# Ukraine

# Medicine prices, availability, affordability and price components

**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. This brief report about the prices and availability of essential medicines in Ukraine is one of a series of papers summarizing the results of medicine price and availability surveys carried out around the globe using a standard survey methodology developed by the World Health Organization and Health Action International[i].

This survey was conducted in March 2012 by the State Expert Centre of the Ministry of Health of Ukraine, with support from WHO's Ukraine Office and WHO's European Regional Office.

**Medicine price & availability survey**

The survey was designed to answer the following questions:

- How efficient are public sector procurement prices?
- What is the availability and patient prices of originator brand products, most sold generic equivalents and lowest priced generic equivalents in the public and private sectors?
- What is the difference in prices and availability in different regions of Ukraine?
- How affordable are medicines, for the treatment of common conditions, for people on low wages?
- What taxes are levied on medicines and what is the level of the various mark-ups that contributes to the retail price of medicines?

Of the 50 essential medicines that were surveyed, 14 were from the WHO/HAI global list of medicines with pre-set strengths, dosage forms and recommended pack sizes[ii], plus 36 were selected medicines of national importance. All medicines were on the national Essential Medicines List.

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) which was determined at each pharmacy. Of the 50 survey medicines, 38 had originator brand products registered in Ukraine. In the public sector pharmacies, full patient prices was recorded (although it is acknowledged that some medicines and/or patient groups receive medicines free-of-charge).

Data was collected from a total of 35 public sector pharmacies and 35 private pharmacies across 7 regions of the country: Kyiv, Vinnytsia, Dnipropetrovsk, Zhytomyr, Lviv, Poltava and Kharkiv.

Public sector procurement prices could not be obtained from the Ministry of Health.

Data was collected centrally on official policies related to medicine price components (mark-ups etc.). For 3 tracer medicines, wholesale and retail prices were collected from major retailers (those with more than 100 pharmacies) and major distributors (those with more than 4 pharmacy warehouses) to determine mark-ups in the private sector. However, determining all mark-ups and charges in the distribution chain, in the public and private sectors, was not possible.

**This survey found that in Ukraine:**

- The overall availability of generic medicines in public pharmacies (77%) and private pharmacies (81%) was quite good. Beclometasone and budesonide inhalers, essential medicines to control asthma, had poor availability in both sectors.
- Patient prices in public pharmacies were high for both originator brands and generics.
- Prices of originator brands and generics were similar in the public and private sector.
- In public and private pharmacies patients pay 500% and 276% more respectively for originator brands compared to lowest priced generics, and most sold generics were 27% and 41% higher priced than lowest priced generics.
- In the public sector, there was regional variation in the availability and prices of medicines. Availability of generics was highest in Kyiv and lowest in Vinnytsia, but lowest priced generics were higher priced in Vinnytsia and lowest in Kyiv. There was little variation in the price and availability of generics in the private sector.
- The affordability of medicines was similar in public and private pharmacies. For many treatments, patients on the minimum wage would require no more than 1 days' wages when buying lowest priced generics. However, medicines were less affordable if originator brands were purchased.
- In the public and private sectors, mark-ups were -13%-10% for wholesalers and 13%-24.5% for retailers. None exceeded maximum permitted levels.
- Overall private sector patient prices for lowest priced generics were lower in Ukraine compared to a selection of European countries, however, some originator brands were higher priced in Ukraine.

**Presentation of price information**

The WHO/HAI survey methodology presents prices in local currency (Hryvnia) and as median price ratios (MPR). The MPR is calculated by dividing the local price by an

international reference price (converted to lei). 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 2010 Management Sciences for Health (MSH) International Drug Price Indicator Guide[iii] (the MSH Guide pulls together information from recent price lists of large, multisource medicine suppliers and thus reflects the prices governments could be expected to pay for medicines); use of reference prices facilitates international comparisons.

Table 1. Measurements in each sector

| Measurement | Public sector | Private pharmacies |
|---|---|---|
| Price to patient | ✓ | ✓ |
| Availability | ✓ | ✓ |
| Affordability | ✓ | ✓ |
| No. of pharmacies visited | 35 | 35 |

**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 a low or middle income countries an MPR of less than or equal to 1 for public sector procurement prices are considered to indicate acceptable (not excessive) prices.

**Affordability**

Affordability is calculated as the number of days the lowest paid unskilled government worker (who earns the minimum wage in Ukraine) would have to work to pay for 30 days treatment for medicines for chronic conditions, and a 7 day treatment course for acute conditions. In March/April 2012, the minimum salary was 41.5915 Hryvnia per day [equivalent to approximately US$ 5.20 per day][iv].

Needing to spend more than 1 day's income per month on family medicine needs could be considered to be unaffordable. Table 2 lists how many days this worker would have to work to purchase various treatments.

