

# Thailand

## Medicine prices, availability, affordability & price components

### Medicine prices matter

Rapidly rising costs of health care and high medicine prices are a growing concern worldwide, especially in developing countries where patients often have to pay the full price of medicines. This brief report about medicine prices and availability in Thailand 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<sup>1</sup>.

This survey was conducted in 2006 by the Faculty of Pharmacy, Mahidol University and the Office of the Food and Drug Administration, Ministry of Public Health. It uses a group of 26 medicines, with pre-set dosage forms, strengths and recommended pack sizes that are relevant to the global burden of disease, plus 17 selected medicines of national importance.

#### This survey found that in Thailand:

- Generic medicines were more available in the public sector than originator brands however some hospitals stocked both versions of some medicines. In the private sector the availability of both originator brands and generics was poor.
- Public sector patient prices were high compared to international reference prices. Patients paid 32% and 75% more than procurement prices for originator brands and generics respectively.
- In the private sector, patients paid very high prices for some medicines, particularly originator brands. Overall they were 3.9 times more expensive than lowest priced generics.
- Most treatments for acute and chronic conditions required less than 1 day's wages if lowest priced generics were used and up to 5 days if originator brands were used. However, a month's HIV treatment required up to 24 days' wages.
- Public sector mark-ups ranged from 28-41% for originator brands and 20 - 317% for generic equivalents. In the private sector, wholesaler mark-ups ranged from 7-31% for generics and 0-2% for originator brands. Pharmacy mark-ups (including tax) were 13-40% for originator brands and 20-150% for generics.

### Thailand

The Kingdom of Thailand is situated in the continental Southeast Asia, just north of the equator, and is part of the Indochina Peninsula. The population of Thailand is 64 million (2008).

The major causes of death among Thai citizens are non-communicable diseases (notably diseases of the circulatory system and cancer), and accidents.

Thailand has had a National Drugs Policy since 1981 which was revised in 1993. The Drug Act was revised in 1987 and 2003.

About 56% of medicines are imported; 46% are locally produced. The new Drug Act requires all manufacturers to have GMP certification. Assurance of bioequivalence is required for the registration of generics (in addition to quality assurance). New chemical entities are initially only approved for use in hospitals (2 years) to allow safety monitoring. The Ministry of Public Health regularly tests medicines once marketed.

The Pharmacy and Therapeutic Committee of each public hospital selects medicines for their institution; some medicines are procured through a group purchasing programme. Patients tend to buy prescribed medicines at hospital pharmacies rather than community pharmacies or drug stores.

Three major health insurance schemes operate in Thailand: Civil Servant Medical Benefit Scheme, Social Health Security System, and Universal Coverage System.

### Medicine price & availability survey

The survey was designed to answer the following questions:

- Is the public sector purchasing medicines efficiently compared to international reference prices?
- What is the availability and price of originator brand and generic equivalent medicines in the public and private sectors, and how do the prices compare with international reference prices?
- How do the prices of originator brands and generic equivalents vary?
- How affordable are medicines for treating common conditions for people on a low income?
- What charges get added to the price of medicines in the distribution chain from manufacturer to patient?
- How do prices in Thailand compare to those in other countries?

<sup>1</sup> WHO/HAI. Medicine prices: a new approach to measurement, Geneva, World Health Organization, 2003. <http://www.haiweb.org/medicineprices>

A total of 43 medicines were surveyed in October - December 2006, 26 from the WHO/HAI core list and 17 supplementary medicines. Prices and availability were recorded for the originator brand product (OB), most sold generic equivalent (MSG)<sup>2</sup>, and the lowest priced generic equivalent (LPG) which was determined at each facility. Two prices were recorded: the procurement price paid by outlets in the public and private sectors, and the price they charged to patients.

Price and availability data was collected from a total of 20 public hospitals and 21 private retail pharmacies in the capital city, Bangkok, and three randomly selected districts in each part of Thailand: Phitsanulok (North), Suratthani (South), and Nakornratchasema (Northeast). The data on public procurement prices were collected at the public hospitals (and checked at the Provincial Health Offices).

International reference prices were not available for all medicines. Therefore, summary price data is based on 35 medicines. Availability was based on all 43 medicines surveyed.

Price components were analysed for 3 medicines (9 products) in both sectors.

