of public sector procurement (tick all that apply):

- International, competitive tender
 - Open
 - Closed (restricted)
- National, competitive tender
 - Open
 - Closed (restricted)
 - Negotiation/direct purchasing

¹ If there is a public procurement system, there is usually a limited list of items that can be procured. Products procured on international tenders are sometimes registered in the recipient country only by generic names. Import permits to named suppliers are issued based on the approved list of tender awards. An open tender is one that is publicly announced; a closed one is sent to a selection of approved suppliers.

- Are the products purchased all registered? Yes No
- Is there a local preference?² Yes No
- Are there public health programmes fully implemented by donor assistance which also provide medicines? Yes No
(e.g. TB, family planning, etc.)
- If yes, please specify:

Distribution³

- Is there a public sector distribution centre/warehouse? Yes No
- If yes, specify levels: One national Central Medical Stores (CMS)
- Are there private not-for-profit distribution centres: Yes No
e.g. missions/nongovernmental organizations?
- If yes, please specify:
- Number of licensed wholesalers: (Pharmaceutical agents) **32**

Retail

	Urban	Rural	Overall
Number of inhabitants per pharmacy (approx.)	10,000	-	10,000
Number of inhabitants per qualified pharmacist (approx.)	1,800	-	1,800
Number of pharmacies with qualified pharmacists	218	-	218
Number of medicine outlets with pharmacy technician	0	-	0
Number of other licensed medicine outlets	0	-	0

Private sector⁴

- Are there independent pharmacies? Yes No Number: **178**
- Are there chain pharmacies? Yes No Number: **40**
- Do doctors dispense medicines?⁵ Yes No
- If yes, approximate coverage or % of doctors who dispense:
- Are there pharmacies or medicine outlets in health facilities? Yes No

² A local preference means that local companies will be preferred even if their prices are not the cheapest. Local preference is normally in the range of 10–20%.

³ The public sector often has a central storage and distribution centre which may have at least one sublevel. The private not-for-profit sector may be dominated by one type of NGO (e.g. church missions), but may also comprise others such as Bamako Initiative type projects, Red Cross or Red Crescent Society, Médecins Sans Frontières.

⁴ Retail outlets may be called pharmacies, medicine outlets, drug stores, chemists, etc. They may be run/owned by a qualified pharmacist (with diploma) or another category: e.g. pharmacy technician, or a lay person with short training.

⁵ Many countries allow doctors to dispense and sell medicines.

Financing

(Give approximate figures, converted to US dollars at current exchange rate: commercial “buy” rate on the first day of data collection)

Type of expenditure	Approximate annual budget (US dollars)
National public expenditure on medicines including government insurance, military, local purchases in past year	USD 140 million
Estimated total private medicine expenditure in past year (out of pocket, private insurance, NGO/mission)	About USD 60 million
Total value of international medicine aid or donations in past year	0
What percentage of medicines by value are imported?	approximately 90%

Government price policy

Is there a medicines regulatory authority?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Is pricing regulated?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Is setting prices part of market authorization/registration?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Do registration fees differ between:		
■ Innovator brand and generic equivalents	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
■ Imported and locally produced medicines	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Public sector

Are there margins (mark-ups) in the distribution chain?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
■ Central medical stores		%
■ Regional store		%
■ Other store (specify)		%
■ Public medicine outlet		%
Are there any other fees or levies?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
If yes, please describe:		

Private retail sector

Are there maximum profit margins?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
If yes (if they vary, give maximum and minimum):		
■ Wholesale	35% (on CIF) [2005 – 29%]	
■ Retail	35% (on CIF) ; 26% (on wholesale) [2005 – 26% and 20%]	
Is there a maximum retail price (sales price)? (If it varies, give maximum and minimum)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
■ Maximum:		
■ Minimum:		

Do patients pay professional fees (e.g. dispensing fee)? Yes No
If yes, please describe:

“Other” sector

Are there maximum profit margins? Yes No

If yes (if they vary, give maximum and minimum):

- Wholesale %
- Retail %

Is there a maximum sales price? Yes No

Insurance, risk-sharing or prepayment schemes

Are there any health insurance, risk-sharing or prepayment schemes or revolving medicine funds? Yes No

If yes, please describe: **compulsory national health insurance (through independent insurers)**

Are all medicines covered? Yes No

If no, state which medicines are covered (e.g. EML, public health programmes):

EML medicines covered in public sector; some high-cost EML medicines only covered for Kuwaiti and GCC citizens resident in Kuwait.

