

Lebanon

Prices, availability, affordability and price components of medicines to treat non-communicable diseases

Medicine prices matter

Rapidly rising costs of health care and high medicine prices are a growing concern worldwide, especially in countries where patients often have to pay the full price of medicines. The burden is greatest for people with non-communicable diseases (NCDs) that require life-long treatment. This report about the prices, availability, affordability and price components of medicines to treat NCDs in Lebanon is an outcome of a series of surveys carried out in the World Health Organization's (WHO) Eastern Mediterranean region using a standard survey methodology developed by the WHO and Health Action International (HAI).

WHO/HAI methodology

The WHO/HAI methodologyⁱ, published as a manual with accompanying Excel workbooks for data entry and analysis, is a facility-based survey with data collected for selected medicines in at least six geographic or administrative areas in a sample of public health facilities, registered private pharmacies, and optionally in medicine outlets in other sectors (eg. private hospitals). Data are also collected on government procurement prices. The methodology assesses medicine affordability as the number of days the lowest paid unskilled government worker would have to work to pay for 30 days treatment for NCD medicines using standard treatment regimens or 7 days for acute conditions. It also estimates the add-on costs (mark-ups, taxes etc.) that contribute to the final patient price by tracking these backwards through the distribution chain for some tracer medicines.

Survey objectives

The NCD surveys in the region were designed to answer the following questions on medicines to treat NCDs:

- What is the availability and patient price for key NCD medicines?
- How affordable are medicines for low-income people, for the treatment of common NCDs?
- Do prices, availability and affordability for NCD medicines vary within and across sectors (for originator brands, most sold generic and lowest priced generics), and in different regions of the country?
- What price does the government pay for medicines?
- How do government procurement prices for NCD medicines compare with patient prices in the public sector?

- How do prices compare with international reference prices?
- What is the out-of-pocket payment for each medicine procured?
- What charges are added to medicines in the supply chain in the public and private sectors (mark-ups, taxes etc.)?

Lebanon survey

The survey in Lebanon was conducted in July 2013 by the Ministry of Public Health (MOPH). The survey manager was Dr. Rita Karam. Dr Walid Ammar, Director General, MOPH co-authored this report. Support for the survey was provided by the World Bank, WHO's Eastern Mediterranean Regional Office and HAI.

Pharmaceutical sector in Lebanonⁱⁱ

Lebanon is a relatively small country in size (10452 sq. km) with a population of just over 4.4 million people (2012) living in six administrative provinces. The majority (85%) of people live in urban locations, 38% of whom are in Mount Lebanon.

Health expenditure as a share of GDP was 8.4% (2011). In 2011, only 2.67% of the government budget was spent on health. Of this, 20.8% (110 billion LBP) was spent on medicines (up from 15% in 2009). Per capita pharmaceutical spending was estimated at \$299.10 in 2012. Out-of-pocket expenditure was 44% of total health expenditure. Almost half of household healthcare expenditure is on medicines.

Approximately 95% of medicines by volume are imported (predominately from Europe) although there are 11 local manufacturers.

The Department of Pharmacy at the MOPH undertakes medicines regulatory activities. All medicinal products must have marketing approval (registration) before importation or before being sold. In 2013, 6697 products were registered (more than 350 products are registered annually). Of the registered products, 4600 are estimated to be on the market. The Lebanese Essential Medicines List (EML) was published in 2002 and is currently being revised (due for publication in 2014).

Approximately half of Lebanon's population does not have health insurance. There are six employment-based publicly managed social insurance funds in Lebanon, four of which are military schemes. The other two are the National Social Security Fund (NSSF) which is the largest fund covering

1,077,683 private sector beneficiaries and 492,085 adherents, reimburses 80% percent of medicines costs. The Cooperative of Civil Servants (CCS) covers public sector employees and reimburses 75% of medicine costs.

The MOPH covers hospital inpatient costs (including medicines) for the uninsured, and provides outpatients with medicines free-of-charge for debilitating diseases such as cancer, HIV/AIDS, multiple sclerosis etc. through its Central Warehouse or Drug Dispensing Center. The MOPH has strengthened access to primary healthcare through a large network of Primary Health Care (PHC) centers in collaboration with NGOs. The MOPH procures vaccines and essential medicines for the PHC network from UNICEF and YMCA. YMCA implements the National Chronic Drugs Program on the behalf of the MOPH and in 2011 had 162,016 registered beneficiaries. Of these, 32.9% had cardiovascular disease, followed by hypertension (16.9%), hyperlipidemia (16.1%), and diabetes (14.8%); 64% of the beneficiaries having more than one chronic condition and 16% having 4 or more. The National Chronic Drugs Program includes 63 medicines. PHC centers provide medicines free-of-charge.

The MOPH sets patient prices in the private sector (published on their website), and the mark-ups of importers and pharmacies (for imported medicines only). The patient price is based on the registration price, plus the regulated mark-ups. The first price review is conducted 5 years after the product is registered. The next price review is undertaken after a further 5 years and includes all generic equivalents (but not therapeutic equivalents). With the exception of narcotics, most medicines can be purchased in pharmacies without a prescription in spite of a law requiring the use of a prescription. Generic substitution by pharmacists is legally permitted in Lebanon.

Survey methodology

A total of 54 medicines were surveyed; 21 were from a list used in the NCD surveys in the region (with pre-set strengths, dosage forms and recommended pack sizesⁱⁱⁱ) plus 33 were selected due to national importance (also strength and dosage form specific, and recommended pack sizes). Note: different strengths and dosage forms of the survey medicines, and therapeutic alternatives may be on the market (but were not included in the survey).

Prices and availability were recorded for the originator brand product (OB) and most sold generic equivalent (MSG) both of which were identified at the national level; and for the lowest priced generic equivalent (LPG) product which was determined at each outlet. Most sold generic products were identified using IMS Health sales volume data for the private sector (so does not apply to the public sector).

Of the 54 survey medicines, 3 were older products with no identifiable originator brand, 4 originator brand products were registered but not marketed in Lebanon at the time of the study, and 4 medicines had no registered generics at the time of the survey.

The 54 medicines were separated into a main list (48) and a list of cancer medicines (6). Data was collected for the 48 main list medicines from a total of 30 PHC centers and 30 private pharmacies in the capital Beirut and 5 other regions of the country: Mount Lebanon, Bekaa, South Lebanon, North Lebanon and Nabatieh.

Data for the 6 cancer medicines were collected in a total of 18 private hospitals in the survey regions that treat cancer, and from the MOPH's Central Warehouse in Beirut that dispenses cancer medicines free-of-charge to patients without health insurance or other coverage. The availability of diazepam and morphine in private pharmacies was based on those licensed to dispense antipsychotics and narcotics.