**Table 1.** Measurements in each sector.

Measurement	Public sector	Private sector
Price to patient	✓	✓
Availability	✓	✓
Affordability	✓	✓
Procurement price	✓	✓
No. of facilities visited	20	21

### Presentation of price information

The WHO/HAI survey methodology presents prices as median price ratios (MPR). The MPR is calculated by dividing the local price by an international reference price (converted to local currency). 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 2005 Management Sciences for Health (MSH) International Medicine Price Indicator Guide<sup>3</sup> (the MSH Guide pulls together information from recent price lists of large, generic medicine suppliers and thus reflects the prices governments could be expected to pay for medicines); use of reference prices facilitates international comparisons.

### 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 and public sector patient prices are considered to indicate acceptable (not excessive) prices.

### Affordability

Affordability is calculated as the number of days the lowest paid unskilled government worker would have to work to pay for one treatment course for an acute condition or one month's treatment for a chronic condition. At the time of the survey, the lowest paid government worker earned 211.5 Baht (US\$ 5.60) per day.

Having to spend more than 1 day's income per month on family medicine needs is considered by some as unaffordable. Table 2 demonstrates how many days this worker would have to work to purchase various treatments.

Overall, a low paid unskilled government worker would generally need 0.1 – 3.3 days wages for generics for the treatment of acute diseases such as acute respiratory infection; and 0.2 - 5 days for originator brands – depending upon condition; medicine choice and where purchased from.

Treatment cost of chronic conditions ranged between 0.1 – 3.3 days when using lowest priced generics; or 0.3 – 5.5 days' wages if purchasing originator brand products – depending upon condition, medicine choice, and where purchased from. Medicines to treat HIV/AIDS required between 4 - 24 days' wages when purchased in the public sector.

Should this low paid worker need treatment for hypertension, arthritis and a peptic ulcer, then they would have to use 0.4 - 12 days of salary every month to purchase a months supply of the medicines<sup>4</sup> – depending upon the choices of medicine, where it was obtained, and whether brand or generic was dispensed. As the person and family members often have a number of conditions requiring treatment, even purchasing lowest priced generics requires a significant proportion of income to be spent.

<sup>2</sup> The price and availability of a centrally determined most sold generic was measured, however this aspect of the methodology is no longer recommended – and is not reported in this summary report.

<sup>3</sup> <http://erc.msh.org>

<sup>4</sup> One antihypertensive (amlodipine, atenolol, captopril, enalapril, hydrochlorothiazide, losartan or nifedipine retard); diclofenac for arthritis, and one ulcer healing drug (omeprazole or ranitidine)

**Table 2.** Affordability: number of days' wages.

Hypertension		Public	Private
amlodipine	OB		3.5
	LPG	0.4	0.9
atenolol	OB		1.3
	LPG	0.1	0.3
captopril	OB	3.0	
	LPG	0.9	
enalapril	OB		2.4
	LPG	0.2	0.4
hydrochlorothiazide	OB		0.3
	LPG	0.1	0.1
losartan	OB	3.9	4.8
nifedipine retard	LPG	0.8	1.3
Asthma			
salbutamol inhaler	OB	0.8	0.9
Ulcer			
omeprazole	LPG	0.2	0.7
ranitidine	OB		5.5
	LPG	0.3	0.5
Diabetes			
glibenclamide	OB		0.9
	LPG	0.3	0.3
metformin	OB		1.1
	LPG	0.6	0.4
Depression			
amitriptyline	LPG	0.3	0.4
fluoxetine	LPG	0.2	0.4
Arthritis			
diclofenac	OB		1.7
	LPG	0.1	0.3
Respiratory tract infection			
adult amoxicillin 250mg (7 days)	OB		0.6
	LPG	0.1	0.2
adult azithromycin (7 days)	OB	4.8	5.3
	LPG	2.2	3.3
adult ceftriaxone inj.	LPG	1.0	2.0
child cotrimoxazole susp (7 days)	OB		0.2
	LPG	0.1	0.1

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### Public sector procurement prices

Both originator brands and generics were procured; and in some cases the same medicine was procured in originator and generic equivalent versions.

Procurement prices for the 8 originator brands were 3.3 times (230% more than) the international reference price with 50% of the medicines in the range of 1.65 – 7.68 times; which ranged

from 0.96 times (4% less) for losartan to 12.10 times for captopril. Procurement prices for the 31 lowest priced generic equivalents were 1.46 times (46% more) the international reference price with 50% of the medicines in the range of 0.8 – 2.26 times: which ranged from 0.3 times for amlodipine to 3.07 times for azithromycin (Table 3).