Table 2. Affordability: number of days' wages to purchase standard treatment

| Medicine and number of units | Public sector pharmacies | Private pharmacies |
|---|---|---|
| Diabetes | | |
| Glibenclamide 5mg x60 | 0.3 MSG/0.2 LPG | 0.3 MSG/0.2 LPG |
| Gliclazide 80mg x30 | 0.9 OB / 0.6 MSG & LPG | 0.6 MSG & LPG |
| Metformin 500mg x90 | 2.0 OB / 1.6 MSG /1.4 LPG | 2.0 OB / 1.6 MSG /1.3 LPG |
| Hypertension | | |
| Amlodipine 5mgx30 | 4.2 OB / 1.8 MSG / 0.3 LPG | 4.2 OB / 1.7 MSG / 0.3 LPG |
| Atenolol 50mgx30 | 0.2 MSG/ 0.1 LPG | 0.2 MSG & LPG |
| Captopril 25mgx60 | 0.6 MSG/ 0.5 LPG | 0.5 MSG & LPG |
| Enalapril 10mgx60 | 3.8 OB / 0.4 MSG & LPG | 3.8 OB / 0.4 MSG & LPG |
| Losartan 50mgx30 | 3 OB / 1.3 MSG/ 1.0 LPG | 3.4 OB / 1.3 MSG/ 1.0 LPG |
| Hydrochloro-thiazide 25mg x30 | 0.7 MSG/ 0.3 LPG | 0.7 MSG/ 0.2 LPG |
| Nifedipine 20mg Retard x30 | 1.3 MSG/ 1.2 LPG | 1.3 MSG/ 1.2 LPG |
| Asthma | | |
| Salbutamol 100mcg/dose x1 inhaler (200 doses) | 0.5 OB, MSG & LPG | 0.5 OB, MSG & LPG |
| Beclometasone 250mcg/dose x1 inhaler (200 doses) | 1.7 MSG & LPG | 1.0 OB / 1.7 MSG & LPG |
| Budesonide 200mcg/dose x1 inhaler (200 doses) | - | 2.5 MSG & LPG |
| Arthritis | | |
| Diclofenac 50mg x60 | 5.3 OB / 0.2 MSG & LPG | 5.1 OB / 0.2 MSG & LPG |
| Peptic ulcer | | |
| Omeprazole 20mg x30 | 1.7 MSG/LPG | 1.8 MSG/LPG |
| Hypercholesterolaemia | | |
| Simvastatin 20mg x30 | 2.8 OB /1.4 MSG & LPG | 2.6 OB /1.4 MSG & LPG |
| Atorvastatin 20mg x30 | 8.5 OB /1.9 MSG /1.7 LPG | 8.1 OB /1.8 MSG /1.7 LPG |
| Schizophrenia | | |
| Clozapine 100mg x90 | 16.9 OB / 1.5 MSG / 1.4 LPG | - |
| Depression | | |
| Amitriptyline 25mg | 2.5 MSG/LPG | 2.7 MSG/2.6 LPG |
| Infection | | |
| Amoxicillin 500mg x21 | 0.5 MSG/LPG | 0.5 MSG/LPG |
| Amoxicillin 500mg + Clavulanic acid 125mg x14 | 1.3 OB /1.4 MSG/ 1 LPG | 1.3 OB /1.4 MSG/ 1 LPG |
| Amikacin inj 250mg x14 | 2.1 MSG & LPG | 2MSG / 2.1 LPG |
| Aciclovir 200mg x25 | 5 OB /1.1 MSG/0.4 LPG | 4.9 OB /1.1 MSG/0.5 LPG |

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

The affordability of medicines was similar in public and private pharmacies. For many treatments, patients on the minimum wage would require no more than 1 days' wages when buying lowest priced generics. However, medicines for a number of treatments were less affordable if originator brands were purchased e.g. about 5 days' wages are needed to buy 30 days' supply of the originator brand of diclofenac (for arthritis) but less than half a day's wages would be needed to buy generic versions.

For some medicines the most sold generic was less affordable than the lowest priced generic (such as amlodipine where the most sold generic required 1.8 days' wages whereas the lowest priced generic required 0.3 days' wages). Medicines to treat hypercholesterolaemia were less affordable, whether originator brands or

generics, at 1.4 to 8.5 days' wages depending on the medicine purchased.

Should this low paid worker need treatment for hypertension, diabetes and hypercholesterolaemia, then they would have to use 1.7 to 14.7 days wages every month to purchase medicines, depending upon the choice of medicine, product type, and where dispensed[v]. 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.

**Public sector availability**

The mean availability of the surveyed medicines in the public sector pharmacies was 29.5% for originator brands, 58.3% for most sold generics and 77.4% for lowest priced generics – see Table 3. The mean availability was 80.6% for any product type[vi].

Table 3. Availability in public sector pharmacies

| | Originator brand | Most sold generic | Lowest priced generic |
|---|---|---|---|
| Mean availability | 29.5% | 58.3% | 77.4% |
| Standard deviation | 28.6% | 25.3% | 24.6% |

Tables 4 and 5 list the availability of originator brands and generics in public sector pharmacies. While salbutamol inhaler had good availability, beclometasone and budesonide inhalers for asthma prevention had poor availability in the public sector despite being on Ukraine's essential medicines list. Clozapine was another essential medicine with poor availability.