Public sector procurement prices were obtained from UNICEF and YMCA, and the MOPH's Central Warehouse for the cancer medicines surveyed.

Data on mark-ups in the supply chain were collected centrally, based on the current medicine pricing regulations. For 3 tracer medicines, price components for the OB, MSG and LPG were collected in 1 urban and 1 rural private pharmacy and tracked back in the supply chain to determine the mark-ups of the retailers, wholesalers, importers etc. plus any other charges.

Analyses restricted to medicines on the EML were not undertaken as the list is being updated.

Presentation of price information

The WHO/HAI survey methodology presents prices in local currency (Lebanese Pound) and as median price ratios (MPR). The MPR is calculated by dividing the local price by an international reference price (converted to Lebanese Pounds). An MPR of 1 means the local price is equivalent to the reference price whereas an MPR of 2 means the local price is twice the reference price.

The international reference prices used for this survey were taken from the 2012 Management Sciences for Health (MSH) International Drug Price Indicator Guide^{iv} (the MSH Guide pulls together information from recent price lists of not-for-profit and for-profit medicine suppliers for multisource medicines and thus reflects the prices governments could be expected to pay when tendering for medicines). One survey medicine, bisoprolol 5mg tab, did not have an international reference price.

Table 1. Measurements in each sector

Measurement	Public sector	Private pharmacies	Private hospitals*	Central warehouse*
Price to patient	zero cost	✓	✓	zero cost
Availability	✓	✓	✓	✓
Affordability	zero cost	✓	✓	zero cost
Procurement price	✓	Not measured		✓
No. of outlets visited	30	30	18	1

*Cancer medicines only

Interpretation of findings

Country specific factors such as pricing policies, market size, competition, national economic and other factors may influence prices. For the purposes of these surveys, in low- and middle-income countries an MPR of less than or equal to 1 for public sector procurement prices are considered to indicate acceptable prices.

Findings

1. PUBLIC SECTOR

1.1 Public sector procurement prices

Medicines procured by UNICEF and YMCA

Across the 48 medicines in the main list, UNICEF and YMCA procured 22 of them, all as generics. Across the 21 medicines procured that had an international reference price, lowest priced generics were 1.95 times international reference prices, with an interquartile range of 1.35 to 3.30 (as shown in Table 2). Overall, procurement prices are reasonable as suppliers are required to limit pack sizes for NCD medicines to no more than one month's supply, and blister-package all medicines (whereas international reference prices usually include bulk loose-packs).

Table 2. Summary of Median Price Ratios (MPR): UNICEF & YMCA procurement prices compared to international reference prices

	Originator brand	Lowest priced generic
Median MPR (interquartile range)		1.95 (1.35-3.30)
Minimum		0.14
Maximum		8.18
No. of medicines	0	21

Four medicines were procured at prices below international reference prices (isosorbide dinitrate, levothyroxine, digoxin and salbutamol inhaler). However, a few medicines were procured at much higher prices (such as diclofenac, fluoxetine and simvastatin) as shown in Table 3. For medicines with the highest multiples of international reference prices there could be opportunities for buying from lower price sources.

Two medicines were procured by both organisations. In both cases, UNICEF was buying at lower prices than YMCA.

Table 3. Median Price Ratios: examples of high and low UNICEF & YMCA procurement prices (LPG) compared to international reference prices

Medicine & procurer	MPR
Diclofenac 50mg - YMCA	8.18
Fluoxetine 20mg -YMCA	7.08
Simvastatin 20mg - YMCA	5.95
Digoxin 0.25mg – YMCA	0.57
Levothyroxine 100mcg - YMCA	0.18
Isosorbide dinitrate 10mg - YMCA	0.14

LPG=lowest priced generics, tab/cap unless otherwise stated

MOPH procured cancer medicines (Central Warehouse)

Overall originator brands of the cancer medicines surveyed were 1.69 times the reference price (n=3). Lowest priced generics were 0.92 times (i.e. 8% less) than the reference price (n= 3). Table 4 shows the medicine price ratios for individual medicines.

Table 4. Median Price Ratios: MOPH procurement prices for individual cancer medicines compared to international reference prices

Medicine and product type	MPR
Anastrozole 1mg tab - OB	1.69
Capecitabine 500mg tab - OB	1.02
Docetaxel 20mg inj – LPG	0.49
Doxorubicin 10mg inj - OB	2.60
Gemcitabine 200mg inj – LPG	0.92
Oxaliplatin 50mg inj - LPG	1.21

OB= originator brand, LPG=lowest priced generics

1.2 Medicine availability in the public sector

Note: at the time of the survey Lebanon experienced a massive influx of refugees from Syria putting a heavy burden on the supply of medicines in the public sector. Therefore, it was expected that medicine availability in PHC centers would be lower than prior to the influx of refugees.

All main list medicines

The mean availability of surveyed medicines on the main list in the PHC centers was 1.5% for originator brands and 42.0% for generics – see Table 5. The mean availability was 43.3% for any product type^v.

Table 5. Mean availability in PHCs – all main list medicines

	Originator brand	Lowest priced generic
All main list medicines (n=48)		
Mean availability	1.5%	42.0%
Standard deviation	7.2%	36.3%

Note:

- UNICEF and YMCA were only procuring 22 of the survey medicines. Of the survey medicines not procured, a number of therapeutic alternatives are being procured and supplied to patients in PHC centers.
- low availability of originator brands no longer on patent (i.e. generics are available) is expected in the public sector and reflects procurement efficiency.

Table 6 lists the availability of individual medicines (across six percentage availability bands) in PHC centers - nearly all of which were generics.

Morphine 30mg SR tablets and 15mg ampoules were not found in any of the 30 PHC centers surveyed, and the two neuroleptics (clozapine and risperidone) had very poor availability. Oral diabetes medicines had good availability (over 85%) but vials of isophane and regular insulin were available in only 50% and 20% of PHC centers respectively (any product type).

All medicines with less than 50% availability in PHC centers were not procured via UNICEF or YMCA, but are either donations or charities from other organizations.

Table 6. Availability of individual medicines in PHC centers (any product type)

Availability	Medicine
0 %	Clozapine, diazepam, epoetin alpha inj, gabapentin, hydrocortisone sod succ inj, morphine tab & inj
1-24%	Acetyl salicylic acid, atorvastatin, bisacodyl, budesonide inhaler, carvedilol, enalapril, hydrochlorothiazide, lamotrigine, losartan, soluble insulin vial, paroxetine, risperidone, sertraline, tamoxifen, timolol eye drops
25 -49%	Omeprazole, prednisolone
50 – 79%	Amitriptyline, carbamazepine, clopidogrel, diclofenac, digoxin, diltiazem, fluoxetine, isophane insulin vial, isosorbide dinitrate, levothyroxine, propranolol, ranitidine, salbutamol inhaler
80-99%	Amiodarone, amlodipine, atenolol, bisoprolol, captopril, furosemide, glibenclamide, ibuprofen, metformin, paracetamol, simvastatin
100%	-

tab/cap unless otherwise stated

Medicines procured by UNICEF and YMCA

The mean availability in the PHC centers of the medicines procured by UNICEF and YMCA (22 medicines in total) was 75.4% (all were generics) as shown in Table 7.