**Table 3.** Number of times more expensive: public sector procurement prices compared to international reference prices.

	Most sold generic	Lowest priced generic
Median MPR (interquartile range)	3.3 (1.6 – 7.8)	1.46 (0.8 – 2.3)
Minimum	0.96	0.3
Maximum	12.1	3.07
No. of medicines	8	31

Table 4 presents 9 medicines where procurement prices were high for originator brands and generics – and where there is a large price differences between the originator and generic equivalents. For example originator and generic captopril were 12 and almost 3 times the international reference price respectively – and originator brand phenytoin was 4.6 times (360% more) the price of the generic equivalent.

**Table 4.** Number of times more expensive: public sector procurement prices compared to international reference prices.

	OB	LPG	Ratio OB: LPG
azithromycin	6.54	3.07	2.1
captopril	12.10	2.88	4.2
carbamazepine	4.67	1.83	2.5
ciprofloxacin		2.48	
erythropoietin alpha inj	1.40	0.67	2.1
glibenclamide		2.44	
nifedipine retard		2.60	
phenytoin	11.08	2.40	4.6
salbutamol inhaler	1.94		

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Across the 5 medicines found in the public sector in both originator and generic forms originator brands were 2.7 times the prices of the lowest priced generics.

## Public sector patient prices

Both originator brands and generics were available; and in some cases the same medicine was procured in originator and generic equivalent versions.

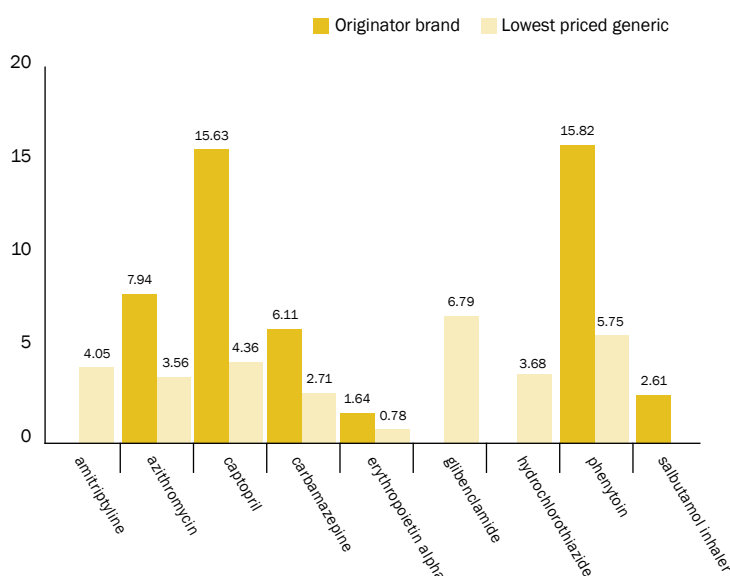
Patient prices for the 8 originator brands 4.36 times (336% more) the international reference price with 50% of the medicines in the range of 2 – 9.9 times: which ranged from 1.2 times (20% more) for losartan to 15.82 times for phenytoin. Patient prices for the 31 lowest priced generic equivalents were 2.55 times (155% more) the international reference price with 50% of the medicines in the range of 1.4 – 3.3 times: which ranged from 0.49 times for amlodipine to 6.79 times for glibenclamide (Table 5).

**Table 5.** Number of times more expensive: public sector patient prices compared to international reference prices.

	Originator brand	Lowest priced generic
Median MPR (interquartile range)	4.36 (2 - 9.9)	2.55 (1.4 - 3.3)
Minimum	1.2	0.49
Maximum	15.82	6.79
No. of medicines	8	31

Figure 1 and table 6 presents 9 medicines where patient prices were high for originator brands and generics – as well as those where there is a large price differences between the originator and generic equivalents. For example originator brand and generic phenytoin were almost 16 and 6 times the international reference price respectively – and originator brand captopril was 3.6 times (260% more) the price of the generic equivalent.

**Figure 1.** Number of times more expensive: patient prices in the public sector compared to international reference prices.



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

	OB	LPG	Ratio OB: LPG
amitriptyline		4.05	
azithromycin	7.94	3.56	2.2
captopril	15.63	4.36	3.6
carbamazepine	6.11	2.71	2.3
erythropoietin alpha inj	1.64	0.78	2.1
glibenclamide		6.79	
hydrochlorothiazide		3.68	
phenytoin	15.82	5.75	2.8
salbutamol inhaler	2.61		

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For many medicines, prices did not vary widely between outlets, however for some medicines the variation was much wider – table 7 demonstrates that co-trimoxazole suspension has a much narrower price variation – demonstrated by a small difference between the 25th and 75th percentiles; compared to aciclovir, amlodipine, ciprofloxacin, hydrochlorothiazide and phenytoin where the price variation is much wider.