Table 4. Availability of originator brands, public pharmacies

| Availability | Medicine |
|---|---|
| 0 % | Atenolol, beclometasone inhaler, co-trimoxazole, isosorbide dinitrate, nifedipine, omeprazole |
| 1-20% | Atorvastatin, budesonide inhaler, carbamazepine, ceftriaxone inj, ciprofloxacin, clarithromycin susp, doxycycline, gliclazide, imipenem+cilastatin inj, losartan, meropenem inj, ondansetron inj |
| 21 -40% | Aciclovir, amlodipine, clarithromycin, clozapine, co-trimoxazole susp, enalapril, fluconazole, metronidazole, simvastatin, verapamil |
| 41 – 60% | Diclofenac, metformin |
| 61-80% | Acetylsalicyclic acid, diclofenac inj, loratadine, paracetamol susp, salbutamol inhaler |
| 81-100% | Amoxicillin+clavulanic acid, ibuprofen susp & tab |

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Table 5. Availability of generics, public pharmacies

| Availability | Medicine |
|---|---|
| 0 % | - |
| 1-20% | **B**udesonide inhaler, imipenem+cilastatin inj, meropenem inj |
| 21-40% | Clozapine |
| 41- 60% | Amikacin inj, amitriptyline, beclometasone inhaler, clarithromycin susp, co-trimoxazole susp, gliclazide |
| 61-80% | Amoxicillin+clavulanic acid, diazepam, ibuprofen, nifedipine, ofloxacin, ondansetron inj, paracetamol susp, simvastatin, verapamil |
| 81-99% | Acetylsalicyclic acid, aciclovir, amlodipine, amoxicillin, atenolol, atorvastatin, carbamazepine, ciprofloxacin, clarithromycin, co-trimoxazole, diclofenac inj & tab, doxycycline, enalapril, fluconazole, hydrochlorothiazide, ibuprofen susp, isosorbide dinitrate, losartan, metformin, metoclopramide, propranolol, salbutamol inhaler |
| 100% | Captopril, ceftriaxone inj, furosemide, glibenclamide, loratadine, omeprazole |

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**Public sector patient prices**

Across the 35 public sector pharmacies surveyed, prices were 13.80, 4.65 and 3.64 times the international reference price for originator brand medicines, most sold generics and lowest priced generics respectively (Table 6).

Table 6. Number of times more expensive: patient prices in the public sector compared to international reference prices

| | Originator brand | Most sold generic | Lowest priced generic |
|---|---|---|---|
| Median MPR *(interquartile range)* | 13.80 *(4.20-27.58)* | 4.65 *(2.83-8.43)* | 3.64 *(2.27-6.13)* |
| Minimum | 1.42 | 0.28 | 0.26 |
| Maximum | 181.75 | 34.35 | 13.36 |
| No. of medicines | 26 | 46 | 47 |

The median price of the originator brands found in the public sector were 13.8 times the international reference price. None were lower than the international reference price. Many were significantly higher prices, ranging up to 181 times the international reference price for fluconazole 150mg caps.

Most sold generic equivalents were 4.65 times the international reference price, with some medicines ranging from much lower than the international reference price (0.28 times - or 72% less - for isosorbide dinitrate 10mg tab to much higher (e.g. hydrochlorthiazide 25mg tabs were 34 times the international reference price).

Lowest priced generic equivalents were 3.64 times the international reference price. Isosorbide dinitrate and clozapine were lower than the international reference prices, while metronidazole 250mg tabs were 13 times higher.

Table 7 lists those medicines with the highest multiples of international reference prices where there could be opportunities for buying and selling at lower prices.

Table 7. Number of times more expensive: patient prices in the public sector compared to international reference prices

| | Originator brand | Most sold generic | Lowest priced generic |
|---|---|---|---|
| Fluconazole 150mg | 181.75 | 17.57 | 11.68 |
| Diclofenac 50mg | 106.06 | 4.63 | 4.66 |
| Acetyl salicyclic acid 100mg | 103.79 | 7.89 | 7.89 |
| Hydrochlorothiazide | - | 34.35 | 13.03 |

| | | | |
|---|---|---|---|
| 25mg | | | |
| Metronidazole 250mg | 29.44 | 13.45 | 13.36 |
| Diclofenac 75mg/5ml inj | 27.71 | 11.67 | 2.28 |
| Amlodipine 5mg | 23.95 | 10.29 | 1.79 |
| Metoclopramide 10mg | - | 27.85 | 9.21 |

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### *Price variation by medicine*

Price variation across public sector pharmacies was not great for the majority of medicines (this can be seen by looking at the gap between the 25th and 75th percentiles representing 50% of the findings; the wider the gap the wider the variation in price). The greatest variation was seen for lowest priced generics of nifedipine 20mg Retard (25th percentile 2.08; 75th percentile 11.09, MPR 9.68), ofloxacin (25th percentile 2.75, 75th percentile 13.42, MPR 12.64) and hydrochlorothiazide (25th percentile 11.76, 75th percentile 35.07, MPR 13.03). These may have been different products.

