

Medicine prices, availability, and affordability in Vietnam

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Citation: Nguyen AT, Knight R, Mant A, Cao QM, Auton M. Medicine prices, availability, and affordability in Vietnam. *Southern Med Review* (2009) 2; 2:2-9

Abstract

Objective: To assess the price, availability and affordability of a sample of medicines in Vietnam.

Methods: Data on the price and availability of 42 medicines were collected using the standard World Health Organization/Health Action International (WHO/HAI) methodology in five geographical areas in Vietnam. The median price of these medicines was compared with the Management Science for Health international reference prices (IRPs), expressed as median price ratios. Affordability was measured as the number of days' wages required for the lowest-paid unskilled government worker to purchase one course of therapy. Of the 42 medicines studied, 15 were chosen for international comparison, which were included in at least 80% of other country surveys using the WHO/HAI methodology.

Results: Public sector availability of generic medicines was 33.6%. The median public procurement price was 1.82 times the IRPs for generics, but for some individual medicines it was less than half the IRP. The price to patients in public outlets was higher than in private pharmacies. Adjusted for Purchasing Power Parity in 2005, the lowest generic prices in private pharmacies were still 8.3 times the IRPs. Treatments were thus unaffordable for a large part of Vietnam's population.

Conclusions: Medicines in Vietnam were high in price, and low in both availability and affordability, especially in the public sector. To make public facilities a primary treatment option for the poor, Vietnam must reduce medicine prices in this sector by improving procurement efficiency, ensuring and promoting low-priced generics, and regulating reasonable mark-ups.

Keywords: Medicine prices, availability, affordability, pricing policy, Vietnam.

Introduction

Globally, medicine prices are often high and unaffordable not only for large sectors of the population in low- and middle-income countries, but also for sizeable segments of the population without adequate social protection or insurance in high income countries^{1,2}. Too little is known, however, about the actual prices people pay for medicines and how these prices are set. Patients, and even government authorities dealing with medicines, often do not know what the lowest prices are and how they vary³. Sound national medicine pricing policy needs to be evidence based and grounded in reality, requiring empirical data about the real affordability of medicines for the whole population.

Vietnam's progress in health care is greater than would be expected from its development level. Several health-related targets set under the Millennium Development Goals have been attained well ahead of time⁴. Yet, Vietnam's total spending on

health was at 5-6 % of gross domestic product (GDP) from 2000 to 2005⁵. Government health spending accounts for only a quarter of total expenditure, and the remaining three-quarters is drawn from direct patient out-of-pocket payments⁵⁻⁷.

Medicine expenditure accounts for a large component of total health care costs. In 2005, Vietnam spent Vietnamese dong (VND) 50,530,657 million on health (USD 1 = VND 15,907.00), of which 53.3% was for medicines, an almost threefold increase in absolute terms from 2000⁵. Rising prices for medicines have been reported to account for most of this increase⁸. From 2003 to 2004, prices of some medicines soared fourfold⁹, and the medicine and health component of the consumer price index (CPI) increased by 13.8%, almost doubled the CPI¹⁰.

In addition, there is evidence that pharmaceutical companies set medicine prices in Vietnam higher than in some other countries. For example, prices of locally produced antiretroviral medicines (ARVs), although considerably lower than those of

imported ARVs, were still five to seven times higher than current international lowest prices¹¹. Another example is that the retail price of 100 tablets of 150mg ranitidine (Zantac) in Vietnam was higher than that in Australia, New Zealand, and Pakistan¹². This made medicines even less affordable for the Vietnamese population at a time when the Gross National Product per capita of Vietnam was USD 240, lowest among these countries.

To provide comparable, evidence-based information for policy makers, a survey to measure the price, availability and affordability of a standardized set of medicines in Vietnam was undertaken.

Methods

The methodology developed by the World Health Organization (WHO) and Health Action International (HAI) for assessing medicine price, availability, and affordability was used in this study as follows¹.

Sampling

A systematic sampling method was used to select medicine outlets. Five geographical regions in Vietnam, namely Hanoi (Capital), Haiphong (North), Danang (Central), Daklak (Central Highland) and Ho Chi Minh City (South) were selected as survey areas. In each area, the main general public hospital was chosen as the sampling site. Six other public health facilities reachable within four hours' drive from the main hospital were also randomly selected. The for-profit medicine outlets of these public health facilities, where patients are charged for medicines, constituted the public sector sample. The private sector sample was identified by choosing one private, for-profit retail pharmacy closest to each of these public outlets. In each public health facility, apart from its for-profit medicine outlet, the not-for-profit component of the pharmaceutical department, which mainly serves insured patients, was selected as the other sector.