**Table 7.** Number of times more expensive: public sector patient prices compared to international reference prices – lowest priced generic.

	Median	25%ile	75%ile	Min	Max
aciclovir	2.09	1.38	3.38	0.95	6.75
amlodipine	0.49	0.34	0.71	0.26	1.06
ciprofloxacin	3.48	1.74	3.68	1.74	7.21
co-trimoxazole susp.	1.43	1.37	1.52	1.07	1.79
hydrochlorothiazide	3.68	2.43	7.35	1.84	7.35
phenytoin	5.75	3.96	6.11	2.88	15.82

Across the 5 medicines found in the public sector in both originator and generic forms, originator brands were 2.2 times the prices of the lowest priced generics.

## Public sector availability

The median availability of lowest priced generics was higher at 75% than for originator brands at 10% (Table 8).

**Table 8.** Availability in the public sector.

	Originator brand	Lowest priced generic
Median availability (interquartile range)	10% (2.5 - 20%)	75% (27.5 - 95%)

Table 9 presents the availability of the surveyed medicines in the public sector. Beclometasone inhaler had low availability: 15% for originator brand and 10% for the generic equivalent. Medicines used to treat HIV/AIDS had poor availability in the public sector (except lamivudine)

**Table 9.** Availability of generics in the public sector.

Availability	Medicine
Not found	none
1-24%	artesunate, atorvastatin (OB), beclometasone inhaler, losartan (OB)
25-49%	amoxicillin + clavulanic acid, azithromycin, captopril, ciprofloxacin, clopidogrel (OB), erythropoietin alpha inj, indinavir (OB), levodopa + benserazide, mupirocin (OB), nifedipine retard
50-79%	budesonide aqueous nasal spray (OB), cetirizine, co-trimoxazole susp, hydrochlorothiazide, nevirapine, phenytoin, quinine sulfate, zidovudine
80% & over	aciclovir, amitriptyline, amlodipine, amoxicillin, atenolol, carbamazepine, ceftriaxone inj, diazepam, diclofenac, enalapril, fluconazole, fluoxetine, fluphenazine inj, glibenclamide, lamivudine, metformin, omeprazole, ranitidine, rifampicin, salbutamol inhaler (OB), simvastatin

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### Private sector patient prices

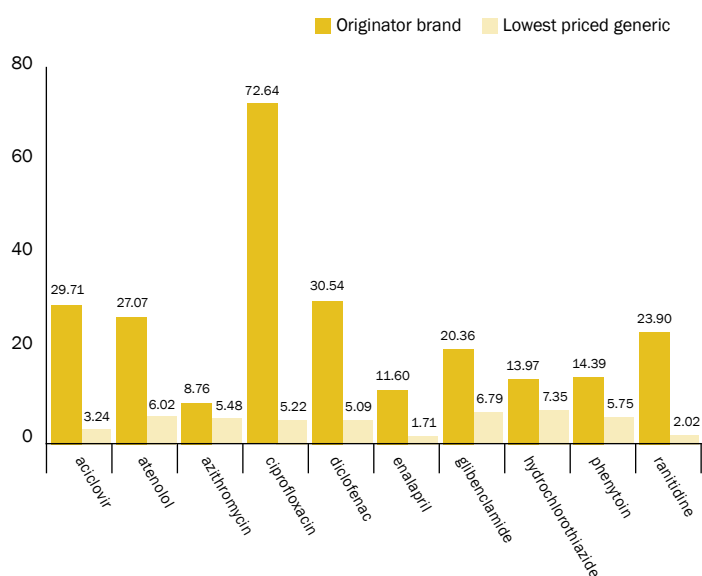
Patient prices for the 17 originator brands were 11.6 times (1,060% more) the international reference price with 50% of the medicines in the range of 5.4 – 23.9 times: which ranged from 1.48 times (48% more) for losartan to 72.64 times for ciprofloxacin. Patient prices for the 22 lowest priced generic equivalents were 3.31 times (231% more) the international reference price with 50% of the medicines in the range of 2.3 – 5.5 times: which ranged from 1.15 times (15% more) for amlodipine to 7.35 times for hydrochlorothiazide (Table 10).