Table 7. Mean availability in PHC centers of medicines procured by UNICEF and YMCA

	Originator brand	Lowest priced generic
Medicines procured by UNICEF & YMCA		
Mean availability	-	75.4%
Standard deviation	-	13.1%

Table 8 shows the availability of individual medicines across the six percentage availability bands.

Table 8. Availability in PHC centers of individual medicines (generics) procured by UNICEF and YMCA

Availability	Medicine
0 %	-
1-24%	-
25 -49%	-
50 – 79%	Amitriptyline, carbamazepine, diclofenac, digoxin, diltiazem, fluoxetine, isosorbide dinitrate, levothyroxine, propranolol, ranitidine, salbutamol inhaler
80-99%	Amiodarone, amlodipine, atenolol, bisoprolol, captopril, furosemide, glibenclamide, ibuprofen, metformin, paracetamol, simvastatin
100%	-

tab/cap unless otherwise stated

Cancer medicines in the Central Warehouse

From its Central Warehouse, the MOPH dispenses cancer medicines free-of-charge to uninsured cancer patients and those with no other cover. All six cancer medicines surveyed were available in the warehouse (100%);

- Originator brands only: anastrozole and capecitabine tabs
- Originator brand and generics: doxorubicin vials

- Generics only: docetaxel, gemcitabine and oxaliplatin vials

2. PRIVATE RETAIL PHARMACIES

2.1 Medicine availability in private pharmacies

The mean availability of all surveyed medicines on the main list in the private pharmacies was 85.6% for originator brands, 68.6% for most sold generics, and 77.9% for lowest priced generics (as shown in Table 9). The mean availability was 87.2% for any product type.

Table 9. Mean availability in private pharmacies

	Originator brand	Most sold generic	Lowest priced generic
All main list medicines (n=48)			
Mean availability	85.6%	68.6%	77.9%
Standard deviation	24.1%	33.0%	30.4%

Tables 10 and 11 list the availability of originator brands and generics in the private pharmacies. Thirty-four (34) of the 48 surveyed medicines had 80% or higher availability as generics, of which 14 had 100% availability. Morphine tablets and injection, and clozapine, had very poor availability in the private sector.

Table 10. Availability of originator brands, private pharmacies

Availability	Medicine
0 %	Epoetin alpha inj
1-24%	Clozapine
25 -49%	Glibenclamide, hydrocortisone sod succ inj
50 – 79%	Budesonide inh, diazepam, isophane insulin vial
80-99%	Amitriptyline, atenolol, atorvastatin, bisacodyl, carbamazepine, carvedilol, clopidogrel, digoxin, diltiazem, enalapril, fluoxetine, furosemide, gabapentin, lamotrigine, losartan, soluble insulin vial, paroxetine, propranolol, risperidone, simvastatin, timolol eye drops
100%	Acetyl salicylic acid, amiodarone, amlodipine, bisoprolol, captopril, diclofenac, ibuprofen, levothyroxine, metformin, paracetamol, ranitidine, salbutamol inh, sertraline

tab/cap unless otherwise stated

Table 11. Availability of generics, private pharmacies

Availability	Medicine
0 %	Clozapine
1-24%	Hydrocortisone sod succ inj, lamotrigine, morphine tab & inj
25 -49%	Carbamazepine, carvedilol
50 – 79%	Bisacodyl, budesonide inh, diltiazem, epoetin alpha inj, isophane insulin vial, soluble insulin vial, risperidone
80-99%	Amiodarone, atorvastatin, captopril, clopidogrel, furosemide, gabapentin, glibenclamide, isosorbide dinitrate, losartan, paroxetine, propranolol, ranitidine, salbutamol inh, sertraline, tamoxifen, timolol eye drops
100%	Acetyl salicylic acid, amlodipine, atenolol, bisoprolol, diclofenac, fluoxetine, hydrochlorothiazide, ibuprofen, levothyroxine, metformin, omeprazole, paracetamol, prednisone, simvastatin

tab/cap unless otherwise stated

WHO has set a target of 80% availability for generic NCD medicines in the public and private sector. As shown in Table 6, on the day of data collection, in the public sector 36 of the 48 medicines (75%) did not achieve 80% availability. In the private sector, 14 medicines (29%) did not achieve this target (as shown in Table 11). Clozapine, hydrocortisone sod succ inj, morphine tab & inj, carbamazepine, carvedilol, bisacodyl, budesonide inhaler, diltiazem, epoetin alpha inj, isophane insulin, soluble insulin and risperidone had less than 80% availability as generics in both sectors.

2.2 Patient prices in private pharmacies

Note: 50% of the population have insurance coverage and 25% obtain medicines free-of-charge from PHC centers (public sector). At least 25% of the Lebanese population (i.e. 1 million people) purchase medicines out-of-pocket from private retail pharmacies without being reimbursed.

Across the 30 private pharmacies surveyed, prices were 12.06, 7.84 and 6.70 times the international reference price for originator brand medicines, most sold generics and lowest priced generics respectively (Table 12). In interpreting this data it must be remembered that international reference prices are bulk procurement prices so in the private sector it would not be expected that patients are paying international reference prices. Manufacturer's selling prices are usually higher for smaller quantities, and distribution chain costs will apply. It is important to consider the affordability of medicines (see below) as that helps determine if patient prices in the private sector are reasonable or not.

Table 12. Summary of Median Price Ratios (MPR): patient prices in the private sector compared to international reference prices

	Originator brand	Most sold generic	Lowest priced generic
Median MPR (interquartile range)	12.06 (6.46-19.63)	7.84 (3.40-13.46)	6.70 (3.80-9.30)
Minimum	1.38	1.00	0.84
Maximum	76.73	68.41	26.44
No. of medicines	39	37	38

The median price of the 39 originator brands found in the private sector was about 12 times the international reference price, with some medicines significantly higher at over 40 times the international reference price (diclofenac, clopidogrel, glibenclamide, fluoxetine and furosemide).

Overall most sold generic equivalents were 7.84 times the international reference price, ranging from isosorbide dinitrate at the same price as the reference price to some which were significantly higher. Six medicines were over 20 times the international reference price (diclofenac, fluoxetine, acetyl salicylic acid, simvastatin, omeprazole and hydrochlorothiazide).

