

**A Survey of Medicine Prices, Availability and  
Affordability in Shanghai, China  
using the WHO/HAI Methodology**

**Research Report**

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## Contents

Acknowledgements.....	3
Executive Summary.....	4
Abbreviations and Acronyms.....	8
Introduction.....	9
Methodology.....	14
Results.....	20
Availability of medicines in the public and private sectors.....	20
Public sector availability.....	20
Private sector (Retail Pharmacies) availability.....	21
Availability of medicines across public and private sectors.....	21
Prices of medicines in the public and private sector.....	23
Public sector patient prices.....	23
Private sector patient prices.....	25
Comparison of prices in the public and private sectors.....	26
Procurement prices in the public sector.....	27
Comparison of hospital procurement prices and hospital patient prices.....	29
Price comparisons across the four survey areas.....	30
Affordability.....	30
Price components and mark-ups.....	33
Discussion.....	34
Availability in the public and private sectors.....	34
Prices in the public and private sectors.....	36
Public procurement prices.....	36
The affordability of treatments.....	37
Price regulation policy and price components.....	38
Conclusions.....	39
Recommendations.....	40
References.....	42
Annex 1 List of medicines surveyed.....	43
Annex 2.....	44
National Pharmaceutical Sector form.....	44
General information on the pharmaceutical sector.....	45
Distribution.....	46
Retail.....	46
Private sector.....	46
Financing.....	47
Government price policy.....	47
Public sector.....	47
Private retail sector.....	47
“Other” sector.....	48
Insurance, risk-sharing or prepayment schemes.....	48
Medicine Price Data Collection form.....	49
Use one form for each health facility and pharmacy.....	49
Verification.....	50
Annex 3: MEDICINE PRICE DATA COLLECTION FORM.....	51

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## **Executive Summary**

From September to November 2006, the Department of Health Economics, School of Public Health, Fudan University, China surveyed the price and availability of 41 medicines in Shanghai using a standardized methodology developed by the World Health Organization (WHO) and Health Action International (HAI). Of these medicines, 19 were core medicines from the WHO/HAI list, and 22 were supplementary medicines. Data was collected from a total of 30 public sector facilities and 20 private retail pharmacies in Shanghai city plus four districts; Xuhui, Zhabei, Putuo and Huangpu. The affordability of standard treatments for a pre-selected list of common conditions was assessed in both sectors by determining the number of days the lowest paid unskilled government worker would have to work to pay for a course of treatment.

In the survey, prices are expressed as Median Price Ratios (MPR) rather than actual prices. The MPR is the ratio of the local median unit price across the facilities surveyed to an international reference price. For both core medicines and supplementary medicines, prices from the Management Sciences for Health International Drug Price Indicator Guide 2005 were used as the reference. Ratios are used to gauge whether prices are high or low compared to an international standard.

## **Findings**

1. Low availability of both innovator brand medicines and generic alternatives was seen in the private pharmacies surveyed. This may indicate that private pharmacies widely dispense OTC drugs.
2. In the public sector availability was low, even for the medicines on the national essential drug list.
3. Public hospitals had greater availability of generics compared to innovator brands.
4. The prices of innovator brands were considerably higher than those of their generic equivalents in both the public and private sector.
5. The median price of some medicines was lower in private pharmacies than in the public sector, for both innovator brands and lowest price generic equivalent. The prices of some medicines are identical for both the innovator brand and the lowest price generic equivalent, in both sectors.
6. Low affordability was observed for some common ailments, in particular non-communicable diseases such as hypertension, diabetes, etc.

## **Recommendations**

1. There is a need for a rational drug pricing policy, and for that policy to be incorporated into the national drug policy. The national government must implement an Essential Medicines Policy to reduce the number of medicines available in the country, and to reduce the available preparations to a manageable number which can be effectively supplied, monitored and controlled.

2. Government should reform the remuneration mechanism to hospitals and physicians in the context of improving access to medicines.
3. Emphasis should be placed on generic prescription. The prescribers and dispensers, as well as consumers awareness needs to be increased in this respect so that low priced generics are more widely accepted and used.
4. Government counts the essential medicine into the basic healthcare service package. With prescription, patients can have access to any kind of essential medicine from health care facilities and retail drug stores after paying for prescription fee. However, it's free for those poor, old, children and social vulnerable population.
5. In order to avoid a conflict of interest for doctors, prescribing and dispensing should be separated. Authorities should minimize the irrational use of drugs and the prescription of costly products when less expensive drugs of equal efficacy are available. It is necessary to establish a fair, competitive platform between private pharmacies and public hospitals so that consumers can get drugs either in pharmacies or in hospitals. This measure is needed to improve access to medicines and make them more affordable.
6. Regulate prices of innovator products. The government should regulate the manufacturer's selling price and fix the mark-up in distribution chain for innovator brand products, as these are main contributors to the retail price.
7. The Department of Drug Pricing, National Development and Reform of Commission should launch an investigation into the production costs and actual retail prices of drugs and then move to finalize the price reduction plan.



## **Abbreviations and Acronyms**

EDL Essential Drug List

HAI Health Action International

IB Innovator Brand

IRP International Reference Price

LPG Lowest Price Generic Equivalent

MPR Median Price Ratio

MSH Management Sciences for Health

MSP Manufacturer's Selling Price

NA Not Available

WHO World Health Organization

## **Introduction**

During the period of September to November 2006, a field study on measuring medicine prices and availability was conducted in Shanghai, China. The study design was based on the standard methodology developed by the World Health Organization (WHO) and Health Action International (HAI) using a standard list of medicines (plus locally important supplementary medicines) to compare the prices and availability of medicines in different health sectors and regions in the province. The aim of the study was to provide a comprehensive picture of medicine prices in Shanghai and to compare prices, availability, affordability and supply chain markups in the public health sector and private retail pharmacies. The study was designed to answer the following questions:

- What are the prices people pay for innovator brands and generic equivalents and how do these prices differ between the public sector and the private sector?
- What price is the government paying for medicines and how does this compare with the price the patient pays?
- How do local prices compare to international reference prices?
- What is the availability of the medicines surveyed in each sector?
- Does prices and availability vary in different districts of Shanghai?
- What markups are applied in the supply chain?
- How affordable are standard treatments for ordinary citizens in Shanghai?

## **Shanghai Profile**

Shanghai is in the eastern part of China with a population of nearly 16 million people. There are 16 districts and 4 counties in Shanghai. In 2005, the GDP per capital was 59600

RMB Yuan (7450 USD). In the same year the health status of the Shanghai population almost reached the average level for development countries; the average life expectancy was 80.29 years old (78.08 years for male and 82.48 years for female). The infant mortality rate, in continuous decline, was 3.78 per 1000 live births. Because of the high life expectancy and low infant mortality rate, the ageing population has become a big problem in Shanghai. According to the 2003 population statistics report, 19% of the Shanghai population was over 60 years old , and 15% of residents were over 65 years old. Two-thirds of the medical insurance beneficiaries are elderly, and 25% of retirees spend almost 60% of the total health insurance fund.

Top 10 disease cause of death and proportion in 2005 Shanghai

Cause of death in order	Death rate (/100thousands)	Percentage of total deaths (%)
Circulatory system	258.14	34.26
Cancer	222.82	29.58
Respiratory system	93.61	12.43
Injury	45.38	6.02
Internal system	30.28	4.02
Digestive system	19.85	2.63
Communicable disease and parasitosis	12.56	1.67
Psychosis	10.05	1.33
Urological and reproductive systems	7.74	1.03
Nervous system	7.20	0.96

The Urban Employee Basic Health Insurance System was established in China in 1999. By 2004, 7.90 million employees had joined the insurance scheme. Another 2.339 million population joined the rural cooperative medical scheme. The participation rate is up to 99.1%, with total premium reaching 490 million Yuan (RMB). In addition, 587 thousand population participate in the “township social insurance scheme”, which is specially

designed for farmers who have lost their land.