**Table 10.** Number of times more expensive: patient prices in the private sector compared to international reference prices.

	Originator brand	Lowest priced generic
Median MPR (interquartile range)	11.6 (5.4 – 23.9)	3.31 (2.3 – 5.5)
Minimum	1.48	1.15
Maximum	72.64	7.35
No. of medicines	17	22

Figure 2 and table 11 presents 10 medicines where patient prices were high for originator brands and generics – as well as those where there is a large price differences between the originator and generic equivalents. For example originator brand and generic phenytoin were almost 16 and 6 times the international reference price respectively – and originator brand captopril was 3.6 times (260% more) the price of the generic equivalent.

**Figure 2.** Number of times more expensive: patient prices in the private sector compared to international reference prices.



**Table 11.** Number of times more expensive: private sector patient prices compared to international reference prices.

	OB	LPG	Ratio OB: LPG
aciclovir	29.71	3.24	9.2
atenolol	27.07	6.02	4.5
azithromycin	8.76	5.48	1.6
ciprofloxacin	72.64	5.22	13.9
diclofenac	30.54	5.09	6.0
enalapril	11.60	1.71	6.8
glibenclamide	20.36	6.79	3.0
hydrochlorothiazide	13.97	7.35	1.9
phenytoin	14.39	5.75	2.5
ranitidine	23.90	2.02	11.8

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For many medicines, prices did not vary widely between pharmacies, however for some medicines the variation was much wider – table 12 demonstrates that nifedipine retard has a much narrower price variation – demonstrated by a small difference between the 25th and 75th percentiles – compared to amitriptyline, carbamazepine, fluoxetine, and hydrochlorothiazide where the price variation is much wider.

**Table 12.** Number of times more expensive: private sector patient prices compared to international reference prices – lowest priced generic.

	Median	25%ile	75%ile	Min	Max
amitriptyline	5.40	5.40	10.80	2.70	16.21
carbamazepine	3.05	2.21	3.90	1.36	5.43
fluoxetine	3.37	3.06	5.51	1.84	7.97
hydrochlorothiazide	7.35	3.68	7.35	2.21	14.71
nifedipine retard	6.16	5.54	6.16	4.92	6.77

Across the 15 medicines found in the public sector in both originator and generic forms originator brands were 3.9 times the prices of the lowest priced generics.

### Private sector availability

As shown in Table 13, the median availability of the 43 medicines surveyed by 28.6% for both originator brand and generic equivalent versions.

**Table 13.** Availability in the private sector.

	Originator brand	Lowest priced generic
Median MPR (interquartile range)	28.6% (4.8 - 71.4%)	28.6% (0 - 92.9%)

Table 14 presents the availability of the surveyed medicines in the private sector. Beclometasone inhaler had low availability (<5% originator brand and no generics) and no generic versions of salbutamol inhaler were found in the pharmacies surveyed. Many other medicines used to treat acute and chronic diseases had poor availability.

**Table 14.** Availability of generics in private pharmacies.

Availability	Medicine
Not found	artesunate, erythropoietin alpha inj, fluphenazine inj, indinavir, lamivudine, nevirapine, zidovudine
1 - 24%	beclometasone inhaler (OB), captopril (OB), diazepam, quinine sulfate, rifampicin
25-49%	amoxicillin + clavulanic acid (OB), ceftriaxone inj, co-trimoxazole susp, levodopa + benserazide (OB)
50 - 79%	carbamazepine (OB), clopidrogel (OB), fluconazole, fluoxetine, hydrochlorothiazide, losartan (OB), mupirocin (OB), nifedipine retard, phenytoin (OB)
80% & over	aciclovir, amitriptyline, amlodipine, amoxicillin, atenolol, atorvastatin (OB), azithromycin (OB) budesonide aqueous nasal spray (OB), cetirizine, ciprofloxacin, diclofenac, enalapril, glibenclamide, metformin, omeprazole, ranitidine, salbutamol inhaler (OB), simvastatin

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### Inter-sectoral comparison

Overall public sector patient prices were 32% and 74.7% higher than the public sector procurement prices for the 8 common originator brands and 31 common generic equivalents respectively.

Overall patient prices for the 22 common generic medicines in the private sector were 36.6% higher than in the public sector. Prices of the 5 common originator brands were 43.4% higher in the private sector.