### *Price variation by product type*

Using matched medicines pairs (i.e. where the medicine was available as two product types) originator brands were on average 6 times the price of lowest priced generics, and 3.5 times higher than most sold generics (Table 8). This represents the brand premium, how much extra on average a patient would have to pay when purchasing the originator brand. Most sold generics were, on average, 1.3 times (30%) higher priced than the lowest priced generics.

Table 8. Ratio matched pairs of product types, public sector

| | Ratio |
|---|---|
| Originator brand: most sold generic (n=23 medicines) | 3.5 |
| Originator brand: lowest priced generic (n=24 medicines) | 6.0 |
| Most sold generic: lowest priced generic (n=46 medicines) | 1.3 |

**Private sector availability**

The mean availability of the surveyed medicines in private pharmacies was 37.3% for originator brands, 64.4% for most sold generics and 81% for lowest priced generics (Table 9). The mean availability was 83.3% for any product type[vii].

Table 9. Availability in private pharmacies

| | Originator brand | Most sold generic | Lowest priced generic |
|---|---|---|---|
| Mean availability | 37.3% | 64.4% | 81.0% |
| Standard deviation | 32.7% | 27.9% | 26.7% |

Tables 10 and 11 list the availability of originator brands and generics in the private pharmacies. Thirty-five (35) of the 50 surveyed medicines greater than 80% availability, of which 11 had 100% availability (generics). Diazepam was not found in any of the private pharmacies surveyed as none were licensed to dispense it.

Table 10. Availability of originator brands, private pharmacies

| Availability | Medicine |
|---|---|
| 0 % | Atenolol, ceftriaxone inj, ciprofloxacin, co-trimoxazole, isosorbide dinitrate, nifedipine, omeprazole |
| 1-20% | Beclometasone inhaler, budesonide inhaler, carbamazepine, clarithromycin susp, clozapine, doxycycline, gliclazide, imipenem+cilastatin inj, losartan, meropenem inj |
| 21-40% | Atorvastatin, clarithromycin, co-trimoxazole susp, ondansetron inj, simvastatin, verapamil |
| 41 – 60% | Aciclovir, amlodipine, enalapril, fluconazole, isosorbide dinitrate, |
| 61-80% | Diclofenac, metformin, paracetamol susp |
| 81-100% | Acetylsalicyclic acid, amoxicillin+clavulanic acid, diclofenac inj, ibuprofen susp & tab, loratadine, salbutamol inhaler |

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Table 11. Availability of generics, private pharmacies

| Availability | Medicine |
|---|---|
| 0 % | Diazepam |
| 1-20% | Amitriptyline, budesonide inhaler, clozapine, imipenem+cilastatin inj, meropenem in, |
| 21 -40% | - |
| 41 – 60% | Amikacin inj, beclometasone inhaler, |
| 61-80% | clarithromycin susp, gliclazide, ofloxacin, ondansetron inj, paracetamol susp, spironolactone, verapamil |
| 81-99% | Acetylsalicyclic acid, amlodipine, amoxicillin, amoxicillin+clavulanic acid, atenolol, atorvastatin, captopril, carbamazepine, ciprofloxacin, co-trimoxazole susp & tab, diclofenac, enalapril, fluconazole, hydrochlorothiazide, ibuprofen susp & tab, isosorbide dinitrate, metformin, nifedipine, metronidazole, propanolol, salbutamol inh, simvaststain |
| 100% | Aciclovir, ceftriaxone inj, clarithromycin, diclofenac inj, doxycycline, furosemide, glibenclamide, loratadine, losartan, metoclopramide, omeprazole |

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**Private sector patient prices**

Across the 35 private pharmacies surveyed, prices were 10.98, 4.22 and 2.97 times the international reference price for originator brand medicines, most sold generics and lowest priced generics respectively (Table 12).

Table 12. Number of times more expensive: patient prices in the private sector compared to international reference prices

| | Originator brand | Most sold generic | Lowest priced generic |
|---|---|---|---|
| Median MPR *(interquartile range)* | 10.98 *(3.27-27.17)* | 4.22 *(2.57-8.53)* | 2.97 *(2.05-5.21)* |
| Minimum | 1.41 | 0.24 | 0.23 |
| Maximum | 172.09 | 33.21 | 14.01 |
| No. of medicines | 27 | 45 | 47 |

The median price of the 27 originator brands found in the private sector was about 11 times the international reference price, with some medicines significantly higher

at over 100 times the international reference price (fluconazole, diclofenac, and acetylsalicyclic acid).

Overall most sold generic equivalents were 4.22 times the international reference price, with medicines ranging from much lower than the international reference price (0.24 times - or 76% less - for isosorbide dinitrate 10mg tab) to much higher (e.g. hydrochlorothiazide 25mg tabs were 33 times the international reference price).