For the Urban Employee Basic Health Insurance System, all kinds of urban enterprises (State owned, collectively owned, foreign invested, private, etc.), as well as State organs, institutions, associations, private non-enterprise units and their employees participate in the medical insurance schemes. The people's governments of provinces, autonomous regions and municipalities directly under the Central Government decide whether the village and township enterprises, urban individual businesses and their employees shall be covered by the system.

Medical costs are shared by the employing units, who pay a contribution equivalent to 10% of their total payroll, and individuals, who pay 2% of their wages. The contributions of medical insurance are therefore depended on the level of average annual salary of employees. Retirees are not required to pay a medical insurance contribution.

Contributions are divided into a pool of funds and individual accounts. All individual contributions, and 30% of the contribution paid by employing units, are put into the individual account and the rest is put into the pool of funds. The individual accounts are used to pay the medical costs of the individuals for minor diseases, while the pool of funds covers hospitalization and serious illness. When costs exceed a maximum threshold (about four time of the workers' annual average wages in respective localities) costs above the threshold are covered by supplementary insurance..

There are 428 hospitals in Shanghai, among which 33 are tertiary hospitals, 130 are

secondary hospitals and 227 are communities health centers. There is at least 1 community health center in each community. Private retail pharmacies have developed quickly. In Shanghai the number of retail pharmacies is about 2591, of which 1756 are chain drug stores. Some retail pharmacies have been selected as the target pharmacies of the social health insurance scheme.

Shanghai is one of the cities in China where a bulk purchasing policy for drugs is implemented. In the past 4 years, 80% of pharmaceuticals purchased by hospitals and 75% purchased by health insurance companies were procured through bulk purchasing. Drugs procured through pooled purchasing account for 80% of usage in ambulatory and emergency departments. Because drug procurement is predominantly unified and decided by the government, the effect of competition and price cutting is significant.

In addition, a policy of budget control on pharmaceutical expenditure was adopted in Shanghai in 2004. Purchasing and utilization of high-price drugs is not permitted beyond 30% of total drug expenditure in tertiary hospitals, 20% in secondary hospitals and 5% in community hospitals, respectively.



## Map of China ( Mainland )

### **Methodology**

#### **Objectives**

The objectives of the survey were to:

- Measure medicine procurement prices in the public sector.
- Compare the prices people pay for medicines, and their availability, in the public sector (public hospital clinics) and the private sector (retail pharmacies).
- Compare the prices and availability of medicines in four districts of Shanghai.
- Compare local prices with international reference prices.
- Assess treatment affordability for a selection of common conditions.
- Identify some price components in the public and private sectors.

#### **Sectors surveyed**

Medicine prices, availability, affordability and price components were measured in the public sector (public hospital clinics) and private sector (private retail pharmacies). In the public hospitals, two prices were surveyed: procurement prices and prices paid by patients. In the private sector, the price paid by patients (retail price) was surveyed. In both sectors, the availability of medicines on the day of data collection was also measured.

#### **Medicines surveyed**

Initially 62 medicines were selected for inclusion in the survey - 30 core medicines from the WHO/HAI list and 33 supplementary medicines. Following a pilot study, the list of medicines was modified as many medicines were either not available at all or the strength was not commonly used, and some selected medicines did not have reference prices.

Table 1 lists the WHO/HAI core medicines not included in the survey.

**Table 1 WHO/HAI core medicines not surveyed**

Medicine	Dose form & Strength	Reason for non-inclusion
Artesunate	100mg tabs	No malaria in Shanghai
Fluphenazine decanoate	25mg/ml injection	Not permit to be used in general hospitals or sold in private pharmacies
Amoxicillin	250mg cap/tab	500mg commonly used
Ciprofloxacin	500mg caps	250mg commonly used
Indinavir	400mg caps	Not found in Shanghai
Zidovudine	100mg caps	
Sulfadoxine+Pyrimethamine	(25+500)mg tabs	No malaria in Shanghai
Co-trimoxazole paed suspension	(8+40)mg/ml	Not available
Diazepam	5mg	Not commonly used
Fluphenazine decanoate	25mg/ml injection	Not available
Indinavir	400mg cap	Not commonly used
Nifedipine retard	20mg tab	30mg commonly used

A total of 41 medicines were included in the survey – 19 core medicines (Table 2) and 22 supplementary medicines (Table 3).

**Table 2 Core medicines surveyed**

Aciclovir 200mg cap/tab	Hydrochlorothiazide 25mg cap/tab
Amitriptyline 25mg cap/tab	Losartan 50mg cap/tab
Atenolol 50mg cap/tab	Lovastatin 20mg cap/tab
Beclometasone 0.05mg/dose inhaler	Metformin 500mg cap/tab
Captopril 25mg cap/tab	Nevirapine 200mg cap/tab
Carbamazepine 200mg cap/tab	Omeprazole 20mg cap/tab
Ceftriaxone 1g injection	Phenytoin 100mg cap/tab

Diclofenac 25mg cap/tab	Ranitidine 150mg cap/tab
Fluoxetine 20mg cap/tab	Salbutamol 0.1mg/dose inhaler
Glibenclamide 5mg cap/tab	

**Table 3 Supplementary medicines surveyed**

Albendazole 200mg cap/tab	Clarithromycin 250mg cap/tab
Alendronate 10mg cap/tab	Digoxin 0.25mg cap/tab
Amlodipine 5mg cap/tab	Fluconazole 150mg cap/tab
Amoxicillin 500mg cap/tab	Gliclazide 80mg cap/tab
Anastrozole 1mg cap/tab	Lisinopril 10mg cap/tab
Azathioprine 50mg cap/tab	Loratadine 10mg cap/tab
Cefuroxime 250mg cap/tab	Ketoconazole 200mg cap/tab
Cefradine 0.5g/vial	Nifedipine 30mg cap/tab
Ceftazidime 1g/vial	Rifampicin 150mg cap/tab
Cimetidine 400mg cap/tab	Simvastatin 20mg cap/tab
Ciprofloxacin 250mg cap/tab	Sodium Chloride 0.9% IV solution 500ml

Annex 1 lists the 41 medicines surveyed showing the target pack sizes for each. For each medicine, two types of product were surveyed:

- Innovator (originator) brand
- Lowest price generic equivalent

The innovator brand product and manufacturer was identified centrally, and the lowest priced generic equivalent was identified in each facility surveyed. Innovator brands of digoxin, rifampicin and sodium chloride 0.9% IV solution could not be identified so where not surveyed.

### **Sampling areas and facilities**

In order to obtain the data, we used the sampling method described in the WHO/HAI manual for selecting a representative number of public health facilities and pharmacies. Prices and availability were measured in public hospitals and private pharmacies in four

randomly selected districts, namely, Xuhui, Zhabei, Putuo and Huangpu. Five tertiary hospitals were also selected for surveying in Shanghai city. Table 4 summarizes the facilities surveyed.

**Table 4. Characteristics of the selected survey areas**

	<b>City</b>	<b>Xuhui</b>	<b>Zhabei</b>	<b>Putuo</b>	<b>Huangpu</b>
<b>Public hospitals (n = 30)</b>	5 tertiary	2 secondary 5 community health centers	1 secondary 5 community health centers	1 secondary 5 community health centers	1 secondary 5 community health centers
<b>Private pharmacies (n = 20)</b>		5 private pharmacies nearest to each selected public hospital	5 private pharmacies nearest to each selected public hospital	5 private pharmacies nearest to each selected public hospital	5 private pharmacies nearest to each selected public hospital

### **Data collection**

In the survey a standardized data collection form (Annex 3) was used and data collectors were trained over two days to ensure reliability and consistency. A small pilot study was conducted as part of the training.