Medicines

Of the 42 medicines included in the survey, 25 belong to the list of core medicines included by WHO/HAI, and 17 were selected as supplementary medicines (Table 1). The core list medicines were selected on the basis of global disease burden while the supplementary list was chosen for local clinical relevance, with input from practicing pharmacists, academics, and experts from the Drug Administration of Vietnam and WHO. For each medicine, information was collected on the availability and price of both the innovator brand (IB), and the lowest-priced generic equivalent (LPG) found at each medicine outlet.

Data collection and entry

Twenty trained data collectors in pairs visited medicine outlets and recorded data on a standardized form, with the support of a representative of the provincial health bureau in each survey area. Four types of prices were recorded namely procurement price and patient price in public medicine outlets, patient price in private pharmacies and insured patient price in the

Table 1. Basket of 42 medicines surveyed in Vietnam in 2005

No	Medicine Name	Core List (yes/no)	International comparison
1	Aciclovir 200 mg capsule/ tablet	yes	yes
2	Amitriptyline 25 mg capsule/ tablet	yes	yes
3	Amoxicillin 250 mg capsule/ tablet	yes	yes
4	Atenolol 50 mg capsule/ tablet	yes	yes
5	Beclomethasone 50 mcg/ dose inhaler	yes	yes
6	Captopril 25 mg capsule/ tablet	yes	yes
7	Carbamazepine 200 mg capsule/tablet	yes	no
8	Ceftriaxone 1 g/vial injection	yes	yes
9	Ciprofloxacin 500 mg capsule/tablet	yes	yes
10	Co-trimoxazole 8+40 mg/ml suspension	yes	yes
11	Diazepam 5 mg capsule/ tablet	yes	no
12	Diclofenac 25 mg capsule/tablet	yes	no
13	Fluoxetine 20 mg capsule/tablet	yes	yes
14	Glibenclamide 5 mg capsule/ tablet	yes	yes
15	Hydrochlorothiazide 25 mg capsule/tablet	yes	yes
16	Indinavir 400 mg capsule/ tablet	yes	no
17	Losartan 50 mg capsule/ tablet	yes	no
18	Lovastatin 20 mg capsule/ tablet	yes	no
19	Metformin 500 mg capsule/ tablet	yes	no
20	Nevirapine 200 mg capsule/ tablet	yes	no
21	Nifedipine Retard 20 mg tablet	yes	no
22	Omeprazole 20 mg capsule/ tablet	yes	yes
23	Phenytoin 100 mg capsule/ tablet	yes	no
24	Ranitidine 150 mg capsule/ tablet	yes	yes
25	Salbutamol 0.1 mg/dose inhaler	yes	yes

No	Medicine Name	Core List (yes/no)	International comparison
26	Acetylsalicylic acid 500mg tablet	no	no
27	Amoxicillin + Clavulanic acid 500mg/125mg tablet	no	no
28	Cefuroxime 250mg tablet	no	no
29	Chlorpheniramine 4mg tablet	no	no
30	Clotrimazole vaginal 100mg tablet	no	no
31	Co-trimoxazole 480mg tablet	no	no
32	Dexamethasone 0.5mg tablet	no	no
33	Digoxin 0.25mg tablet	no	no
34	Enalapril 5mg tablet	no	no
35	Erythromycin 250mg tablet	no	no
36	Furosemide 40mg tablet	no	no
37	Gliclazide 80mg tablet	no	no
38	Ketoconazole 5g, 2% cream	no	no
39	Loratadine 10mg tablet	no	no
40	Metronidazole 250mg tablet	no	no
41	Nifedipine 10mg tablet	no	no
42	Piroxicam 20mg tablet	no	no

pharmaceutical departments of public hospitals. The procurement price data were collected only if public medicine outlets had invoices available as evidence. The unit prices were calculated and checked by area supervisors at the end of each day of data collection. Five area supervisors were also responsible for validation of 10% of all data collected from medicine outlets. Checked data were then entered into a pre-programmed Medicine Price Workbook (version 4.01) using a double entry technique. Data checking function of the Workbook was run to highlight outliers for verification.