Lowest priced generic equivalents were 6.7 times the international reference price, with isosorbide dinitrate 16%

lower and many medicines much higher (diclofenac, fluoxetine, acetyl salicylic acid and hydrochlorothiazide were over 20 times the international reference price).

Table 13 lists those medicines with the highest multiples of international reference prices where there could be opportunities for buying and selling at lower prices.

Table 13. Median Price Ratios (MPR): examples of medicines with high patient prices in the private sector compared to international reference prices

	Originator brand	Most sold generic	Lowest priced generic
Diclofenac 50mg	76.73	68.41	24.13
Clopidogrel 75mg	41.00	15.71	10.82
Glibenclamide 5mg	54.33	8.69	9.48
Fluoxetine 20mg	49.61	34.24	21.94
Furosemide 40mg	46.59		7.92
Acetyl salicylic acid 100mg	36.57	21.27	21.27
Simvastatin 20mg	35.57	25.46	6.52
Omeprazole 20mg		29.38	18.15
Hydrochlorothiazide 25mg		26.44	26.44

tab/cap unless otherwise stated

Price variation by medicine

There was little variation in prices across pharmacies for originator brands and most sold generics (identical products were surveyed across the pharmacies). A few lowest priced generics showed price variation, which may be due to different products found in the pharmacies or delays in pharmacies revising patient prices (the MOPH updates the patient price list every two weeks as foreign exchange rates fluctuate). As shown in Table 14, the greatest variation was seen for lowest priced generics of bisacodyl where the 25th and 75th percentiles ranged from 7.34 to 22.10 (high priced for this sector).

Table 14. Price variation in private pharmacies for some lowest priced generics (patient prices compared to international reference prices)

Medicine and product type	Median	25 th percentile	75 th percentile
Atorvastatin 20mg - LPG	6.28	2.61	7.13
Bisacodyl 5mg- LPG	7.54	7.34	22.32
Metformin 850mg - LPG	5.00	3.52	6.66
Ranitidine 150mg - LPG	6.37	6.37	11.55

LPG=lowest priced generics; tab/cap unless otherwise stated

Price variation by product type

Using matched medicines pairs, originator brands were on average 1.6 times (60%) more than the price of most sold generics, and 1.8 times (80%) more than the price of lowest-priced generics (Table 15). Most sold generics were on average 20% higher priced than lowest priced generics.

Table 15. Ratio matched pairs of product types, private pharmacies

	Ratio
Originator brand: most sold generic (n=31 medicines)	1.6
Originator brand: lowest priced generic (n=32 medicines)	1.8
Most sold generic: lowest priced generic (n=37 medicines)	1.2

2.3 Medicine affordability in private pharmacies

Medicine affordability was assessed for around 25% of the population without insurance coverage and who do not obtain medicines from PHC centers (where they are free-of-charge), hence have to pay the full medicine price out-of-pocket in the private sector.

Affordability is calculated as the number of days the lowest paid unskilled government worker would have to work to pay for 30 days treatment for NCD medicines. At the time of the survey, the daily wage (also the national minimum wage) was 22500 Lebanese Pounds [equivalent to US\$ 14.93 per day]^{vi}.

Needing to spend more than 1 day's income per month on family medicine needs could be considered to be unaffordable. Table 16 lists how many days this worker would have to work to purchase various treatments.

Table 16. Affordability: number of days' wages needed to purchase standard treatments

Medicine & number of units	Days' wages needed to purchase from private pharmacies
Diabetes	
Glibenclamide 5mg x60	0.9 OB / 0.1 MSG / 0.2 LPG
Metformin 850mg x60	1.0 OB / 1.0 MSG / 0.4 LPG
Isophane insulin 100IU 10ml	1.1 OB / 0.7 MSG / 0.7 LPG
Regular insulin 100IU 10ml	1.1 OB / 0.7 MSG / 0.7 LPG
Cardiovascular disease	
Amiodarone 200mg x30	0.6 OB / 0.5 MSG / 0.5 LPG
Amlodipine 5mgx30	1.0 OB / 0.7 MSG / 0.7 LPG
Bisoprolol 5mgx60	1.5 OB / 1.0 MSG / 0.4 LPG
Captopril 25mgx60	1.3 OB / 0.7 MSG / 0.7 LPG
Carvedilol 25mg x30	0.7 OB / 0.6 MSG / 0.6 LPG
Diltiazem 60mg x90	1.1 OB / 0.7 MSG / 0.7 LPG
Enalapril 5mgx60	0.9 OB
Losartan 50mgx30	2.4 OB / 1.7 MSG / 1.7 LPG
Hydrochlorothiazide 25mg x30	03 MSG / 0.3 LPG
Atorvastatin 20mg x30	2.6 OB / 1.2 MSG / 1.0 LPG
Simvastatin 20mg x30	1.8 OB / 1.3 MSG / 0.3 LPG
Acetyl salicylic acid 100mg x30	0.2 OB / 0.1 MSG / 0.1 LPG
Clopidogrel 75mg x30	6.1 OB / 2.3 MSG / 1.6 LPG
Respiratory disease	
Budesonide 200mcg/dose x1 inhaler (200 doses)	4.1 OB / 2.2 MSG / 2.2 LPG
Salbutamol 100mcg/dose x1 inhaler (200 doses)	0.4 OB / 0.3 MSG / 0.3 LPG
Mental health / neuroleptic disorders	
Amitriptyline 25mg x90	0.4 OB
Fluoxetine 20mg x30	3.5 OB / 2.4 MSG / 1.6 LPG
Paroxetine 20mg x30	1.9 OB / 1.3 MSG / 1.3 LPG
Sertraline 50mg x30	1.1 OB / 0.9 MSG / 0.9 LPG
Clozapine 100mg x90	7.9 OB
Risperidone 2mg x90	4.2 OB / 2.8 MSG / 2.9 LPG
Palliative care	
Morphine 30mg SR x60	2.0 MSG / 2.0 LPG
Morphine 15mg injection x180	14 MSG / 14 LPG
Other NCDs	
Epoetin alpha 4000IU inj x12	18.6 MSG / 18.6 LPG
Gabapentin 300mg x180	7.6 OB / 5.9 MSG / 5.4 LPG

Lamotrigine 25mg x180	7.3 OB
Carbamazepine 200mgx90	1.5 OB / 0.8 MSG / 0.8 LPG
Diclofenac 50mg x60	2.0 OB / 1.8 MSG / 0.6 LPG
Omeprazole 20mg x30	1.4 MSG / 0.9 LPG
Cancer medicines	Private hospitals
Docetaxel 20mg vial x12	192 OB / 120.3 LPG
Doxorubicin 10mg vial x18	7.2 MSG / 7.3 LPG
Gemcitabine 200mg vial x27	84.6 MSG / 81.4 LPG
Oxaliplatin 50mg vial x6	141.7 OB / 95.1 LPG
Tamoxifen 20mg tab x30	Private pharmacies: 0.5 MSG / 0.5 LPG

OB – originator brand; MSG – most sold generic; LPG – lowest priced generic. tab/cap unless otherwise stated

For most treatments, no more than 1 days' wages are needed when buying lowest priced generics. However, medicines for a number of treatments were less affordable if originator brands were purchased e.g. atorvastatin (hypercholesterolaemia) requires 2.6 days wages if the originator brand (Lipitor) is purchased but only 1 days' wages if using lowest priced generics; for clopidogrel (thrombosis) the difference was 6.1 and 1.6 days wages for the originator brand (Plavix) and lowest priced generics respectively.