Data was first collected from Xuhui district, during which the quality of data and associated problems were reviewed. Subsequently data was collected from Zhabei, Putuo and Huangpu districts.

The data collectors were constantly supervised by the survey supervisor who periodically

reported to the investigators. All data was collected by actually visiting the sampling source/site. Prior appointments were taken with the respondents so that data collectors were given adequate time for the collection of data. Some price components were identified from the Center of Drug Price Assessment, State Development and Reform Committee.

Although public procurement prices are determined by the Department of Drug Price Bidding, Municipal of Health Bureau, Shanghai, public health facilities always negotiate directly with pharmaceutical companies in an attempt to obtain lower prices than the government bidding prices. As such, in order to obtain the actual procurement price, we surveyed each of the hospitals (procurement data analysis is based on 18 hospitals). At each public hospital we checked the availability of medicines and recorded the prices charged to patients (public sector patients prices and availability analysis is based on 30 hospitals). The prices and availability in private pharmacies were obtained by surveying the selected pharmacies.

The survey team, including the survey manager, visited the four districts consecutively. The survey team was divided into two groups in each district, with a supervisor allocated to each group. Data collection was completed in six weeks. Throughout the survey, coding was used to identify the public hospitals and private retail pharmacies in order to maintain their anonymity.

### **Measuring affordability**

The affordability of standard treatments was calculated for pre-selected conditions identified in the WHO/HAI manual by comparing the total cost of medicines prescribed at a standard dose, to the daily wage of the lowest paid unskilled government worker (25RMBYuan). The treatment costs were calculated using the price data collected at the facilities.

### **Data collection for component prices**

The manufacturers' ex-factory price is confidential, so it is not available from the government. In order to reveal total mark-ups in the distribution chain, we used the procurement price as a proxy for the manufacturer's selling price. We did not track component costs for individual medicines in the supply chain

In China, no dispensing fee is applied in the public or private sector. The cost of transporting medicines from the manufacturer to wholesalers is included in the procurement price paid by wholesalers. Numerous component costs apply to imported medicines, including duty tax which is generally 4% for imported medicines. A VAT of 17% is charged in retail pharmacies.

### **Data entry**

Following a check of the data collection forms by the supervisor and survey manager, unit prices were entered into the automated workbook provided by WHO/HAI (version 4.02). The principal investigator then checked the data a final time.

### **Data analysis**

### *Median Price Ratios*

In this survey price data is expressed as median price ratios rather than actual prices. The median price ratio (MPR) is the median unit price of the medicine across the facilities surveyed divided by the median international reference price. Data for patient prices in the public and private sector was only included in the analysis where the medicine was found in at least 4 facilities.

### *International Reference Prices*

For both the core and supplementary lists of medicines, the Management Sciences for Health (MSH) Drug Price Indicator Guide 2005 prices were selected as the most useful standard. The MSH reference prices are the medians of recent procurement or tender prices offered predominantly by not-for-profit suppliers to developing countries for multi-source products. When supplier prices were not available, buyer prices were used.

## **Results**

### **Availability of medicines in the public and private sectors**

The data show that the percentage availability of the core and supplementary medicines in both the public and the private sector was generally very low.

#### *Public sector availability*

The availability of both innovator brand and generic medicines across the public facilities surveyed was very low. As shown in Table 5, median availability differs substantially by

product type. Of the 41 medicines for which prices were sought, the median availability of innovator brand products was 13.3%, with a quarter of the innovator brand products not found in any of the outlets. The median availability of generic equivalents was 33.3%, with a quarter of the generic products not found in any of the outlets.

**Table 5 Median percent availability of medicines in public facilities**

	<b>Median availability</b>	<b>25<sup>th</sup> percentile availability</b>	<b>75<sup>th</sup> percentile availability</b>
<b>IB</b>	<b>13.3%</b>	<b>0.0%</b>	<b>40.0%</b>
<b>LPG</b>	<b>33.3%</b>	<b>0.0%</b>	<b>66.7%</b>

Private sector (Retail Pharmacies) availability

The availability of both innovator brand and generic equivalent medicines across the private facilities surveyed was very low. Of the 41 medicines for which prices were sought, the median availability of innovator brand products was 10%, with a quarter of the innovator brand products not found in any of the outlets. The median availability of generic equivalents was 15%; half of the medicines were found in 5% to 55% of outlets (See Table 6).

**Table 6 Median percent availability of medicines in private pharmacies**

	<b>Median availability</b>	<b>25<sup>th</sup> percentile availability</b>	<b>75<sup>th</sup> percentile availability</b>
<b>IB</b>	<b>10.0%</b>	<b>0.0%</b>	<b>60.0%</b>
<b>LPG</b>	<b>15.0%</b>	<b>5.0%</b>	<b>55.0%</b>

Availability of medicines across public and private sectors

Table 7 compares the availability of medicines in the public and private sectors. From the

table, it is clear that the availability of medicines is quite low in both sectors. Generic medicines are more widely available in public facilities than in private facilities. In both sectors, generic medicines are more widely available than innovator brand products.

**Table 7 Median percent availability of medicines across sectors**

	<b>Public facilities (n=30)</b>	<b>Private facilities (n=20)</b>
<b>IB</b>	<b>13.3%</b>	<b>10.0%</b>
<b>LPG</b>	<b>33.3%</b>	<b>15.0%</b>

Table 8 shows the availability of individual core medicines in both sectors. In general, the availability of medicines was quite low in both public and private sectors. Glibenclamide and nevirapine were not available in either sector. In both sectors, generic aciclovir, hydrochlorothiazide and omeprazole were the only medicines available in at least 70% of outlets.

**Table 8 Percent availability of two types of core medicines in both sectors**

<b>Generic name</b>	<b>Product type</b>	<b>Public facilities</b>	<b>Private pharmacies</b>
Aciclovir 200mg	IB	0.0%	0.0%
	LPG	70.0%	75.0%
Amitriptyline 25mg	IB	0.0%	0.0%
	LPG	16.7%	10.0%
Atenolol 50mg	IB	0.0%	0.0%
	LPG	0.0%	10.0%
Beclometasone inhaler 50ug	IB	56.7%	65.0%
	LPG	0.0%	5.0%
Captopril 25mg	IB	0.0%	0.0%
	LPG	20.0%	55.0%
Carbamazepine 200mg	IB	53.3%	60.0%
	LPG	0.0%	0.0%
Ceftriaxone injection 1g	IB	56.7%	5.0%
	LPG	46.7%	20.0%
Diclofenac 25mg	IB	26.7%	95.0%
	LPG	0.0%	0.0%

Fluoxetine 20mg	IB	63.3%	50.0%
	LPG	26.7%	20.0%
Glibenclamide 5mg	IB	0.0%	0.0%
	LPG	0.0%	0.0%
Hydrochlorothiazide 25mg	IB	0.0%	0.0%
	LPG	86.7%	70.0%
Losartan 50mg	IB	76.7%	55.0%
	LPG	0.0%	0.0%
Lovastatin 20mg	IB	0%	0.0%
	LPG	13.3%	10.0%
Metformin 500mg	IB	56.7%	60.0%
	LPG	36.7%	5.0%
Nevirapine 200mg	IB	0.0%	0.0%
	LPG	0.0%	0.0%
Omeprazole 20mg	IB	36.7%	85.0%
	LPG	90.0%	70.0%
Phenytoin 100mg	IB	0.0%	0.0%
	LPG	80.0%	60.0%
Ranitidine 150mg	IB	0.0%	0.0%
	LPG	60.0%	95.0%
Salbutamol inhaler 0.1mg	IB	36.7%	50.0%
	LPG	56.7%	30.0%

## Prices of medicines in the public and private sector

### *Public sector patient prices*

In the public sector, of the 41 medicines surveyed, 21 innovator brand medicines and 29 lowest price generic equivalent medicines were found in four or more public facilities. The median of the median price ratios across the 21 innovator brand products was 5.64, but was quite variable (25<sup>th</sup> and 75<sup>th</sup> percentiles = 2.58, 10.85, respectively). The median of the median price ratios across the 29 lowest price generic equivalents was 2.03, with less variability (25<sup>th</sup> and 75<sup>th</sup> percentiles = 1.2 and 4.19, respectively) (see Table 9).