Are some patients / groups of patients exempted, regardless of insurance coverage? (e.g. children < X yrs, war veterans) Yes No

If yes, please specify: **Kuwaiti citizens**

Estimated percentage of population covered **100%**

Is it official policy to supply all medicines free at primary health care level? Yes No

If no, are some free? Yes No

If yes, tick all that apply:

- Tuberculosis
- Malaria
- Oral rehydration salts
- Family planning
- Others, please specify:

Are there official user charges/patient co-payments/fees? Yes No

Are all medicines supplied free at hospitals? Yes No

If no, are some free? Yes No

If yes, please specify:

Annex 2 - Explanatory notes to affordability calculations

Determination of the wage of the lowest paid unskilled government worker – non-Kuwaiti

There is no official minimum wage in Kuwait and the government does not directly employ unskilled labourers. Rather, a competitive out-sourcing procedure is used with companies bidding for cleaning, security and similar contracts. These contracts, which remain confidential between the government and the winning bidder, will specify a sum to be paid to the workers who will be recruited to perform the work. However, the net salary paid to the employees will be less than this amount after deductions for accommodation, health insurance and other fees which vary depending on the company involved. Informal interviews were held with security and cleaning personnel employed by government departments which indicated that they received a disposable income of KWD 22 – 25 per month, a range that corresponded well with anecdotal accounts of the income of low-paid workers.

However, it would not be appropriate to compare these net earnings with salaries for Kuwaiti workers who would still have to pay transport, accommodation, and similar costs from their salary (although most single Kuwaiti workers would be expected to live in their parent's house). Low-wage workers in the private sector e.g. domestic workers, receive at least KWD 40 per month (or more depending on factors such as country of origin, language skills, responsibilities) out of which they would have to pay accommodation (if not live-in workers) and other expenses. They thus receive a salary more similar in construct to that of government Kuwaiti workers and one which may act as a surrogate for the gross salary a non-Kuwaiti government worker might receive.

With the obvious limitations of this data, for the purposes of affordability calculations the wage of the lowest paid non-Kuwaiti government worker was taken to be KWD 40 per month or KWD 1.333 per day.

Annex 3. Availability of individual medicines in the survey

Median availability of the study medicines as innovator brands, most sold generics and lowest priced generics in 25 public and 25 private pharmacies in Kuwait

Medicine Name	Core List?	Availability (%)					
		Brand		MSG		LPG	
		Public (n=25)	Private (n=25)	Public (n=25)	Private (n=25)	Public (n=25)	Private (n=25)
Acetylsalicylic acid	no	4	84	0	0	60	0
Aciclovir	yes	4	60	0	0	28	0
Amitriptyline	yes	40	16	0	0	0	0
Amoxicillin	yes	12	36	0	0	100	0
Atenolol	yes	4	96	92	56	92	56
Beclometasone inhaler	yes	4	56	92	4	92	4
Captopril	yes	0	88	84	16	96	16
Carbamazepine	yes	80	84	0	0	0	0
Carvedilol	no	20	56	0	0	0	0
Ceftriaxone injection	yes	12	84	0	64	8	64
Cephalexin	no	0	8	0	0	100	0
Chlorpromazine	no	12	0	0	0	0	0
Ciprofloxacin	yes	0	96	0	72	12	80
Co-trimoxazole suspension	yes	4	0	0	32	100	40
Diazepam	yes	20	0	0	0	0	0
Diclofenac	yes	0	84	4	72	88	80
Fluconazole	no	12	20	0	0	0	0
Fluoxetine	yes	8	48	12	4	12	4
Gemfibrozil	no	40	80	0	0	0	0
Glibenclamide	yes	4	100	36	20	72	44
Gliclazide	no	68	92	0	8	0	8
Hydrochlorothiazide	yes	16	0	0	0	0	0
Ibuprofen	no	0	0	16	84	16	100
Indapamide	no	0	100	0	0	0	0
Insulin neutral	no	100	12	0	0	0	0
Lisinopril	no	72	92	0	0	0	0
Loratadine	no	8	96	24	80	52	88
Metformin	yes	52	72	36	28	36	28
Nifedipine Retard	yes	80	96	0	0	0	0
Omeprazole	yes	0	88	8	96	20	100
Paracetamol	no	0	96	60	88	100	92
Phenytoin	yes	36	84	0	0	0	0
Ranitidine	yes	24	92	0	40	96	88
Salbutamol inhaler	yes	88	96	0	0	0	12
Simvastatin	no	12	92	0	0	0	0
Median Availability	All	12	84	0	0	12	0

Notes:

¹The data are the median of the availabilities of the specified survey medicines at 25 pharmacies in either the public or private sectors. Although availability may appear low at public facilities, this is mostly an anomaly due to distribution controls on many of the surveyed medicines.