For a couple of medicines (simvastatin and diclofenac) the most sold generic was less affordable than the lowest priced generic (e.g for simvastatin the most sold generic required 1.3 days' wages whereas the lowest priced generic required 0.3 days' wages).

Neuroleptics (clozapine and risperidone) were less affordable, whether originator brands or generics, at 2.9 to 7.9 days' wages depending on the medicine and product type purchased. Budesonide inhaler to prevent asthma was far less affordable than salbutamol inhaler (used to treat asthma). The affordability of medicines in some therapeutic classes showed significant variability e.g. treating depression with amitriptyline or sertraline is far more affordable than using fluoxetine or paroxetine.

Co-morbidities are common among NCD patients. Should a person on the national minimum salary need treatment for hypertension, diabetes and hypercholesterolaemia, then they would have to use 0.7 to 6 days wages every month to purchase medicines, depending upon the choice of medicine and product type^{vii}. This scenario only represents the medicine needs for one person in a family and hence the burden would be much greater if other family members need medicines.

All cancer IV treatments, taken for 30 days using standard regimens for a person of normal height and weight, would be unaffordable when purchased from private hospitals. Cancer treatments are free-of-charge in the public sector. Tamoxifen tablets require less than one days' wages when purchased from private pharmacies.

3. PRIVATE HOSPITALS (cancer medicines only)

3.1 Availability of cancer medicines in private hospitals

In the 18 private hospitals surveyed that treat cancer, the availability of the four injectable cancer medicines

surveyed was 41.7%, 16.7% and 58.3% for originator brands, most sold generics and lowest priced generics respectively (as shown in Table 17). Availability was 81.9% for any product type. Note: the two oral cancer medicines in the survey (anastrozole and capecitabine tabs) are not provided by private hospitals.

Table 17. Availability of four IV cancer medicines in private hospitals

	Originator brand	Most sold generic	Lowest priced generic
Mean availability	41.7%	16.7%	58.3%
Standard deviation	30.6%	10.1%	21.5%

The availability of individual injectable cancer medicines is shown in Table 18. Lowest priced generic gemcitabine had the highest availability at 83.3%.

Table 18. Availability of individual cancer medicines in private hospitals

	Originator brand	Most sold generic	Lowest priced generic
Docetaxel 20mg inj	77.8%	5.6%	50.0%
Doxorubicin 10mg inj	11.1%	27.8%	33.3%
Gemcitabine 200mg inj	22.2%	22.2%	83.3%
Oxaliplatin 50mg inj	55.6%	11.1%	66.7%

3.2 Patient prices for cancer medicines in private hospitals

Over the four injectable cancer medicines surveyed in private hospitals, originator brands (n=2) had a median MPR of 5.24. Most sold generics had a median MPR of 3.51 (n=2). Data was available for 4 lowest priced generics – they had a median MPR of 3.39 i.e. 3.39 times the international reference price. Table 19 shows the Median Price Ratios for the individual medicines.

Table 19. Median Price Ratios (MPR): patient prices in private hospitals compared to international reference prices

Medicine & product type		MPR	25 th percentile	75 th percentile
Docetaxel 20mg inj	OB	5.76	5.67	5.95
	LPG	3.61	3.60	3.66
Doxorubicin 10mg inj	MSG	2.29	2.28	2.36
	LPG	2.33	2.28	2.36
Gemcitabine 200mg inj	MSG	4.73	4.69	4.73
	LPG	4.55	3.79	4.57
Oxaliplatin 50mg inj	OB	4.71	4.71	4.88
	LPG	3.16	3.11	3.22

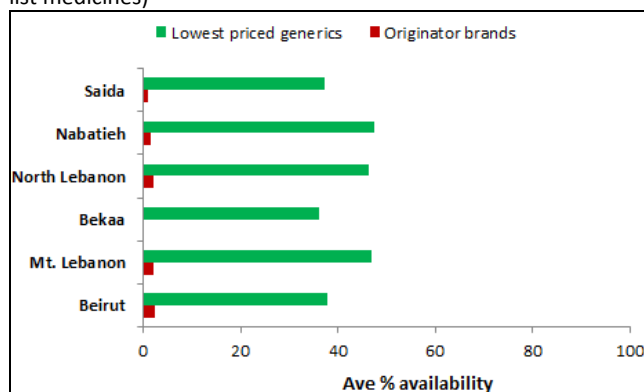
OB= originator brand, MSG=most sold generic, LPG=lowest priced generics

4. Cross region comparison of main list medicines

4.1 Availability in the public sector

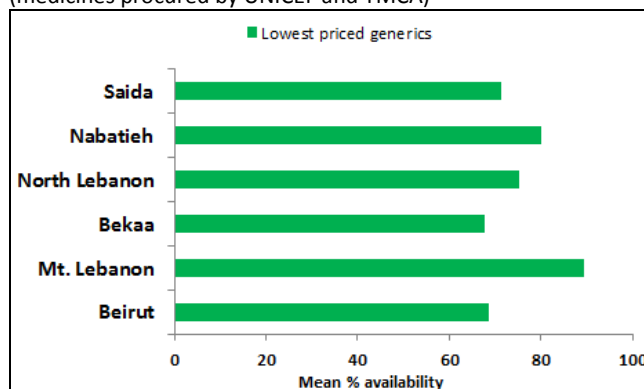
For medicines on the main list, mean availability in the public sector was highest for generics in Nabatieh (47.4%), Mount Lebanon (47%) and North Lebanon (46.5%) as shown in Figure 1. The availability was lower and similar in the other three regions (approximately 37%). The availability of originator brands was low in all regions.

Figure 1. Mean availability in the public sector by region (all main list medicines)



For the medicines procured by UNICEF and YMCA, mean availability in the public sector was highest in Mt Lebanon (89.5%) and Nabatieh (80.0%), and lowest in Bekaa (67.6%) and Beirut (68.6%) as shown in Figure 2.