Lowest priced generic equivalents were about 3 times the international reference price with two medicines lower than the international reference price (e.g. isosorbide dinitrate and meropenem inj.) and some much higher (e.g. fluconazole was 14 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. Number of times more expensive: patient prices in the private sector compared to international reference prices

| | Originator brand | Most sold generic | Lowest priced generic |
|---|---|---|---|
| Fluconazole 150mg | 172.09 | 17.44 | 14.01 |
| Acetylsalicyclic acid 100mg | 103.08 | 7.58 | 7.58 |
| Diclofenac 50mg | 102.50 | 4.27 | 4.27 |
| Metronidazole 250mg | 27.64 | 13.03 | 13.20 |
| Amlodipine 5mg | 24.05 | 9.51 | 1.78 |
| Hydrochlorothiazide 25mg | | 33.21 | 11.67 |
| Metoclopramide 10mg | | 27.16 | 9.06 |
| Co-trimoxazole 480mg tab | | 9.45 | 9.10 |

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### *Price variation by medicine*

In the private sector price variation between the 25$^{th}$ and 75$^{th}$ percentiles for individual medicines was generally less than in the public sector. As shown in Table 14, the greatest variation was seen for generic budesonide inhaler where the 25$^{th}$ and 75$^{th}$ percentiles ranged from 0.46 to 2.10 (although all were acceptable levels for this sector).

Table 14. Price variation in the private sector for some lowest priced and most sold generics (patient prices compared to international reference prices)

| Medicine and product type | Median | 25$^{th}$ percentile | 75$^{th}$ percentile |
|---|---|---|---|
| Budesonide 200mcg/dose inhaler – MSG/LPG | 1.24 | 0.46 | 2.10 |
| Hydrochlorothiazide - LPH | 11.67 | 10.83 | 32.15 |
| Amikacin inj - LPG | 2.42 | 2.24 | 6.19 |
| Spironolactone 25mg - LPG | 2.10 | 1.92 | 4.74 |
| Ofloxacin 400mg - LPG | 11.22 | 6.39 | 12.43 |

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### *Price variation by product type*

Using matched medicines pairs, originator brands were on average 3.8 times (280%) the price of lowest-priced generics (Table 15). Most sold generics were on average 1.4 times (40%) higher priced than lowest priced generics.

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

| | Ratio |
|---|---|
| Originator brand: most sold generic (n=25 medicines) | 2.6 |
| Originator brand: lowest priced generic (n=27 medicines) | 3.8 |
| Most sold generic: lowest priced generic (n=45 medicines) | 1.4 |

### Comparison of patient prices in the public and private sectors

The patient price of originator brands in the private sector was on average 6.2% higher than in the public sector. While there was no difference in the prices of lowest priced generics, and most sold generics in the private sector were 7.9% lower priced than in the public sector (Table 18).

Table 18. Percentage difference private sector patient prices to public sector patient prices for matched pairs of medicines

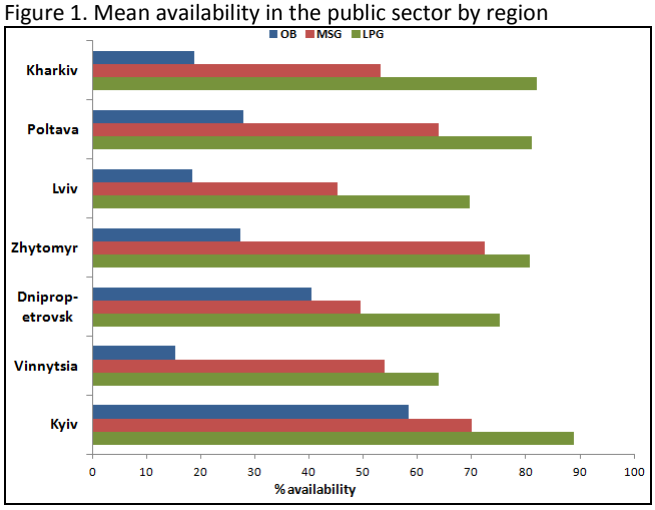
| | Difference |
|---|---|
| Originator brands (n=23 medicines) | 6.2% |
| Most sold generics (n=43 medicines) | -7.9% |
| Lowest priced generics (n=44 medicines) | -0.3% |

### Cross region comparison of availability

### *Public sector*

The mean availability of the surveyed medicines in the public sector was highest in Kyiv for lowest priced generics (89%) and originator brands (58%) as shown in Figure 1. The availability was lowest in Vinnytsia at 64% for lowest priced generics and 15% for originator brands.

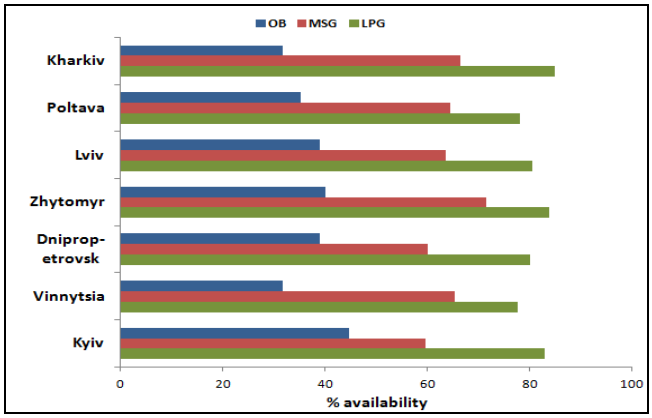
Figure 1. Mean availability in the public sector by region




### *Private sector*

In private pharmacies, the mean availability of the surveyed medicines was very similar across the 7 regions for lowest priced generics (Figure 2). Originator brands varied in availability from about 32% in Kharkiv to 45% in Kyiv.