**Table 9 Summary of median price ratios in the public sector**

	No. of	Median of	25 <sup>th</sup> percentile	75 <sup>th</sup> percentile
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	<b>medicines found in 4+ facilities</b>	<b>median price ratios</b>		
<b>IB</b>	<b>21</b>	<b>5.64</b>	<b>2.58</b>	<b>10.85</b>
<b>LPG</b>	<b>29</b>	<b>2.03</b>	<b>1.20</b>	<b>4.19</b>

Some medicines showed great price variations between the innovator brand and lowest price generic product. For example, the median price ratio of innovator brand ceftriaxone injection was more than 10 times higher than that of the lowest price generic found in the facilities surveyed. The median price ratio of innovator brand omeprazole was more than 4 times higher than that of the lowest price generic product found, while the median price ratio of innovator brand fluoxetine was about 2 times higher than that of the lowest price generic found in the facilities surveyed (see Table 10).

**Table 10 Median price ratios for selected medicines in the public sector**

<b>Generic name</b>		<b>Median price ratio</b>	<b>25<sup>th</sup> percentile</b>	<b>75<sup>th</sup> percentile</b>
<b>Ceftriaxone injection</b>	<b>IB</b>	<b>9.83</b>	<b>9.83</b>	<b>9.83</b>
	<b>LPG</b>	<b>0.88</b>	<b>0.70</b>	<b>0.88</b>
<b>Fluoxetine</b>	<b>IB</b>	<b>69.45</b>	<b>69.45</b>	<b>69.45</b>
	<b>LPG</b>	<b>28.94</b>	<b>28.94</b>	<b>29.04</b>
<b>Metformin</b>	<b>IB</b>	<b>11.85</b>	<b>11.85</b>	<b>11.85</b>
	<b>LPG</b>	<b>2.31</b>	<b>2.31</b>	<b>2.31</b>
<b>Omeprazole</b>	<b>IB</b>	<b>26.46</b>	<b>26.46</b>	<b>27.39</b>
	<b>LPG</b>	<b>6.28</b>	<b>6.28</b>	<b>7.70</b>

<b>Salbutamol inhaler</b>	<b>IB</b>	<b>2.72</b>	<b>2.72</b>	<b>2.77</b>
	<b>LPG</b>	<b>1.73</b>	<b>1.73</b>	<b>1.79</b>

Private sector patient prices

In the private sector, of the 41 medicines in the survey, 17 innovator brand products and 20 lowest price generically equivalent products were found in at least four private sector retail pharmacies. The median of the median price ratio across the 17 innovator brand products was 8.76, but was quite variable (25<sup>th</sup> and 75<sup>th</sup> percentiles = 2.75, 19.53, respectively). On average, the 20 lowest price generic equivalents were much less expensive (median of median price ratios = 1.77) and showed less variability between individual products (25<sup>th</sup> and 75<sup>th</sup> percentiles = 1.27, 4.45, respectively) (See Table 11).

**Table 11 Summary of median price ratios in private pharmacies**

	<b>No. of medicines found in 4+ pharmacies</b>	<b>Median of median price ratios</b>	<b>25<sup>th</sup> percentile</b>	<b>75<sup>th</sup> percentile</b>
<b>IB</b>	<b>17</b>	<b>8.76</b>	<b>2.75</b>	<b>19.53</b>
<b>LPG</b>	<b>20</b>	<b>1.77</b>	<b>1.27</b>	<b>4.45</b>

Some medicines showed substantial price variations between the innovator brand and lowest price generic product. For example, the median price ratio of innovator brand omeprazole was 4.5 times higher than that of the lowest price generic found in the facilities surveyed. The median price ratios of innovator brand clarithromycin and fluoxetine were more than 2 times higher than that of the lowest price generic products

found, while the median price ratio of innovator brand salbutamol was 1.9 times higher than that of the lowest price generic found in the facilities surveyed (see Table 12). Of note are the very high median price ratios for fluoxetine, with innovator brands and lowest priced generics costing 68 and 29 times the international reference price, respectively.

**Table 12 Median price ratios for selected medicines in the private pharmacies**

<b>Generic name</b>		<b>Median price ratio</b>	<b>25<sup>th</sup> percentile</b>	<b>75<sup>th</sup> percentile</b>
<b>Clarithromycin</b>	<b>IB</b>	<b>9.87</b>	<b>9.87</b>	<b>9.87</b>
	<b>LPG</b>	<b>4.29</b>	<b>2.61</b>	<b>4.55</b>
<b>Fluoxetine</b>	<b>IB</b>	<b>68.42</b>	<b>63.00</b>	<b>69.45</b>
	<b>LPG</b>	<b>28.94</b>	<b>28.94</b>	<b>28.94</b>
<b>Omeprazole</b>	<b>IB</b>	<b>26.46</b>	<b>25.29</b>	<b>26.46</b>
	<b>LPG</b>	<b>5.83</b>	<b>5.18</b>	<b>7.70</b>
<b>Salbutamol inhaler</b>	<b>IB</b>	<b>2.75</b>	<b>2.72</b>	<b>2.82</b>
	<b>LPG</b>	<b>1.43</b>	<b>0.86</b>	<b>1.59</b>

*Comparison of prices in the public and private sectors*

In Table 13, only those medicines found in both public and private sector medicine outlets were included in the analysis to allow for the comparison of prices between the two sectors. For the 16 innovator brand medicines found in both sectors, the median price ratios were the same in both public and private facilities. When comparing the 19 lowest priced generic medicines found in both sector, median prices ratios were again very similar through prices in public hospital were about 4% higher than in private pharmacies (see Table 13).

**Table 13 Comparative medicine price ratios in the public and private sectors**

	<b>Public median of median price ratios</b>	<b>Private median of median price ratios</b>	<b>No. of medicines found in both sectors</b>	<b>% difference private sector - public sector</b>
IB	7.2	7.2	16	0%
LPG	2.03	1.95	19	-3.9%

*Procurement prices in the public sector*

The medicines used in public hospitals must be procured through government bulk purchasing. This is one of the measures undertaken to reduce pharmaceutical expenditures. Although public procurement prices are determined by the Department of Drug Price Bidding, Municipal Health Bureau, Shanghai, public health facilities always negotiate with pharmaceutical companies to obtain lower prices than the bidding price. As such, in order to obtain the real procurement price, we surveyed each of the hospitals in the public sector sample.

As shown in Table 14, for the 41 medicines in the survey, 14 innovator brand products and 25 lowest price generic products were found on at least 4 public procurement orders (of a total of 18). The median of the median price ratio across the 14 innovator brand products was 5.48, while the 25<sup>th</sup> and 75<sup>th</sup> percentiles were 1.77 and 8.75, respectively. The median of the median price ratio across the 25 lowest price generic equivalents products was 1.52. For procurement to be assessed as efficient median price ratios should be around 1, i.e. equal to international reference prices. For lowest price generic products, a quarter of the medicines were being procured efficiently, as shown by the 25<sup>th</sup> percentile

MPR of 0.97. However, another quarter of the medicines were being procured at prices which are much higher than international reference prices, as shown by the 75<sup>th</sup> percentile MPR of 3.19. For innovator brands, public hospitals are procuring products which generally cost more than 5 times the international reference price, which is clearly inefficient.