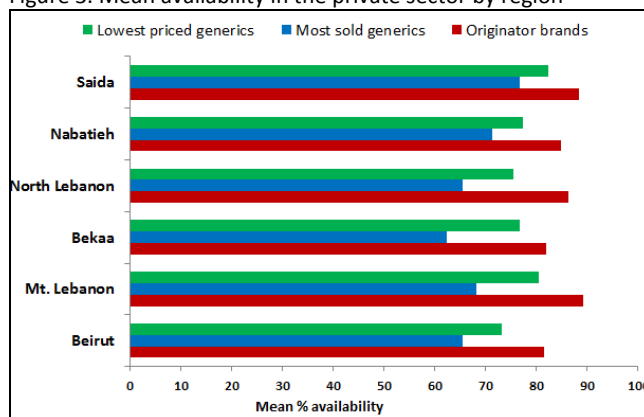
Figure 2. Mean availability in the public sector by region (medicines procured by UNICEF and YMCA)



4.2 Availability in private pharmacies

In private pharmacies, the mean availability of generics was lowest in Beirut (73.2%) and highest in Saida (82.3%) as shown in Figure 3. In all regions, originator brands were more available than generics.

Figure 3. Mean availability in the private sector by region

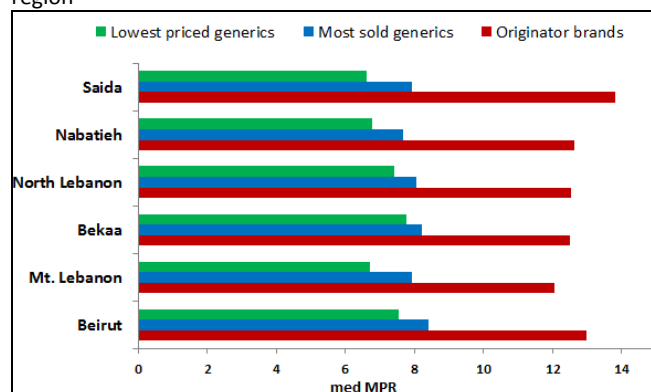


4.3 Patient prices in private pharmacies

Overall, patient prices in private pharmacies were highest for originator brands in Saida and lowest in Mount Lebanon although there was little variation (Figure 4). Prices of lowest priced generics were lowest in Saida,

Mount Lebanon and Nabatieh (median MPR about 6.7), and highest in Beirut, Bekaa and North Lebanon (median MPR about 7.6).

Figure 4. Summary of Median Price Ratios, private pharmacies, by region



A cross region comparison of the cancer medicines was not undertaken due to the small number of medicines surveyed.

6. Medicine price components in the private sector

The final price paid for a medicine, whether by the government or a patient, reflects the manufacturer's selling price (MSP) plus all the intervening price additions in the supply chain.

Price component data was collected centrally and in the field for 3 tracer medicines in private pharmacies, namely, atorvastatin 10mg tab, atenolol 50mg tab, and clopidogrel 75mg tab. Price components were not assessed in the public sector as medicines are supplied to patients free-of-charge.

Official mark-ups and other charges

For imported medicines, duties, mark-ups and other charges in the supply chain are applied regressively and grouped into four price segments (A,B,C and D). These charges are based on the Lebanese registered price which is either a Free on Board (FOB) price, or a Cost, Insurance and Freight (CIF) price^{viii}.

- A: medicines with a registered FOB price of up to \$10, or a CIF price up to \$10.70
- B: medicines with a registered FOB price of \$10 up to \$50, or a CIF price of \$10.70 up to \$52.20
- C: medicines with a registered FOB price of \$50 up to \$100, or a CIF price of \$52.50 up to \$104
- D: medicines with a registered FOB price of \$100 or more, or a CIF price of \$104 or more.

Table 20 shows the mark-ups and charges applied to each of the four price segments. Note: there are no regulated mark-ups or charges for locally manufactured medicines but it is currently being considered by the MOPH.

Table 20. Basis of conversion of the registered price to the patient price

Segment	Freight & insur. (FOB only)	Clearance, other		Importer mark-up	Pharmacy mark-up
		Without customs duties	Normal customs duties		
A	7%	6%	11%	10%	30%
B	5%	5%	10%	10%	30%
C	4%	3%	8%	9%	27%
D	3%	2.5%	7.5%	8%	24%

Observed mark-ups

As shown in Table 21, mark-ups did not exceed the regulated levels. There was no difference in the mark-ups between urban and rural areas. Note: generic atorvastatin imported from Jordan had a lower level of clearance (5%) as customs duties are not applied for medicines from Arab countries.

The greatest contribution to the final patient price for these medicines was the manufacturer's selling price (CIF/FOB) - ranging from approx. 59%-67% of the final patient price (as shown in Table 22).

While discounts, rebates and bonuses are illegal, a number of trade schemes (such as buy 3 get 1 free) were identified (but not for the tracer medicines).

Value added tax (VAT) and Goods and Services Tax (GST) are not applied to medicines in Lebanon.

Table 21. Observed charges and mark-ups, private pharmacies

Seg. type, U/R, FOB/CIF	Clear.	Import.	Pharm.	Cumulative
Atorvastatin 10mg tab				
B OB U CIF	10%	10%	30%	57.3%
B OB R CIF	10%	10%	30%	57.3%
A Gen U FOB	11%	10%	30%	69.84%
B Gen U FOB	10%	10%	30%	65.17%
B Gen R FOB	10%	10%	30%	65.17%
A Gen R FOB	5%	10%	30%	57.66%
Atenolol 50mg tab				
A OB U FOB	11%	10%	30%	69.84%
A OB R FOB	11%	10%	30%	69.84%
A Gen U FOB	11%	10%	30%	69.84%
A Gen R FOB	11%	10%	30%	69.84%
Clopidogrel 75mg tab				
C OB U FOB	8%	9%	27%	49.5%
C OB R FOB	8%	9%	27%	49.5%
B Gen U FOB	10%	10%	30%	65.17%
B Gen R FOB	10%	10%	30%	65.17%
B Gen R FOB	10%	10%	30%	65.17%

Gen-generic, OB-originator brand, U-urban. R-rural, Clear. - clearance, Import.-importers mark-up, Pharm.-pharmacy mark-up, Cumulative – cumulative mark-up

Table 22. Observed percentage contribution to the final patient price, private pharmacies