Figure 2. Mean availability in the private sector by region

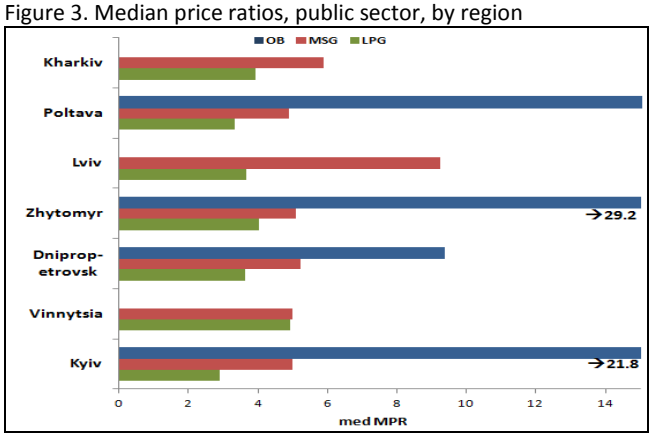



**Cross region comparison of patient prices**

### *Public sector*

As shown in Figure 3, overall lowest priced generics were lowest priced in Kyiv (medMPR 2.89) and highest priced in Vinnytsia (medMPR 4.94). Originator brands were highest priced in Zhytomyr and Kyiv at over 20 times international reference prices although the data for Zhytomyr is based on only 6 medicines.

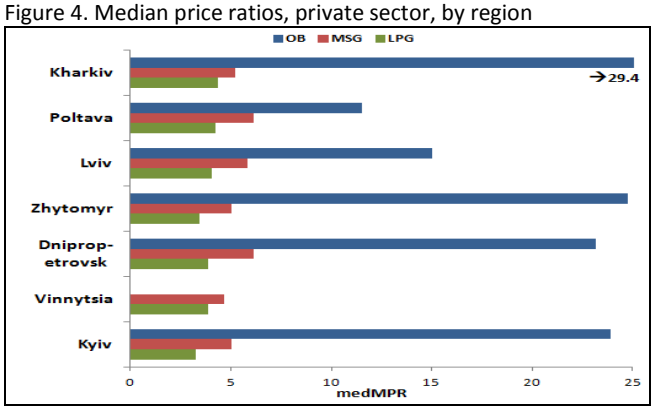
Figure 3. Median price ratios, public sector, by region




### *Private sector*

Overall, private sector patient prices were highest for originator brands in Kharkiv, Zhytomyr, Dnipropetrovsk and Kyiv (Figure 4). Prices of lowest priced generics were similar across the 7 regions.

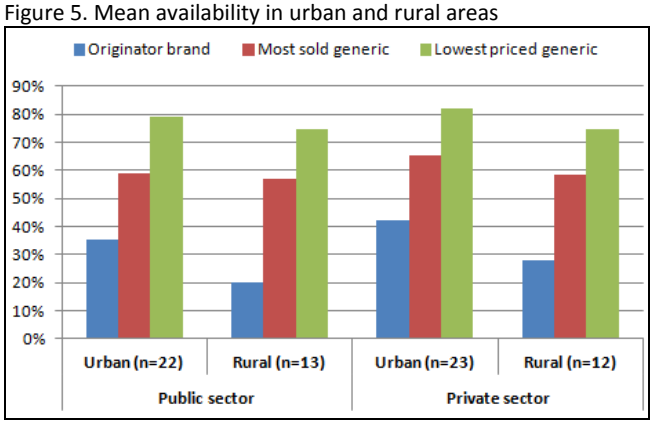
Figure 4. Median price ratios, private sector, by region




**Availability in urban and rural areas**

In both the public and private sectors, mean availability for lowest priced generics was slightly higher in urban areas compared to rural areas (75% to 82% as shown in Figure 5). The availability of originator brands was lower in rural areas than urban areas in both sectors.

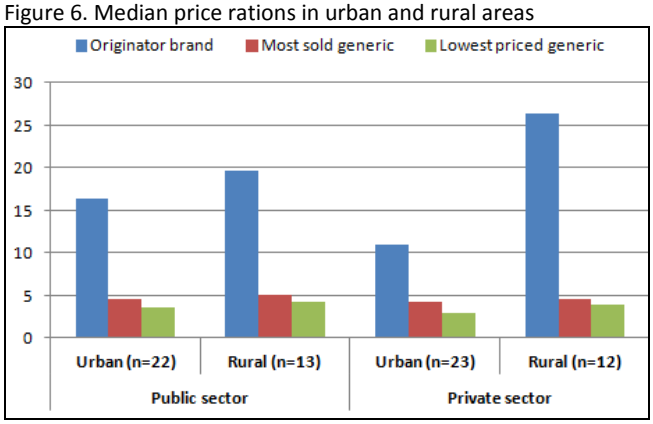
Figure 5. Mean availability in urban and rural areas




**Patient prices in urban and rural areas**

In the public and private sectors, overall patient prices for originator brands were higher priced in rural areas that in urban areas (Figure 6). In the private sector, prices in rural areas were over twice those in urban areas. For most sold generics there was little price variation between urban and rural areas in both sectors. For lowest priced generics, prices in rural areas were 15% higher than urban areas in the public sector and 33% higher in the private sector.