Data analysis

Price results were calculated for each medicine only if the medicine was found in at least four medicine outlets and were reported as median price ratios (MPR) for each medicine type in each sector. The MPR is the ratio of a medicine's median price across outlets to a median international reference price (IRP), an external standard to make drug-drug comparisons. In this study, the median unit prices in the Management Sciences for Health (MSH) Price Indicator Guide were used as the IRP because of their wide availability and annual updating. The 2004 MSH IRPs were used as defaults since the Vietnam survey was conducted

in 2005. They are the median of actual procurement prices offered by not-for-profit suppliers or international tender prices to developing countries for multi-source products¹³. Cut-off points of MPRs of 1.0 and 1.5 for public procurement price and public patient price, respectively have been considered acceptable local price ratios¹⁴. Affordability was assessed as the number of days' wages the lowest paid un-skilled government worker would have to earn to purchase one course of treatment for common health conditions.

Local comparison analysis was conducted across five surveyed areas namely Hanoi, Haiphong, Danang, Daklak and Ho Chi Minh City following the method published by Babar et al¹⁵. Only medicines found in all five regions were selected for price comparison using a Kruskal-Wallis test with $p < 0.05$ being used as the significance level.

For the international comparison, 15 out of the 42 medicines studied, were chosen (Table 1) following the methodology of a secondary analysis published by Cameron et al¹⁶. Vietnam was not included in the secondary analysis since its data were not available in the HAI global database of survey results. Therefore, in this study the data from Vietnam were compared with the results reported by Cameron et al to assess Vietnam's position regarding medicine price, availability and affordability among countries of similar economic status as well as within the same region.

In 2007, Vietnam was ranked in the low income group according to the World Bank and in the WHO Western Pacific Region (WPR). India was excluded from the comparison, although also in the low income group in 2007, because of the unique nature of the Indian pharmaceutical market.

Most comparable countries conducted their survey in 2004, using MSH 2003 median unit prices as the IRP. Therefore, the medicine price data in Vietnam for international comparison were adjusted from 2004 MSH IRPs to 2003 MSH IRPs, taking into account a correction for inflation or deflation between the survey year 2005 and the base year 2004 (using CPI) and adjusting for the purchasing power parity (PPP) of the Vietnam currency (VND)¹⁷.

Although the patient price data were corrected for inflation/deflation and also adjusted for the PPP of VND, the procurement price data were not adjusted for PPP, but for exchange rates using the official exchange rate for the USD in the survey year. This was because most public procurements should have been able to purchase comparable prices by using competitive international tenders, regardless of the purchasing power of the local currency.

Results

Of the outlets sampled, data for procurement prices were collected from 31 public medicine outlets, public patient prices from 33 public medicine outlets, private patient prices from 33 private pharmacies, and public insured patient prices from 35 public hospital pharmaceutical departments.

Medicine availability

The mean availability of IBs and LPGs was 19.6% and 33.6%, respectively in the public sector, 34.7% and 58.1%, respectively in the private sector, and 10.9% and 40.4%, respectively for insured patients in the not-for-profit public sector. Low availability of LPGs was also found for essential medicines. Of the 42 medicines studied, 35 were listed in the Vietnam National Essential Drug List¹⁸. A separate availability analysis for these 35 medicines showed that in the public sector, mean availability was 19.6% for IBs and 37.1% for LPGs.

Overall, all sectors showed greater availability of LPGs than IBs. However, the opposite applied to some individual products, namely atenolol, nifedipine, and salbutamol inhaler. Data for beclometasone inhaler and fluoxetine were not recorded in any medicine outlets.

Medicine prices

The public procurement sector prices were 8.29 times the IRPs for 23 IBs and 1.82 times the IRPs for 33 LPGs (Table 2). Prices of seven IBs, acetylsalicylic acid, atenolol, ciprofloxacin, diclophenac, loratadine, nifedipine, omeprazole, and piroxicam and of one LPG, piroxicam, exceeded 10 times the IRPs. The public procurement system seemed highly variable, since it could also procure some extremely cheap LPGs such as dexamethasone and losartan with prices of 0.4 and 0.21 times the IRPs, respectively. Prices for individual medicines were fairly stable across outlets for IBs, whereas they varied dramatically for LPGs. Some medicines had prices varying between less than one to tens of times the IRPs, an example being piroxicam (0.85 times the IRPs to 23.80 times the IRPs), showing both reasonable and excessive prices for the same medicine.