Segment prod type	MSP (CIF/FOB)	Freight & Ins.	Clear.	Import.	Pharm.	
Atorvastatin 10mg tab						
B	OB	63.57%	0%	6.36%	6.99%	23.08%
B	OB	63.57%	0%	6.36%	6.99%	23.08%
A	Gen	58.88%	4.12%	6.93%	6.99%	23.08%
B	Gen	60.55%	3.03%	6.36%	6.99%	23.08%
B	Gen	60.55%	3.03%	6.36%	6.99%	23.08%
A	Gen	63.43%	4.17%	3.33%	6.99%	23.08%
Atenolol 50mg tab						
A	OB	58.88%	4.12%	6.93%	6.99%	23.08%
A	OB	58.88%	4.12%	6.93%	6.99%	23.08%
A	Gen	58.88%	4.12%	6.93%	6.99%	23.08%
A	Gen	58.88%	4.12%	6.93%	6.99%	23.08%
Clopidogrel 75mg tab						
C	OB	66.89%	0%	5.35%	6.50%	21.26%
C	OB	66.89%	0%	5.35%	6.50%	21.26%
B	Gen	60.55%	3.03%	6.36%	6.99%	23.08%
B	Gen	60.55%	3.03%	6.36%	6.99%	23.08%
B	Gen	61.05%	3.06%	6.42%	6.35%	23.08%

Gen-generic, OB-originator brand, MSP-manufacturers selling price, Ins. – insurance, Clear. -clearance, Import.-importers mark-up, Pharm.-pharmacy mark-up

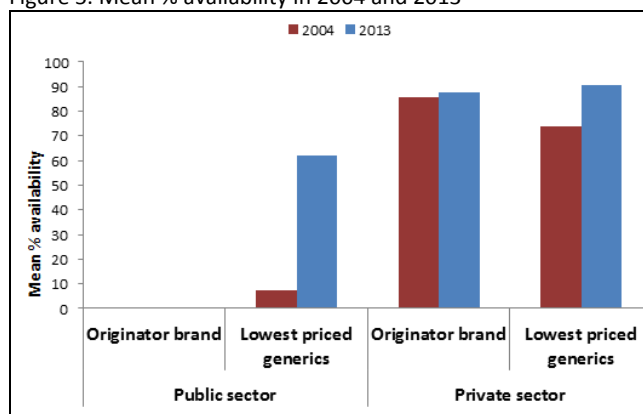
7. Comparison with 2004 survey findings

In 2004 a medicine price and availability survey was undertaken in Lebanon using the WHO/HAI methodology^{ix}. Fifteen (15) NCD medicines (same strength and dose form) were common to both the 2004 survey and to this 2013 survey. Medicine availability was compared in the public and private sector. Patient prices in private pharmacies were also compared (no adjustments were made for inflation etc).

7.1 Availability

In the public sector, the average availability of the generic versions of the 15 medicines has increased from 7.5% to 61.9% since 2004 (Figure 5). In the private sector, the availability of originator brands has showed little difference, while the availability of generics has increased from 73.7% to 90.5%.

Figure 5. Mean % availability in 2004 and 2013



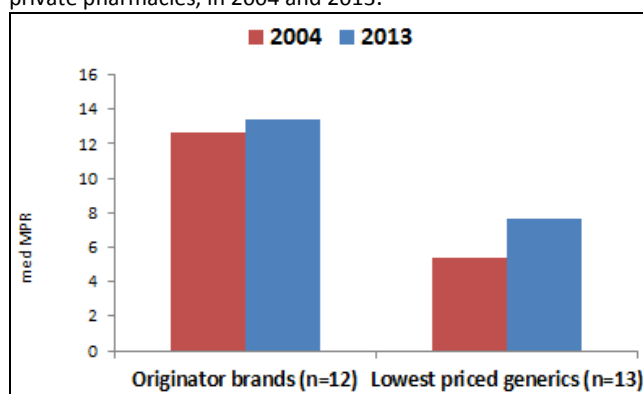
7.2 Public sector procurement prices

Across 10 medicines, public sector procurement prices of lowest priced generics were 1.21 times international reference prices in 2004. In 2013, public procurement prices were similar at 1.78 times international reference prices.

7.3 Patient prices in private pharmacies

Across the 12 originator brands for which there was data, patient prices in private pharmacies were similar in 2004 and 2013 – see Figure 6. Across 13 lowest priced generics, the median MPR was 5.41 in 2004 and 7.63 in 2013.

Figure 6. Summary of Median Price Ratios (MPR): patient prices in private pharmacies, in 2004 and 2013.



7.4 Medicine affordability in private pharmacies

As shown in Table 23, medicines are more affordable in 2013 compared to 2004 e.g. in 2004, 3 days' wages were needed to purchase 30 days' supply of the originator brand of captopril to treat hypertension, and 1.2 days' for the lowest priced generic. In 2013, the number of days' was reduced to 1.3 for the originator brand and 0.7 days for the lowest priced generic.

Table 23. Comparison of medicine affordability, private pharmacies, 2004 & 2013

Medicine and number of units	Days' wages needed to purchase from private pharmacies			
	2004		2013	
	OB	LPG	OB	LPG
Salbutamol 100mcg/dose inhaler	0.9	0.7	0.4	0.3
Glibenclamide 5mg x60	1.3	0.3	0.9	0.2
Captopril 25mg x60	3.0	1.2	1.3	0.7
Carbamazepine 200mg x90	2.7	1.3	1.5	0.8

Omeprazole 20mg x30		4.5		0.9
Atenolol 50mg x30	1.8	0.4	0.7	0.2

OB-originator brand, LPG-lowest priced generic

Summary of key findings from this survey

Main list medicines:

- Overall procurement prices were reasonable when taking into consideration Lebanese packaging requirements. However, a few individual medicines procured by YMCA were high priced.
- In the public sector, availability was good for the 22 medicines procured by UNICEF and YMCA (75.4%) especially considering the heavy burden on supply at the time of the survey due to the influx of Syrian refugees.
- Across all main list medicines, availability in PHC centers was low (43.3%). Of the medicines not procured by UNICEF and YMCA, therapeutic alternatives may be available in PHCs (these were not surveyed). Medicines with poor availability in PHC centers included morphine (0%) and insulin (regular 20%, isophane 50%). Factors causing poor availability in PHC centers may include limited financing and poor drug management in the supply chain.
- For the UNICEF/YMCA procured medicines availability was highest in Mt Lebanon (89.5%) and Nabatieh (80.0%), and lowest in Bekaa (67.6%) and Beirut (68.6%). The reasons for these regional differences may be explained by the distribution of displaced Syrians but require investigation.
- For the 25% of the population buying medicines out-of-pocket from private pharmacies with no reimbursement, standard treatments for lowest priced generics were generally affordable for those on low wages, except for some medicines to treat neuroleptic disorders. Among those people with co-morbidities, or where more than one household member has a NCD, medicines may be unaffordable for those on low wages resulting in people taking less than the prescribed amount or interrupting treatment so that their supply lasts longer, or going without treatment.
- In private pharmacies, originator brands were more available than generics (85.6% vs. 77.9%) and 80% higher priced than lowest priced generics. On average, most sold generics were 20% high priced than lowest priced generics. A few lowest priced generics were high priced and unaffordable.
- In all regions, originator brands were more available than generics in private pharmacies. Mean availability of generics was lowest in Beirut (73.2%) and highest in Saida (82.3%). Across regions, overall originator brands showed little price variations but prices of lowest priced generics were lower in Saida, Mount Lebanon and Nabatieh compared to Beirut, Bekaa and North Lebanon.
- Morphine was not found in any of the public sector outlets sampled, and in less than 20% of the private pharmacies licensed to dispense it, conforming to the licensing status of those facilities.