Figure 6. Median price rations in urban and rural areas




**Medicine price components**

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 (official policies) and in the field for 3 medicines in the private sector (wholesale and retail mark-ups from major retailers and distributors). Determining all mark-ups and charges in the distribution chain, in the public and private sectors, proved difficult. VAT is not applied to medicines.

### *Official mark-ups*

For essential medicines, the maximum permitted wholesale mark-up is 12% in public sector pharmacies and

private retail pharmacies. Retail mark-ups are regressive, with the following maximum levels:

| Price of medicine UAH | Max. Retail mark-up |
|---|---|
| ≤ 100 UAH | 25 % |
| 100-300 UAH | 23 % |
| 300-500 UAH | 20 % |
| 500-1000 UAH | 15 % |
| >1000 UAH | 10 % |

For other medicines the maximum wholesale mark-up is 10% and there is no limit on retail mark-ups.

### *Observed mark-ups*

As shown in Table 19, wholesale markups did not exceed 10% and retail mark-ups did not exceed 25% (i.e. neither exceeded permitted levels). Some wholesalers were selling these medicines at less than the procurement price; whether their profits were due to discounts and/or rebates on the procurement price could not be ascertained.

Table 19. Observed public and private sector mark-ups

| **Medicine** | **EML** | **Median retail price (UAH) for 30 tab private sector** | **Whole-sale m/up** | **Retail m/up** |
|---|---|---|---|---|
| Amlodipine 5mg tab | Yes | 177 OB<br>70 MSG<br>13 LPG | -0.3% to 10.0% | 17.8% to 22.1% |
| Enalapril 10mg tab | Yes | 79 OB<br>8 MSG & LPG | -13.3% to 10.0% | 13.1% to 24.5% |
| Nifedipine 20mg Retard | Yes | 54 MSG<br>52 LPG | - 9.0% | 14.4%. |

Prices in the official List of Manufacturers' Prices include a maximum wholesale mark-up of 10% + a maximum retail mark-up of 10%. These relate only to government procurements (not the retail sector).

### Comparison with 2007 survey findings

In 2007 a medicine price and availability survey was undertaken in Ukraine using the WHO/HAI methodology[viii]. Twenty medicines were common to both the 2007 survey and to this 2012 survey. After adjusting for inflation, patient prices in the public and private sectors were compared. As shown in Table 20, there was little data for originator brands. Overall prices of lowest-priced generics increased in the public sector by 12%, but only by 1% in the private sector. However, there were some large price changes. In the public sector, amitriptyline (LPG) and hydrochlorothiazide (LPG) more than doubled in price, as did Nifedipine Retard (LPG) in the private sector. In the public sector, prices more than halved for aciclovir (LPG) and fluconazole (LPG). Prices more than halved in the private sector for losartan (OB) and simvastatin (LPG).

Table 20. Price changes 2007 to 2012.

| *Sector* | *Product type* | *No. of meds in analysis* | *Median price increases 2007 - 2012* |
|---|---|---|---|
| Public | OB | 5 | 3% increase |
| | LPG | 17 | 12% increase |
| Private | OB | 8 | no change |
| | LPG | 18 | 1% increase |

### International price comparisons

Patients prices in the private sector in Ukraine were compared with 2011 prices in 8 other countries[ix]. For lowest priced generics, overall prices in Ukraine were similar to Bulgaria, but lower than in Germany, Hungary, Italy, Lithuania, Moldova, Romania and Tatarstan Province in Russia (Table 21). Figure 7 shows the prices across these countries for 3 medicines.

Table 21. Overall private sector patient prices, lowest priced generics, in Ukraine compared to other countries

| *Country and year of data* | *No. of meds in analysis* | *Ukraine prices compared to comparator prices* |
|---|---|---|
| Bulgaria (2011) | 11 | 3% lower |
| Germany (2011) | 12 | 92% lower |
| Hungary (2011) | 11 | 59% lower |
| Italy (2011) | 9 | 85% lower |
| Lithuania (2011) | 10 | 72% lower |
| Moldova (Sept 2011) | 12 | 51% lower |
| Romania (2011) | 11 | 54% lower |
| Russia, Tatarstan Prov. (Feb 2011) | 10 | 28% lower |

There was insufficient data to compare baskets of originator brand prices. However, as shown in Figure 8, private sector patient prices for a few individual originator brand products could be compared internationally. While the price of salbutamol inhaler (Ventolin®) was lower in Ukraine than the other seven countries, the price of fluconazole (Diflucan®) was higher than the comparators. The price of amlodipine (Norvasc®) was higher in Ukraine than all the other countries except Germany.