Following adjustment for PPP in 2005, the public patient sector prices were 46.58 times the IRPs for IBs and 11.41 times the IRPs for LPGs; 44.61 for IBs and 8.30 for LPGs in the private sector and 38.88 for IBs and 8.59 for LPGs for insured patients. In the private sector, among 24 medicines for which both IB and LPG were found together, IBs were 5.6 times more expensive than LPGs. This sector also witnessed substantial price variability across outlets for both individual LPGs and IBs.

Affordability

Affordability was largely dependent on the choice of therapeutic classes, types of medicines and sectors. For example, in 2005 a worker would have had to work 0.7 days to treat an acute respiratory infection with LPG amoxicillin (250 mg three times daily in 7 days) but would pay 15.9 days' wages with LPG ceftriaxone (1vial 1g daily in 7 days) in the public sector. The same treatment required the worker to earn 83 days' wages extra to afford IB ceftriaxone rather than LPG (98.9-15.9).

With chronic diseases such as a peptic ulcer, a one-month treatment using IB ranitidine (150 mg twice a day) cost 22.1 and 21.1 days' wages in the public and private sector, respectively. While low-priced generics of ranitidine were available in the private sector, the LPG ranitidine would have cost the worker

Table 2. Median price ratio* of IBs, LPGs in public procurement sector, public sector, private sector, and other sector (not-for-profit public sector) in Vietnam in 2005.

Medicine types	Public procurement prices	Public sector prices	Private sector prices	Other sector prices
	Adjusted for official exchange rate Q4 2005†	Adjusted for PPP of VND in 2005 ‡		
IBs	8.29	46.58	44.61	38.88
LPGs	1.82	11.41	8.30	8.59

IB=innovator brand. LPG=lowest-priced generic. PPP: Purchase Power Parity. VND: Vietnam currency unit. *Ratio of the median local price to the MSH international reference price. †Official exchange rate for US dollar in quarter 4, 2005: USD 1= VND 15,907.00. ‡PPP of VND in 2005: international dollar 1=VND 3,218.607.

Information on the official conversion rate for USD was from The International Monetary Fund: International Financial Statistics³² and source of national PPP was The International Monetary Fund: World Economic Outlook Database³³.

1.3 days' wages. Meanwhile, in the public sector, the so-called LPG ranitidine would have cost 13.9 days' wages, an added 12.6 days' wages compared with the private sector. If prescribed IB omeprazole (20 mg daily) instead, the cost would have been 50.9 days' wages in the public sector and 48.9 days' wages in the private sector (Figure 1).

Variation across regions

Consistent with the national trend, the mean availability of sampled medicines was higher for LPGs than for IBs and higher in the private sector than in the public sector for both IBs and LPGs in all five regions. The two main hubs for distribution of pharmaceuticals to the North and South of Vietnam, Hanoi and Ho Chi Minh City, had the highest mean availability among regions. In Hanoi, 72.4% LPGs and 43.2% IBs were available in the private sector and in Ho Chi Minh City 65.3% and 52.4%. Haiphong had the lowest mean private sector availability of 39.8% for LPGs and 15.6% for IBs.

Of all 84 medicines studied (42 IBs and 42 LPGs), 12 medicines were found in all five regions. A Kruskal-Wallis test revealed no significant difference in MPRs level of these 12 medicines across five regions with $\chi^2(4, n=120) = 1.763, p = 0.779$.