- Price components in the private sector supply chain (mark-ups etc.) did not exceed regulated levels. The largest contribution to the final patient price was the manufacturer's selling price (58%-66%). While discounts, rebates and bonuses are illegal, a number of trade schemes (e.g. buy 3 get 1 free) were identified (albeit not for the tracer medicines studied).

Cancer medicines:

- MOPH procurement prices were reasonable, and availability in the Central Warehouse was excellent. However, there were only a few cancer medicines in the analysis.
- Standard treatments using IV cancer medicines were unaffordable when purchased from private hospitals (even as lowest priced generics) however it is likely that patients in private hospitals have insurance coverage or are covered by the MOPH.

Survey results 2004 vs 2013:

- Since the 2004 medicine price and availability survey, the availability of generics has improved in both the public and private sectors.
- Public sector procurement price in 2013 of lowest priced generics were similar to procurement prices in 2004.
- Overall, patient prices of lowest priced generics increased, but prices of originator brands were similar.
- Medicines were more affordable in 2013 compared to 2004.

Recommendations

Based on the findings of this survey, the MOPH recommends the following actions in the priority order given and general timelines:

In progress:

- Update the national EML (to be published in last trimester of 2014) and review it every two years as recommended by WHO in its model list
- Increase the acceptance and use of lower-priced generics by:
 - strengthening the Department of Pharmacy of the MOPH (Medicine Regulatory Authority) to ensure all medicines on the market are quality-assured (through regular monitoring of manufacturers, and pre- and post-marketing product quality testing etc.)
 - educating the public and health professionals to build trust in the quality of registered medicines and promote the economic benefits of quality-assured lower-priced generic medicines.
 - identifying barriers to generic prescribing and generic substitution.

Quality Assurance of Pharmaceutical Products programme commenced in 2013, Action Plan 2013-2018 in progress.

- Reduce generic prices by implementing decisions already made by the MOPH that set patient prices for locally manufactured products, as well as agreed price reductions for all generics

- Investigate the availability and affordability of a wider group of medicines for mental health/neuroleptic disorders to ascertain if affordable therapeutic options are available.

Planned:

1. Increase government financing for the procurement of NCD medicines on the EML, including cancer medicines (short-term, about to be requested).
2. Undertake a procurement price comparison with neighbouring countries, reviewing prices, volumes, suppliers etc., as well as MSH's International Drug Price Indicator Guide (short-term, planned for last trimester 2014)
3. Review current medicine procurement practices to identify possible opportunities for obtaining more competitive prices (short-term, planned for last trimester of 2014)
4. Improve transparency by publishing government medicine procurement prices on the MOPH's website (longer-term)
5. Improve NCD medicine availability in PHC centres by:
 - Strengthening the drug management system to improve the supply of medicines and reduce stock-outs
 - Expanding the list of subsidized essential NCD medicines
 - Establishing a sustainable system to regularly monitor medicine availability at PHC centers
 - Expand the PHC network and improve the image of PHC centers to attract more beneficiaries (longer-term, planned for 2015)
6. Request WHO to hold a national or regional workshop on medicine pricing policy options to build capacity (longer-term, planned for 2015)
7. Review the method for setting the registration price, taking into consideration various options such as pharmaco-economic analyses for new single-source medicines, internal reference pricing and other options (longer-term, planned for 2015)
8. Improve medicine availability and affordability in the private sector by:
 - Investigating the extent of medicine discounting, rebating and bonusing
 - Regularly reviewing mark-ups levels for wholesalers and pharmacies
 - Establishing a sustainable system to regularly monitor patient prices, availability and affordability in the private sector to ensure policy changes result in improved affordability and availability (all longer-term)
9. Request WHO EMRO to establish a regional medicine procurement price exchange (longer-term, planned for 2015)
10. Regularly monitor medicine procurement prices internationally and develop a network amongst countries to regularly share prices in order to make better informed procurement decisions, to self-audit,

and to enhance bargaining powers especially for single-source NCD medicines (longer-term).

11. Conduct patient price reviews by therapeutic group (rather than by product) so similar medicines are co-considered and are priced relative to each other taking into account any therapeutic advantage (longer-term).
12. Determine the causes of differences in the availability of originator brands and generics in regions within the country. An expanded sampling frame is proposed (additional regions and additional pharmacies per region) with stratification by turnover, social and economic levels of patients, medicines/therapeutic groups etc. (longer-term).

Further information

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All the data can be found at
<http://www.haiweb.org/MedPriceDatabase/>

ⁱ WHO/HAI Measuring medicine prices, availability, affordability and price components, 2008; <http://haiweb.org/medicineprices/>

ⁱⁱ Data sources: Analysis of Lebanon's Pharmaceutical Market 2013; Business Monitor International, IFPMA 2010; Good governance in the Public Pharmaceutical Sector 2010; Lebanese Customs 2011; Ministry of Public Health, Statistical Bulletin 2012; National Health Statistics Report in Lebanon 2011; World Health report 2010 on Health Care Financing; World Health Statistics 2013; World Bank database <http://databank.worldbank.org/data/views/reports/tableview.aspx>

ⁱⁱⁱ Reflecting the burden of NCD disease and WHO's focus on cardiovascular disease, diabetes, respiratory disease and cancer in its NCD Global Plan of Action. <http://erc.msh.org>

^v Not counting availability twice when both originator and generic equivalents were found in the same outlet

^{vi} 1 USD = 1507 Lebanese Pounds (Bank of Lebanon)

^{vii} One antihypertensive (atenolol, amlodipine, bisoprolol, captopril, carvediolol, enalapril, losartan, hydrochlorothiazide or diltizem) one anti-diabetic (glibenclamide or metformin) and one antihypercholesterolaemia (simvastatin or atorvastatin)

^{viii} FOB and CIF are standard commercial terms used in the purchasing and shipping of goods internationally. FOB price means the seller pays for the transportation of the goods to the port of shipment plus loading costs. With CIF prices, the seller pays the costs, freight and insurance to bring the goods to the port of destination.

^{ix} See report on <http://www.haiweb.org/medicineprices/surveys.php>