**Table 14 Summary of median price ratios in public procurement sector**

	<b>No. of medicines</b>	<b>Median of median price ratios - hospital negotiated prices</b>	<b>25<sup>th</sup> percentile</b>	<b>75<sup>th</sup> percentile</b>
<b>IB</b>	<b>14</b>	<b>5.48</b>	<b>1.77</b>	<b>8.75</b>
<b>LPG</b>	<b>25</b>	<b>1.52</b>	<b>0.97</b>	<b>3.19</b>

In Table 15, only those medicines for which both the innovator brand and a generically equivalent product were found, were included in the analysis to allow for the comparison of prices between the two product types. Results show that for the 10 medicines found as both product types, public hospitals are paying 4 times more to purchase innovator brands than to purchase lowest price generics.

**Table 15 Comparative medicine price ratios for innovator brands and lowest price generic equivalents in the public procurement sector**

	<b>No. of medicines found as both product types</b>	<b>Median of median price ratios</b>	<b>25<sup>th</sup> percentile</b>	<b>75<sup>th</sup> percentile</b>
<b>IB</b>	<b>10</b>	<b>6.40</b>	<b>2.40</b>	<b>14.51</b>
<b>LPG</b>	<b>10</b>	<b>1.52</b>	<b>0.80</b>	<b>4.15</b>

When hospital procurement prices are compared to government bidding prices for the

same products, the two are found to be very close (Table 16). In fact, it appears that hospitals are paying about 3% more than the government bidding price for generic products.

**Table 16 Comparative medicine price ratios for hospital procurements and government bidding**

	<b>Hospital procurement price median of median price ratios</b>	<b>Government bidding price median of median price ratios</b>	<b>No. of medicines found as both prices</b>	<b>% difference hospitals procurement - bidding price</b>
IB	5.48	5.56	14	-1.4%
LPG	1.52	1.47	25	3.2%

*Comparison of hospital procurement prices and hospital patient prices*

In Table 17, only those medicines with prices found for both public procurement and public patient were included in the analysis to allow for the comparison of prices between the two sectors. For both innovator brand and lowest priced generic medicines, patient prices were just over 30% higher than hospital procurement prices, that is, hospitals are applying a mark-up of about 30%.

**Table 17 Comparative medicine price ratios for procurement prices and patient prices in the public sector**

	<b>Procurement median of median price</b>	<b>Public patient median of median price</b>	<b>No. of medicines found in both</b>	<b>% difference public sector patient prices</b>
--	---	--	---------------------------------------	--

	ratios	ratios	sectors	to procurement
IB	5.48	7.20	14	31.4%
LPG	1.52	2.03	25	33.8%

### Price comparisons across the four survey areas

The median price ratios of the lowest price generic equivalents of selected individual medicines were compared across the four survey areas (see Table 18). In the public sector, the price of ranitidine were the same in all regions. For aciclovir, the price was very similar in the regions where it was found in 4 or more of the facilities sampled. In the private sector, prices across regions were more variable. The price of aciclovir in Zhabei was 80% higher than the price in Putuo, while the price of ranitidine in Zhabei was more than double that in Putuo.

**Table 18 Comparisons of median price ratios across the four survey areas**

	Median price ratio, lowest price generic product			
	Xuhui	Zhabei	Huangpu	Putuo
<b>Public Sector</b>				
Aciclovir 200mg	1.47		1.47	1.36
Ranitidine 150mg	0.87	0.87	0.87	0.87
<b>Private Sector</b>				
Aciclovir 200mg		1.58		0.88
Ranitidine 150mg	0.85	0.96	0.91	0.42

### Affordability

The affordability of standard treatment was measured for 11 conditions. Table 19 shows the affordability of these treatments in the public and private sectors. At the time of the

survey, the monthly salary of the lowest paid unskilled government worker was 750 RMB Yuan, which is 25 RMB Yuan per day.

**Table 19 Affordability of treatments for common medical conditions**

Treatment	Type	Public facilities		Private pharmacies	
		Median price (yuan)	Day's wages	Median price (yuan)	Day's wages
Diabetes:	IB	98.4	3.9	90.90	3.6
Metformin 500mg*2*30days	LPG	19.16	0.8		
Hypertension:	IB				
Hydrochlorothiazide 25mg*1*30 days	LPG	1.17	<0.1	1.17	<0.1
Hypertension:	IB	203.14	8.1	203.14	8.1
Amlodipine 5mg*1*30 days	LPG	117.43	4.7	106.28	4.3
Adult resp infects	IB				
Amoxicilin 500mg*3*7 days	LPG	22.31	0.9	22.31	0.9
Gonorrhoea:	IB				
Ciprofloxacin 250mg*2*1 days	LPG	0.76	<0.1	0.86	<0.1
Arthritis:	IB	59.40	2.4	59.40	2.4
Diclofenac 25mg*2*30 days	LPG				
Depression	IB				
Amitriptyline 25mg*3*30 days	LPG	18.45	0.7		

Depression	IB	360.99	14.4	354.64	14.2
Fluoxetine 20mg *1*30	LPG	155.00	6.0	150.00	6.0
Asthma:	IB	35.30	1.4	35.65	1.4
Salbutamol inhaler 0.1mg/dos*200 dose inhaler	LPG	22.40	0.9	18.55	0.7
Peptic ulcer:	IB				
Ranitidine 150mg*2*30 days	LPG	9.00	0.4	8.80	0.4
Epilepsy:	IB	82.00	3.3	82.00	3.3
Carbamazepine 200mg *2*30 days	LPG				

Table 19 shows the affordability of medicines for various acute and chronic conditions for a government worker earning 25RMB per day. The lowest paid unskilled government worker spends less than a day's wage for the treatment of depression if they buy lowest price generic equivalent amitriptyline from the public sector, while in either sector they would spend 14 and 6 day's wages for innovative brand and lowest price generic fluoxetine, respectively. For a one-month course of metformin to treat diabetes, the lowest-paid government worker would need to spend 3.9 day's wages for the innovator brand and 0.8 for the lowest priced generic, when purchasing the medicine in a public hospital. If the medicine was purchased from a private pharmacy, the worker would have to spend 3.6 days' wages to purchase the innovator brand when no generics are available (generic metformin was only found in 5% of the pharmacies surveyed). For a one month

course of innovator brand amlodipine to treat hypertension, the lowest paid government worker has to spend about 8 days' wages to purchase the medicine either a public hospital or a private pharmacy. If the patient purchases the lowest price generic equivalent amlodipine, the cost is still more than 4 days' wages in both sectors. Conversely, if generic hydrochlorothiazide is purchased for hypertension treatment, the lowest paid government worker would spend less than 0.1 day's wage in both public hospitals and private pharmacies. Indeed, hydrochlorothiazide is the cheapest surveyed drug available for the treatment of hypertension. One month's treatment of peptic ulcer using the lowest price generic equivalent of ranitidine requires 0.4 day's wages in both sectors. The treatment of asthma using innovator brand salbutamol inhaler costs 1.4 days' wages in both sectors; the lowest priced generic costs 0.9 and 0.7 day's wages in public hospitals and private pharmacies, respectively.

### **Price components and mark-ups**

As medicines move from the manufacturer along the supply chain to the patient, various costs are added to the manufacturer's selling price (MSP) of the medicine. The "price components" cover a variety of costs, such as storage and distribution and quality assurance testing, as well as profits.