Figure 7. Patient prices for 1 tab/cap (euro), private sector, lowest priced generics

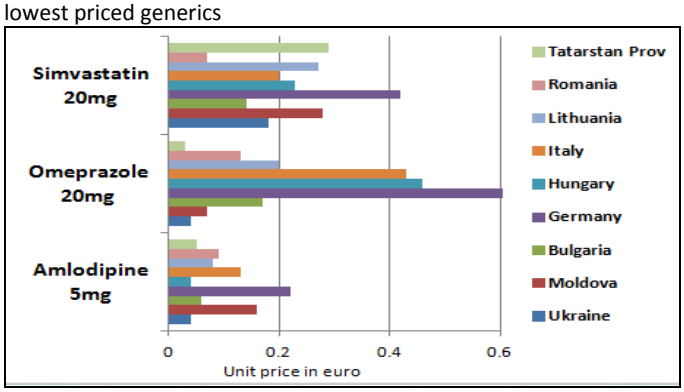
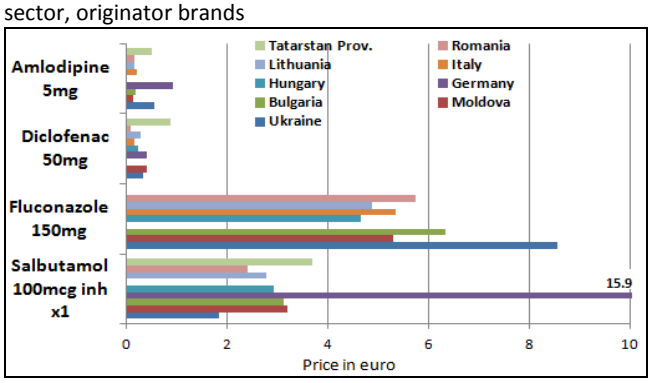



Figure 8. Patient prices for 1 tab/cap/inhaler (euro), private sector, originator brands



**Recommendations of the investigators**

The results of this analysis show that a combination of policies should be implemented to make medicines more available and more affordable, as well as further research to better understand the causes of high prices and poor availability of some medicines. The following is recommended:

• conducting an in-depth study of price components for essential medicines;
• determining the causes of regional differences in the availability and prices of originator brands and generics, and include additional regions in the study;
• strengthening generics policies including permitting generic substitution by pharmacists for all medicines, publishing the results of bioequivalence studies, and educating physicians, pharmacists and the public about the economic benefits of using quality-assured generic medicines;
• establishing a system to regularly monitor the price and availability of essential medicines in public and private sectors;
• improving transparency by publishing the prices paid by the government on a website that is publicly accessible;
• supporting the gathering and exchange of price and availability information from countries in the region (European Union and CIS).

**Contributors**

*Survey coordinator:*
Tetyana Dumenko, Director, Department of Rational Pharmacotherapy and State Formulary System Support, State Expert Center MoH, Kyiv.
*Area supervisors*:
Lviv region – Andriy Zimenkovskyi, Consultant, State Expert Center MoH and Chair, Department of Clinical Pharmacy, Pharmacotherapy and Medical standards, Lviv National Medical University.
Vinnitsa, Zhytomyr, Poltava regions - Valentyn Pariy, Consultant, State Expert Center MoH and Chair, Department of Health Management, AA Bogomolets National Medical University.
Dnipropetrovsk and Kharkov regions - Larysa Yakovleva, Consultant, State Expert Center MoH and Chair, Department of Pharmacoeconomics, National Pharmaceutical University (Kharkiv).
*Data entry:*
Olga Sadovnycha and Nataliia Kytsiuk, Deputy Heads, Department of Rational Pharmacotherapy and State Formulary System Support, State Expert Center MoH, Kyiv.

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**Further information**

Contact:
Tetyana Dumenko,
State Expert Centre of the Ministry of Health
40 Ushynskogo Str., Of. 711, 03151
Kyiv, Ukraine.
Phone / fax (+380 44) 393 7589.
Email dumenko@dec.gov.ua

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] Reflecting the global burden of disease, WHO/HAI Measuring medicine prices, availability, affordability and price components, 2008
[iii] http://erc.msh.org
[iv] 1 USD = 7.9867 Hryvnia
[v] One antihypertensive (atenolol, amlodpine, captoprl, enalapril, losartan, hydrochlorothiazide or nifedipinel) one anti-diabetic (glibenclamide or gliclazide) and one antihypercloesterolaemia (simvastatin or atorvastatin)
[vi] Not counting availability twice when both originator and generic equivalents were found in the same pharmacy
[vii] Not counting availability twice when both originator and generic equivalents were found in the same pharmacy
[viii] See summary report on http://www.haiweb.org/medicineprices/surveys.php
[ix] Data unadjusted for CPI and PPP. Data for Bulgaria, Germany, Hungary, Italy, Lithuania and Romania obtained from OBIG. Moldova and Tatarstan data accessed from http://www.haiweb.org/MedPriceDatabase/