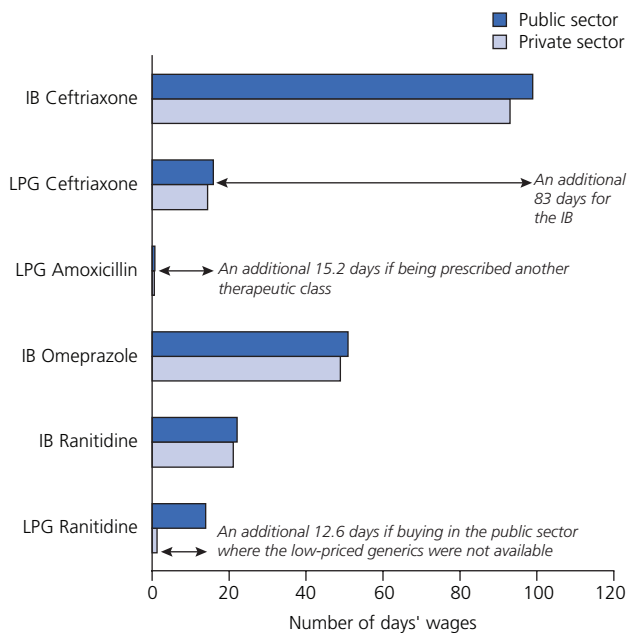


Figure 1: Differences in affordability of a treatment for an acute respiratory infection and a one-month treatment for a chronic peptic ulcer between therapeutic classes, types of medicines and sectors in Vietnam.

IB=innovator brand. LPG=lowest-priced generic.

International comparison

Medicine availability

The mean percentage availability of the sample of 15 LPGs in Vietnam was 34.8% in the public sector and 56.0% in the private sector, similar to the average of country-level mean percentage availability of medicines across World Bank low income countries. Compared with the Western Pacific Region, Vietnam had lower availability of medicines in the public sector but slightly higher availability in the private sector.

Medicine prices

While other low income countries achieved an average public procurement price of 17% higher than the IRPs for LPGs, the Western Pacific Region and Vietnam both had procurement prices averaging 44%-45% more than the IRPs (Figure 2). For individual medicines in this sector, results varied and were not consistent with the overall data for Vietnam and the Western Pacific Region. The price for LPG amoxicillin 250 mg was the same in Vietnam and in the Western Pacific Region, whereas for LPG glibenclamide 5 mg, it was fourfold higher in Vietnam than in the Western Pacific Region. In contrast, the price was lower in Vietnam for LPG ciprofloxacin 500 mg (1.45 vs. 2.55).

Medicine prices to patients in Vietnam were higher in the public sector than in the private sector for both IBs and LPGs (32.12 times the IRPs for IBs and 7.53 times the IRPs for LPGs in the public sector versus 31.75 for IBs and 6.09 for LPGs in the private sector). This trend deviated from other countries where medicines in the private sector were often more highly priced¹⁶. Compared with the average level in the Western Pacific Region, Vietnam had markedly lower prices for LPGs in both the public

and private sector, but only slightly lower prices for IBs in the private sector. The trend was similar for individual amoxicillin 250 mg, whereas it was in the opposite direction for salbutamol 0.1 mg/dose. Ciprofloxacin 500 mg was recorded as having substantially lower prices for both IBs and LPGs in both sectors in Vietnam than in the Western Pacific Region (Table 3).

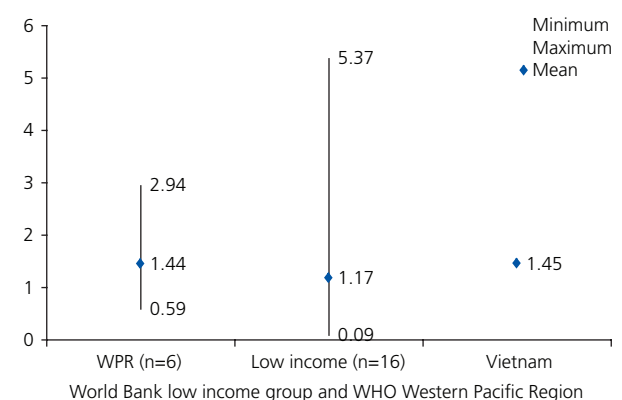
In the private sector in Vietnam, the median brand premium (the percentage difference in price between IBs and LPGs for matched pairs of medicines) was 460%, much higher than the average brand premium of 337.7% in this sector among the World Bank low income group¹⁶. For some individual medicines, such as ciprofloxacin 500 mg capsule/tablet or omeprazole 20 mg capsule/tablet, the figure was as high as 2,233.3% and 2,560.1%, respectively.

Affordability

Despite the substantially lower prices, medicines in Vietnam were much less affordable than in the Western Pacific Region. Table 4 summarizes the affordability of treating one acute infection and three chronic illnesses in different sectors for LPGs and IBs between Vietnam and the Western Pacific Region.