The manufacturers' ex-factory price is confidential and is therefore not available from the government. We did not track the costs of medicines in the supply chain. However, we did ascertain that in China, no dispensing fee is applied in the public or private sector. The cost of transporting medicines from the manufacturer to wholesalers is included in

the procurement price paid by wholesalers. Numerous component costs apply to imported medicines, including a duty tax which is generally 4%. A VAT of 17% is charged for both local medicines and imported medicines, in pharmacies but not in hospitals.

## **Discussion**

### **Availability in the public and private sectors**

The survey we conducted in Shanghai, China showed that the overall availability of medicines was poor in both the public and private sectors. Generic medicines are more available in public facilities than in private facilities, and within each sector, are more available than innovator brands. In public facilities, the median availability was 13.3% for IBs and 33.3% for LPGs. In private pharmacies, the median availability was 10.0% and 15.0% for IBs and LPGs, respectively.

The reasons for low availability of medicines are summarized as follows:

- The strength of the medicines found in the field sometimes differed from the strengths of core medicines listed in the WHO/HAI survey manual. The strength needed for some medicines in China is generally lower than in western countries. For example, data was collected on captopril 25mg tab, but in the field we noted that for the IB, only the 12.5mg product was used.
- Lack of supply. Most of the medicines surveyed are on the National Drug List. The price of drugs on the NDL is set by the government, and most are quite low. Due to lower profit, pharmaceutical companies do not produce these drugs, or produce lower volumes.

- Irrational use of medicines. This is mainly due to government policy whereby hospitals are able to retain the income from the price difference between the wholesale and retail price of drugs as compensation for low hospital revenue. Because the fee schedules of hospital services are much lower than real costs, hospitals are permitted to earn a profit of 15% for pharmaceuticals and 20% for Chinese herbal preparations. The financial incentives and profit-driven prescribing behaviors of hospitals and physicians lead to irrational use of medicine. It has been reported that in some hospitals, drugs for which prices had been reduced were no longer available; instead, more expensive drugs were prescribed.
- The availability of medicines in private pharmacies was lower than in the public sector. In China, eighty percent of pharmaceuticals are prescribed in hospitals. In order to maintain their overall revenue level, hospitals encourage patients to buy drugs in hospitals rather than in private pharmacies. For example, hospitals use an electronic prescriptions system whereby doctors send the prescription to the hospital pharmacy via computer following a patient visit. As a result, few people go to private pharmacies to buy prescription drugs and over-the-counter (OTC) drugs have become the main goods sold in most private pharmacies.
- A policy of global budget control on pharmaceutical expenditure was adopted in Shanghai in 2004. The purchasing and utilization of high-priced drugs is not allowed beyond 30% of total drug expenditure in tertiary hospitals, 20% in secondary hospitals, and 5% in community hospitals. This can explain the low availability of

innovator brand products as compared with lowest priced generics.

### **Prices in the public and private sectors**

There were some large differences in price between individual innovator brand products and their generic equivalents in both the public and private sectors. Innovator brands were generally more than 2 times the price of the lowest priced generic equivalent products in both sectors. In the public sector, the median price of innovator brand ceftriaxone injection was almost 10 times higher than that of the lowest price generic found in the facilities surveyed. In both public and private sectors, the median price of innovator brand omeprazole was more than 4 times that of the lowest price generic found, while the median price of innovator brand fluoxetine was more than 2 times that of the lowest price generic found. One reason for the high innovator brand premiums observed could be that most of the innovator brand medicines surveyed are imported, therefore competition is limited. Conversely, there are many domestic manufacturers of generic medicines, competition is fierce, and private pharmacies have to lower prices in order to attract customers.

### **Public procurement prices**

The Chinese Ministry of Health initiated the Pharmaceutical Centralized Public Bidding Procurement process in public hospitals in 2000. Public hospitals above county level must be enrolled in the centralized tender. Shanghai is one of the cities where the bulk purchasing policy for drugs is conducted most appropriately in China. In the past 4 years, eighty percent of pharmaceuticals prescribed in hospital have been brought through bulk purchasing. The data shows that for the 41 medicines in the survey, 14 innovator brand

products and 25 lowest price generic products had at least 4 procurement prices. The median price across the 14 innovator brand products found was 5.48 times the international reference price, which is a sign that this procurement system is not obtaining very competitive prices. For ceftriaxone injection, cefradine, metformin and omeprazole the median price ratio for the innovator brand version is many times higher than the lowest price generically equivalent version, which means that the public sector is purchasing higher-priced innovator brands when lower priced generics are available. For generic medicines, one quarter of the 25 products found were being purchased for more than three times the international reference price, indicating inefficiencies in the government's tender and/or individual hospital procurement. Another quarter of the generic medicines found were being purchased for less than the international reference price, possibly as a result of the competitiveness of the generic medicine market in China. Unfortunately these low procurement prices are rarely passed on to patients in the public sector. Overall, patients in the public sector were paying 34% more than the government procurement price for generics, and 31% for innovator brands.

### **The affordability of treatments**

Affordability data indicates that for some treatments, a large proportion of the population will not be able to pay for their medicines. For example, one month's hypertension treatment using innovator brand amlodipine costs the lowest paid unskilled government worker 8 days' wages, and treatment with the cheapest generic costs more than 4 days wages, when purchased from either the public or private sector. Treatment with lisinopril or nifedipine was also not affordable. This is cause for concern in Shanghai, where the prevalence of cardiovascular disorders is on the rise. Treatment with hydrochlorothiazide

was more affordable (less than 1 days' wage for a months treatment) although many local pharmaceutical companies do not like to produce this medicine due to its low price.

Diabetes is also a common disease in Shanghai, and the lowest paid government worker would need to pay nearly 4 days' wages to buy innovator brand metformin in both public and private sectors. While generic metformin is relatively available and affordable (0.8 days' wages) in the public sector, it was rarely found in private pharmacies. For the treatment of depression, the lowest paid government worker would need to spend more than 14 and 6 day's wages for innovative brand and lowest price generic fluoxetine, respectively. Treatment with amitriptyline (lowest priced generic) in the public sector was more affordable but availability was very poor (17%). This medicine was even less available in the private sector (10%). In this survey, affordability has been measured by using the salary of lowest paid government worker. For people earning less than that, affordability is even worse. Therefore, there is need to monitor the situation and to increase the affordability of medicine in both sectors. Lowering the profit margin of hospitals is one way of making medicines more accessible.

### **Price regulation policy and price components**

China has implemented several different drug price policies over last decade, such as fixed mark-ups (5%) for both ex-factory and wholesaler, pricing based on the social average cost, bulk procurement through price bidding, maximum retail prices, market price approach, public hearing, individual drug pricing, etc. In January 2000, China started to administrate pharmaceuticals based on the classifications of prescription drugs and over-the-counter (OTC) drugs. The prices of OTC drugs that are not listed in the

national basic medical insurance drug list are set by the market. The prices of all drugs in the insurance reimbursement list, including OTC drugs, are controlled by the government. The highest retail price is usually set by the State Development and Reform Committee. Provincial Price Bureaus have the right to adjust the price within the range of plus or minus 5%. Pharmaceutical companies report the cost of their off-patent or originator drugs to the State Development and Reform Committee; these are priced separately, beyond the allowed threshold for generic drugs. But the price must gradually be decreased. If the price of an originator brand drug is going to be set separately, one of the prerequisites is that the internal quality standard should be higher than the national standard. Recently, the Ministry of Health has started to use bulk procurement to test the rational price level for different drugs. As soon as a drug's price is determined by the bidding system, the State Development and Reform Committee will announce its maximum retail price to the public.

## **Conclusions**

1. Low availability of both branded drugs and generic alternatives was seen in private pharmacies. This may indicate that private pharmacies widely dispense OTC drugs.
2. In the public sector availability was low, even for the medicines on the national essential drug list.
3. Public hospitals had greater availability of generics compared to innovator brand.
4. The prices of innovator brands are considerably higher than those of their generic equivalents.
5. The median price of some medicines surveyed is lower in private pharmacies than in the public sector, for both the innovator brand and the lowest price generic equivalent.