### Price components

In the public sector, cumulative mark-ups ranged from 20% to over 2000%. However, the data was based on the manufacturers selling price reported to the Thai FDA which may be inaccurate. Public sector facility mark-ups ranged from 28-41% for originator brands and 20 - 317% for generic equivalents.

In the private sector, cumulative mark-ups ranged from 37% to 900%. Again, the data was based on the manufacturers selling price reported to the Thai FDA which may be inaccurate. Wholesaler mark-ups ranged from 7-31% for generic equivalents and 0-2% for originator brands. Pharmacy mark-ups (including tax) were 13-40% for originator brands and 20-150% for generics.

## Conclusions and proposals of the investigators

1. The prices of some originator brands were very high despite the availability of generic equivalent products.  
*Suggestion: Price regulations should be applied to originator brands whether or not generic equivalents are available. The government should establish the maximum price allowed for each medicine.*
2. Many originator brands and generics were procured by the government at high prices. Overall, the 75th percentile price for originator brands was 7.68 times the international reference price, and 2.26 times for the lowest priced generics. Therefore, 25% of the medicines were above even these high prices.  
*Suggestion: The 75th percentile price should be the maximum price paid by the government.*
3. The variability of mark-ups in the public and private sectors might be a reflection of problems in the government pricing system and regulation. This might lead to reimbursement problems for third party payers.  
*Suggestion: Regulate the mark-ups on medicines. Mark-ups applied in the private and public sector could differ because of different administration costs.*
4. Government procurement prices of some generics were low. The 25th percentile MPR was 0.8 and the lowest MPR was 0.3. Too low prices could result in quality problems.  
*Suggestion: Is it time to look at the procurement price in relation to the quality? An appropriate drug pricing strategy should be employed to create benefits for both buyers and manufacturers.*
5. The difference between patient prices and procurement prices of originator brands in the public sector is higher than in the private sector (32% to 20%).  
*Suggestion: The government should pass on low procurement prices to patients to improve access to more affordable treatments. Taxes and duties should not be applied to essential medicines.*
6. The mark-up of generics in the public and private sector is higher than originator brands. But the prices of originator brands are up to about 4 times that of generic equivalents.  
*Suggestion: The percentage mark-up should be regulated but vary according to the medicine price. The margin on high-priced medicines should be lower than the margin on lower-priced medicines (regressive margins) as an incentive for the dispensing of lower priced products.*
7. The affordability of treatments for common diseases with lowest priced generics is generally less than 1 days' wage but many originator brands are not affordable.  
*Suggestion: Promotion of the use of generics should be strengthened to doctors as well as patients.*
8. The price component study revealed differences between the hospital procurement prices and the prices reported to the Thai FDA, questioning the reliability of the reported prices.  
*Suggestion Verification of reported prices is needed. Also prices, availability and affordability should be regularly monitored in Thailand.*

## Recommendations of the investigators

Research is needed on the feasibility and impact of price regulation. This could be undertaken by establishing models that simulate different pricing strategies. Assessment would be needed on the impact of the different strategies on:

- Medicines on the Thai drug list
- Healthcare expenditure, financing, and the pharmaceutical market.
- All stakeholders in the regulation, provision and use of medicines including consumers, pharmacies/drug stores, hospitals, wholesalers, importers, manufacturers, exporters, FDA regulators and others.

If the government considers there is a need to implement price regulations, all stakeholders should be consulted as part of the review.

A price regulation system should be implemented at every level of the supply chain: manufacturers to hospitals/drug stores and hospitals/drug stores to patients. Price regulations, such as maximum selling prices or maximum wholesale/retail mark-ups, should be implemented and enforced.

The distribution chain should be analysed for efficiency, probity, competitiveness, with steps taken to correct bottlenecks e.g. by contracting to private and not-for-profit logistics and security organizations. The distribution chain should be regularly monitored with the results made public.

A mix of policies will likely be needed to make medicines more affordable and available. Although further investigation is needed to better understand the causes of high prices and poor availability, and the consequences of pricing policy options, the results of this survey provide broad directions for future research and action.

This study has been valuable in identifying current issues regarding medicine prices and availability, and the affordability of key medicines for the treatment of common conditions. The results highlight priority areas that need to be addressed by the Ministry of Public Health and others. Broad discussions are needed on policies that will result in improved medicine affordability and availability in Thailand.

### **Further information**

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The full survey report and data can be found at:  
[www.haiweb.org/medicineprices](http://www.haiweb.org/medicineprices)