Key:

MSG – most sold generic equivalent

LPG – lowest priced generic equivalent

Annex 4 – Pair-wise comparison of the prices of medicines in the private sector available as both brand and generic equivalents with international reference prices

(a) Core medicines only – MSH reference prices

		No. of pairs	Median MPR (IQR)	Minimum MPR	Maximum MPR
Type of medicine price pair	Brand	9	18.7 (15.3 - 55.5)	5.3	110.2
	MSG		16.1 (15.7 - 50.8)	4.8	100.1
	Brand	9	18.7 (15.3 - 55.5)	5.3	110.2
	LPG		16 (14.1 - 50.8)	4.8	100.2
	MSG	10	16.1 (14.9 - 49.9)	4.8	100.1
	LPG		15.9 (14.2 - 49.9)	4.8	100.1

(b) All medicines – PBS reference prices

		No. of pairs	Median MPR (IQR)	Minimum MPR	Maximum MPR
Type of medicine price pair	Brand	11	1.8 (1.1 - 3.3)	0.5	4.3
	MSG		1.9 (0.9 - 3.0)	0.5	4.3
	Brand	11	1.8 (1.1 - 3.3)	0.6	5.0
	LPG		1.9 (0.9 - 2.6)	0.5	3.8
	MSG	13	1.9 (1.0 - 2.6)	0.5	4.3
	LPG		1.9 (1.0 - 2.6)	0.5	3.8

Key:

MSH – Management Sciences for Health

PBS – Pharmaceutical Benefit Scheme

IQR – interquartile range

MPR – median price ratio

MSG – most sold generic equivalent

LPG – lowest priced generic equivalent

Annex 5. Median price ratios of individual medicines in the survey

Median price ratios (MPRs) of the survey medicines as innovator brands, most sold generics and lowest priced generics in public procurement at Central Medical Stores (CMS) and 25 private pharmacies in Kuwait

Medicine Name	Core List?	Medicine median price ratios (MSH reference prices)					
		Brand		MSG		LPG	
		CMS (n=1)	Private (n=25)	CMS (n=1)	Private (n=25)	CMS (n=1)	Private (n=25)
Acetylsalicylic acid	no	-	28.7	-	-	9.1	-
Aciclovir	yes	-	29.0	-	-	1.6	-
Amitriptyline	yes	-	14.6	-	-	3.4	-
Amoxicillin	yes	-	29.4	-	-	1.1	-
Atenolol	yes	-	50.2	-	47.4	2.5	47.4
Beclometasone inhaler	yes	-	3.7	-	-	0.5	-
Captopril	yes	-	15.3	-	16.0	0.3	16.0
Carbamazepine	yes	4.2	15.6	-	-	-	-
Carvedilol	no	-	-	-	-	-	-
Ceftriaxone injection	yes	-	9.8	-	8.6	1.4	8.6
Cephalexin	no	-	-	-	-	0.4	-
Chlorpromazine	no	-	-	-	-	-	-
Ciprofloxacin	yes	-	110.2	-	100.1	0.8	100.1
Co-trimoxazole suspension	yes	-	-	-	14.6	0.5	14.6
Diazepam	yes	-	-	-	-	22.2	-
Diclofenac	yes	-	90.5	-	83.9	0.8	60.7
Fluconazole	no	-	-	-	-	-	-
Fluoxetine	yes	-	93.6	-	-	8.0	-
Gemfibrozil	no	-	-	-	-	-	-
Glibenclamide	yes	-	55.5	-	50.76	4.2	50.8
Gliclazide	no	-	-	-	-	-	-
Hydrochlorothiazide	yes	32.9	-	-	-	-	-
Ibuprofen	no	-	-	-	18.73	1.5	18.6
Indapamide	no	-	-	-	-	-	-
Insulin neutral	no	1.5	-	-	-	-	-
Lisinopril	no	0.6	6.8	-	-	-	-
Loratadine	no	-	6.2	-	5.6	1.3	5.6
Metformin	yes	-	5.3	-	4.8	0.4	4.8
Nifedipine Retard	yes	5.0	26.2	-	-	-	-
Omeprazole	yes	-	17.9	-	15.7	1.2	15.7
Paracetamol	no	-	17.0	-	14.9	1.4	14.9
Phenytoin	yes	5.3	8.7	-	-	-	-
Ranitidine	yes	-	18.7	-	16.1	0.1	14.1
Salbutamol inhaler	yes	1.2	7.9	-	-	-	-
Simvastatin	no	-	-	-	-	-	-

Key:

CMS – Central Medical Stores (procurement prices)

MSG – most sold generic equivalent

LPG – lowest priced generic equivalent