The prices of some medicines are identical for both the innovator brand and the lowest price generic equivalent, in both sectors.

6. Low affordability was observed for some common ailments, in particular non-communicable diseases such as hypertension, diabetes, etc.

## **Recommendations**

1. There is a need for a rational drug pricing policy, and for that policy to be incorporated into the national drug policy. The national government must implement an Essential Medicines Policy to reduce the number of medicines available in the country, and to reduce the available preparations to a manageable number which can be effectively supplied, monitored and controlled.
2. Government should reform the remuneration mechanism to hospitals and physicians in the context of improving access to medicines.
3. Emphasis should be placed on generic prescription. The prescribers and dispensers, as well as consumers awareness needs to be increased in this respect so that low priced generics are more widely accepted and used.
4. Government counts the essential medicine into the basic healthcare service package. With prescription, patients can have access to any kind of essential medicine from health care facilities and retail drug stores after paying for prescription fee. However, it's free for those poor, old, children and social vulnerable population.
5. In order to avoid a conflict of interest for doctors, prescribing and dispensing should be separated. Authorities should minimize the irrational use of drugs and the prescription of costly products when less expensive drugs of equal efficacy are available. It is necessary to establish a fair, competitive platform between private

pharmacies and public hospitals so that consumers can get drugs either in pharmacies or in hospitals. This measure is needed to improve access to medicines and make them more affordable.

6. Regulate prices of innovator products. The government should regulate the manufacturer's selling price and fix the mark-up in distribution chain for innovator brand products, as these are main contributors to the retail price.
7. The Department of Drug Pricing, National Development and Reform of Commission should launch an investigation into the production costs and actual retail prices of drugs and then move to finalize the price reduction plan.

## **References**

1. World Health Organization and Health Action International. Medicine prices: a new approach to measurement. Working draft for field testing and revision. 2003 edition.
2. SL Hu. Pharmaceutical Cost-containment Policy: Experiences in Shanghai, China. *Health Policy and Planning*; 2001, 16(Suppl 2):4-9.
3. Qinyue Meng. The impact of china's retail drug price control policy on hospital expenditures. Oxford university press in association with the London School of Hygiene and Tropical Medicine. 2005:185-196.
4. The State Development and Reform Committee. Drug pricing policy collection. Apr. 2006.
5. Sun Qiang. A Survey of Medicine Prices, Availability, Affordability and Price Components in Shandong Province, China. Oct. 2005.

## Annex 1 List of medicines surveyed

Med. No.	Medicine Name (Name must be unique)	Medicine Strength	Dosage Form	Target Pack Size	Core List (yes/no)
1	Aciclovir	200 mg	cap/tab	25	yes
2	Albendazole	200mg	cap/tab	10	no
3	Alendronate	10mg	cap/tab	7	no
4	Amitriptyline	25 mg	cap/tab	100	yes
5	Amlodipine	5mg	cap/tab	7	no
6	Amoxicillin	500 mg	cap/tab	21	no
7	Anastrozole	1mg	cap/tab	14	no
8	Atenolol	50 mg	cap/tab	60	yes
9	Azathioprine	50mg	cap/tab	100	no
10	Beclometasone inhaler	0.05 mg/dose	dose	200	yes
11	Captopril	25 mg	cap/tab	60	yes
12	Carbamazepine	200 mg	cap/tab	150	yes
13	Cefuroxime	250mg	cap/tab	12	no
14	Cefradine injection	500mg/vial	vial	1	no
15	Ceftazidime injection	1g/vial	vial	1	no
16	Ceftriaxone injection	1g/vial	vial	1	yes
17	Cimetidine	400mg	cap/tab	100	no
18	Ciprofloxacin	250 mg	cap/tab	100	no
19	Clarithromycin	250mg	cap/tab	100	no
20	Diclofenac	25 mg	cap/tab	100	yes
21	Digoxin	0.25mg	cap/tab	100	no
22	Fluconazole	150mg	cap/tab	30	no
23	Fluoxetine	20 mg	cap/tab	30	yes
24	Glibenclamide	5 mg	cap/tab	60	yes
25	Gliclazide	80mg	cap/tab	60	no
26	Hydrochlorothiazide	25 mg	cap/tab	30	yes
27	Ketoconazole	200mg	cap/tab	10	no
28	Lisinopril	10mg	cap/tab	14	no
29	Loratadine	10mg	cap/tab	6	no
30	Losartan	50 mg	cap/tab	30	yes
31	Lovastatin	20 mg	cap/tab	60	yes
32	Metformin	500 mg	cap/tab	100	yes
33	Nevirapine	200 mg	cap/tab	60	yes
34	Nifedipine	30 mg	cap/tab	100	no
35	Omeprazole	20 mg	cap/tab	30	yes
36	Phenytoin	100 mg	cap/tab	100	yes
37	Ranitidine	150 mg	cap/tab	60	yes
38	Rifampicin	150mg	cap/tab	100	no
39	Salbutamol inhaler	0.1 mg/dose	dose	200	yes
40	Simvastatin	20mg	cap/tab	7	no
41	Sodium Chloride 0.9% IV soln	500ml	millilitre	500	no

## **Annex 2**

### **National Pharmaceutical Sector form**

Date: Nov.8

Population: 1.31 billion in China 2006

Daily wage of lowest paid government worker      25yuan

Rate of exchange (commercial “buy” rate) to US dollars on the  
first day of data collection:7.999

Sources of information:

## General information on the pharmaceutical sector

Is there a formal National Medicines Policy document covering both the public and private sectors? Yes

Is an Essential Medicines List (EML) available? Yes

If yes, state total number of medicines on national EML: 2033

If yes, year of last revision: Year 2004

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

National

Regional

Public sector only

Both public and private sectors

Other (please specify):

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

For registration of medicines nationally

Public sector procurement only

Insurance and/or reimbursement schemes

Private sector

Public sector

Is there a policy for generic prescribing or substitution? No

Are there incentives for generic prescribing or substitution? No

## Public procurement<sup>1</sup>

Is procurement in the public sector limited to a selection of essential medicines? Yes

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

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

International, competitive tender

Open

Closed (restricted)

National, competitive tender

Open

Closed (restricted)

Negotiation/direct purchasing

---

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

Are the products purchased all registered? Yes  
 Is there a local preference?<sup>2</sup> Yes  
 Are there public health programmes fully implemented by donor assistance which also provide medicines? Yes  
 (e.g. TB, family planning, etc.)

If yes, please specify: For TB World Bank Loan Project(Health VIII) , which provides the anti-TB drugs. Now the project is almost running out of the time.

### Distribution<sup>3</sup>

Is there a public sector distribution centre/warehouse? Yes

If yes, specify levels: Regional level

Are there private not-for-profit distribution centres: No  
 e.g. missions/nongovernmental organizations?

If yes, please specify:

Number of licensed wholesalers:

### Retail

	Urban	Rural	Overall
Number of inhabitants per pharmacy (approx.)	NA	NA	6500
Number of inhabitants per qualified pharmacist (approx.)	NA	NA	6667
Number of pharmacies with qualified pharmacists	NA	NA	21000
Number of medicine outlets with pharmacy technician	NA	NA	NA
Number of other licensed medicine outlets	NA	NA	NA

### Private sector<sup>4</sup>

Are there independent pharmacies? Yes Number:130000

Are there chain pharmacies? Yes Number:91000

Do doctors dispense medicines?<sup>5</sup> No

If yes, approximate coverage or % of doctors who dispense:

Are there pharmacies or medicine outlets in health facilities? Yes

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

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

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

<sup>5</sup> Many countries allow doctors to dispense and sell medicines.