Discussion

In 2005, Vietnam faced the inadequacy of the public system in terms of medicine supply for the poorest sector. In contrast to elsewhere, Vietnam medicine prices in the public sector were higher than in the private sector. Public procurement and public patient prices were high for both LPGs and IBs. While LPGs were of low availability, a large number of IBs were found in public medicine outlets. Medicines were unaffordable for the lowest paid unskilled government worker, thus being unaffordable for the large percentage of the population who earn less than this benchmark.



Source: Adapted from Cameron A. et al. 2009¹⁶

Figure 2: Median price ratio* in public procurement for LPG medicines in Vietnam in comparison with those in the World Bank low income group and the WHO Western Pacific Region.

WPR: the Western Pacific Region. *Ratio of the median local price to the MSH international reference price.

Table 3. Median price ratios* of public procurement prices, public patient prices, private patient prices for LPG medicines, and private patient prices for IBs in Vietnam in comparison with those in the Western Pacific Region in the base year 2004.

	Public procurement prices		Public patient prices for LPGs		Private patient prices for LPGs		Private patient prices for IBs	
	WPR ¹⁶	Vietnam	WPR ¹⁶	Vietnam	WPR ¹⁶	Vietnam	WPR ¹⁶	Vietnam
Median across basket of 15 medicines	1.44 (n=6)	1.45	11.95 (n=4)	7.53	11.25 (n=6)	6.09	34.21 (n=5)	31.75
Amoxicillin 250 mg capsule/tablet	1.23 (n=4)	1.20	9.32 (n=3)	6.96	11.08 (n=5)	6.09	26.23 (n=2)	†
Ciprofloxacin 500 mg capsule/tablet	2.55 (n=1)	1.45	81.71 (n=1)	7.53	32.94 (n=4)	5.65	195.96 (n=3)	131.80
Glibenclamide 5 mg capsule/tablet	1.68 (n=4)	6.67	56.97 (n=1)	36.51	34.59 (n=4)	30.43	99.57 (n=3)	160.64
Salbutamol 0.1 mg/dose inhaler	0.95 (n=4)	†	4.64 (n=2)	†	4.32 (n=6)	5.56	8.60 (n=5)	9.88

Data for WPR are mean (number of surveys). WPR: the Western Pacific Region. LPG=lowest-priced generic. IB=innovator brand. *Ratio of the median local price to the MSH international reference price. † median price ratio was not calculated since medicine prices were found in less than four medicine outlets

Lack of availability of low-priced generics in the public sector made the lowest-priced generics in this sector for some medicines (such as ranitidine) still more than ten times the IRP. Adjusted for the PPP in 2005, the price of LPG ranitidine in the public sector was 27.42 times the IRP, while in the private sector it was 2.52 times the IRP. Hence, simply promoting the use of generics will not result in savings for patients without mechanisms to ensure a low price for generics. Fixing prices through comparative pricing systems, where the price of the drug of interest is compared with those of similar products within a country or of identical or interchangeable products in other countries, may be an option^{19,20}. A more flexible alternative is a reference pricing system where a reimbursement ceiling is set for a drug based on the prices of equivalent products already marketed²¹.

In 2005, the public procurement system was found to be inefficient as Vietnam had to purchase LPGs at a price 82% higher than the IRP. Due to lack of a sound and clear regulation of mark-ups in the public sector at the time of the survey, there were mark-ups of 13.8% for IBs and 26.8% for LPGs. High mark-ups on high procurement prices led to high patient prices in this sector. To make public facilities a primary treatment option for the poor, Vietnam must reduce medicine prices in this sector by improving procurement efficiency and regulating reasonable mark-ups. The implementation of these interventions may be feasible since financing for medicines in the public sector remains partly within the government's control.

Unlike findings from almost all other comparable low income and Western Pacific countries, where public sector prices were usually lower than or equal to private sector prices¹⁶, a lower private sector price in Vietnam reflected the role of this sector in supplying medicines to the population. However, when buying a sample of 15 medicines from private pharmacies in 2004, patients still had to pay 6.09 times the IRPs even for the LPGs. The situation was worse if patients were prescribed IBs, which had a brand premium of 460% in the private sector. These results indicate huge scope for reducing drug spending or creating efficiencies with more people getting treatment with the same expenditure through appropriate use of generic medicines. Nevertheless, to ensure the success of a strong generic policy, apart from mechanisms to ensure the low price of generics, four preconditions must be met: the existence of supportive regulations; the operation of reliable quality assurance; the attainment of professional and public acceptance; and the existence of financial incentives²².

Affordability of medicines remains a major problem for Vietnam. Results from this study, however, show that affordability varied with therapeutic classes and types of products. Therefore, improvement in the rational use of medicines and patient choice is likely to play an important future role, especially given that self-treatment and irrational prescribing and dispensing are common in Vietnam²³⁻²⁶. Interventions that have proved effective in developing countries include financial measures (e.g. direct financial incentives)²⁷ and professional measures

Table 4. Number of days' wages of the lowest-paid unskilled government worker needed to purchase a course of treatment in Vietnam in comparison with those in the Western Pacific Region.

	Public sector, LPG		Private sector, LPG		Private sector, IB	
	WPR ¹⁶	Vietnam	WPR ¹⁶	Vietnam	WPR ¹⁶	Vietnam
Adult respiratory infection; amoxicillin 250 mg capsule/tablet, three per day for 7 days	0.4 (n=3)	0.7	0.4 (n=4)	0.6	0.5 (n=2)	†
Diabetes; glibenclamide 5 mg capsule/tablet, two per day for 30 days*	0.7 (n=1)	2.6	0.7 (n=4)	2.1	1.6 (n=3)	11.3
Ulcer; ranitidine 150 mg capsule/tablet, two per day for 30 days*	1.2 (n=4)	13.9	1.7 (n=6)	1.3	5.5 (n=3)	21.1
Asthma; salbutamol 0.1mg/dose inhaler, 200 doses	1.1 (n=2)	†	0.7 (n=6)	3.1	1.4 (n=5)	5.5

Data for WPR are mean (number of surveys). WPR: the Western Pacific Region. LPG=lowest-priced generic. IB=innovator brand. *One month has been used as a course of treatment for chronic illnesses. † number of days' wages was not calculated since medicine prices were found in less than four medicine outlets

(e.g. standard treatment guidelines; essential drug lists; drug and therapeutics committees; problem-based basic professional training; and targeted in-service training of health workers)²⁸. Multi-component interventions have so far proved to be a good way to improve pharmaceutical practice in Vietnam and are thus likely to hold the most promise for better access to more affordable medicines for the whole community^{29,30}

This study only gauges the cost of a single medicine, whereas there were often more than three medicines in one prescription^{23,31}. The present study also does not measure other treatment costs such as consultation fees and diagnostic tests. Moreover, many Vietnamese earn less than the lowest-paid government worker. Therefore, unaffordability of medicines in Vietnam is likely to be underestimated. Compared with those in the Western Pacific Region, medicines in Vietnam were less affordable despite having markedly lower prices. This result indicates a much lower average salary level in Vietnam than in the Western Pacific Region. While improving people's incomes across society is a long term goal, a new financing approach such as universal health insurance might be a solution that Vietnam needs to achieve soon.

The significance of this study is that, to our knowledge, it provides the most thorough picture of medicine prices in Vietnam to date, using the standardized WHO/HAI methodology making it possible to compare results with those in other countries at the same development stage and within the same region, a task that previous studies failed to achieve¹. Moreover, the Vietnam analysis shows significant intra-regional differences. Although the inter-regional analysis cannot fully explore these features, they are critically important data for understanding within-

country pharmaceutical trends and hence, for national policy formulation and analysis

Contributors

All authors contributed to the paper's conception and design. ATN and MA did the analysis and interpretation of the data. ATN drafted the paper with the contribution of RK, AM, QMC and MA. All authors participated in critical revision and have approved the final version for submission.

Conflict of interest statement

We declare that we have no conflict of interest.

Acknowledgements

We would like to express our gratitude to Ms. Alexandra Cameron (Coordinator Medicine Pricing Project, WHO) for providing data used in the international comparison part of the paper and for giving valuable comments on an early draft. We thank the Vietnam team who conducted the survey of medicine prices and availability. We are grateful to the WHO for financial and technical support of the survey, as well as the Ministry of Health of Vietnam for administrative support and endorsement of the project. We also thank the Ministry of Education and Training of Vietnam, Vietnam Government for providing a scholarship to Anh Tuan Nguyen to follow up the medicine prices survey and pursue his PhD in medicine prices and pricing policy in Vietnam. The views presented in this paper are those of individual authors and do not represent the views of their affiliated institutions.

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