## Financing

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

Type of expenditure	Approximate annual budget (US dollars)
National public expenditure on medicines including government insurance, military, local purchases in past year	NA
Estimated total private medicine expenditure in past year (out of pocket, private insurance, NGO/mission)	41.6 bilions
Total value of international medicine aid or donations in past year	NA
What percentage of medicines by value are imported? %	

## Government price policy

Is there a medicines regulatory authority? Yes	
Is pricing regulated? Yes	
Is setting prices part of market authorization/registration?	Yes
Do registration fees differ between:	
■ Innovator brand and generic equivalents	Yes
■ Imported and locally produced medicines	Yes

## Public sector

Are there margins (mark-ups) in the distribution chain? No

- Central medical stores %
- Regional store %
- Other store (specify) %
- Public medicine outlet %

Are there any other fees or levies? No

If yes, please describe:

## Private retail sector

Are there maximum profit margins? Yes

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

- Wholesale 15%
- Retail %

Is there a maximum retail price (sales price)? Yes

(If it varies, give maximum and minimum)

- Maximum:
- Minimum:

Do patients pay professional fees (e.g. dispensing fee)? No

If yes, please describe:

**“Other” sector**

Are there maximum profit margins? No

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

- Wholesale %
- Retail %

Is there a maximum sales price? Yes

**Insurance, risk-sharing or prepayment schemes**

Are there any health insurance, risk-sharing or prepayment schemes or revolving medicine funds? Yes

If yes, please describe: The Urban Employee Basic Health Insurance Scheme

Are all medicines covered? No

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

Only the drugs in the EML are covered by the Scheme

Are some patients / groups of patients exempted, regardless of insurance coverage? (e.g. children < X yrs, war veterans) Yes

If yes, please specify:

According to the regulation of the Urban Employee Basic Health Insurance Scheme, All urban employees in public and private enterprises, civil servants and the retired employees are compulsorily enrolled. Self-employed and rural industrial workers are not required to enroll. The dependants, including their children are now excluded.

Estimated percentage of population covered 19%

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

If no, are some free? Yes

If yes, tick all that apply:

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

Are there official user charges/patient co-payments/fees? Yes  
Are all medicines supplied free at hospitals? No  
If no, are some free? No  
If yes, please specify:

## **Medicine Price Data Collection form**

**Use one form for each health facility and pharmacy**

Date: Area number:

Name of town/village/district:

Name of health facility/pharmacy (optional):

Health facility/pharmacy ID (mandatory):

Distance in km from nearest town (population >50 000):

Type of health facility:

Public       Private retail pharmacy

Other (please specify):

Type of price in public and private not-for-profit sector:

Procurement price     Price the patient pays

Name of manager of the facility:

Name of person(s) who provided information on medicine prices and availability (if different):

Data collectors:

## **Verification**

To be completed by the area supervisor at the end of the day

Signed:

Date:

### Annex 3: MEDICINE PRICE DATA COLLECTION FORM

A	B	C	D	E	F	G	H	I	
Generic name, dosage form, strength	Brand name(s)	manufacturer	Available tick for ✓ yes	Pack size rec'd	Pack size found	Procumbent price	Retail price	Unit price	备注
Aciclovir <b>tab 200 mg</b>	Zovirax	GSK		25				/tab	
<i>Lowest price generic equivalent</i>				25				/tab	
Albendazole <b>200mg tab</b>	Zentel	Smithkline		10				/tab	
<i>Lowest price generic equivalent</i>				10				/tab	
Alendronate <b>tab 10mg</b>	Fosamax	MSD		7				/tab	
<i>Lowest price generic equivalent</i>				7				/tab	
Amitriptyline <b>tab 25 mg</b>	Tryptizol	MSD		100				/tab	
<i>Lowest price generic equivalent</i>				100				/tab	
Amlodipine <b>caps 5 mg</b>	Norvasc	Pfizer		7				tab /cap	
<i>Lowest price generic equivalent</i>				7				tab /cap	
Amoxicillin <b>caps/tab500 mg</b>	Amoxil	Squibb		21				/tab	
<i>Lowest price generic equivalent</i>				21				/tab	
Anastrozole <b>1mg tab</b>	Arimidex	Zeneca		14				/tab	
<i>Lowest price generic equivalent</i>				14				/tab	
Atenolol <b>tab 50 mg</b>	Tenormin	Astrazeneca		60				/tab	
<i>Lowest price generic equivalent</i>				60				/tab	
A	B	C	D	E	F	G	H	I	
Generic name, dosage form, strength	Brand name(s)	manufacturer	Available tick for ✓ yes	Pack size rec'd	Pack size found	Procumbent price	Retail price	Unit price	备注
Azathioprine <b>50mg tab</b>	imuran	GSK		100					

<i>Lowest price generic equivalent</i>				100				/tab	
<b>Beclometasone inhaler 50 mcg/dose</b>	Becotide	GSK		1 inhaler: 200 doses				/dose	
<i>Lowest price generic equivalent</i>				1 inhaler: 200 doses				/dose	
<b>Captopril tab 25 mg</b>	Capoten	GSK		60				/	
<i>Lowest price generic equivalent</i>				60				/tab	
<b>Carbamazepine tab 200 mg</b>	Tegretol	Novartis		100				/tab	
<i>Lowest price generic equivalent</i>				100				/tab	
<b>Cefiroxime 250mg tab</b>	Zinnat	GSK		12				/tab	
<i>Lowest price generic equivalent</i>								/tab	
<b>Cefradine inj 500 mg</b>	Velosef	B-M Squibb		1				/	
<i>Lowest price generic equivalent</i>				1				/	
								vial	

A	B	C	D	E	F	G	H	I	
Generic name, dosage form, strength	Brand name(s)	manufacturer	Available tick for ✓ yes	Pack size rec'd	Pack size found	Procumbent price	Retail price	Unit price	备注
<i>Ceftazidime inj 1G</i>	Fortum	GSK		1 vial				/ vial	
<i>Lowest price generic equivalent</i>									
<b>Ceftriaxone inj 1 g powder</b>	Rocephin	Roche		1 vial				/vial	
<i>Lowest price generic equivalent</i>				1 vial				/vial	
<b>Cimetidine tab 0.4G</b>	Tagamet	Smithkline		100				/tab	
<i>Lowest price generic equivalent</i>				100					
<b>Ciprofloxacin 250mg tab</b>	Ciproxin	Bayer		100				/ tab	
<i>Lowest price generic equivalent</i>				100				/ tab	
<b>Clarithromycin tab250mg</b>	Klacid	Abbott		100				/tab	
<i>Lowest price generic equivalent</i>				100				/tab	

A	B	C	D	E	F	G	H	I	
Generic name, dosage form, strength	Brand name(s)	manufacturer	Available tick for ✓ yes	Pack size for recommended	Pack size found	Procumbent price	Retail price	Unit price	备注
Diclofenac <b>tab 25 mg</b>	Voltarol	Novartis		100				/tab	
<i>Lowest price generic equivalent</i>				100				/tab	
Digoxin <b>tab 0.25mg</b>				100				/tab	
<i>Lowest price generic equivalent</i>				100				/tab	
Fluconazole <b>caps/tab 150 mg</b>	Diflucan	Pfizer		30				/tab	
<i>Lowest price generic equivalent</i>				30				/tab	
Fluoxetine <b>caps/tab 20 mg</b>	Prozac	Eli Lilly		30				/tab	
<i>Lowest price generic equivalent</i>				30				/tab	
Glibenclamide <b>5mg tab</b>	Daonil	HMR		60				/tab	
<i>Lowest price generic equivalent</i>				60				/tab	
Gliclazide <b>tab 80mg</b>	Diamicon	Les Laboratories Servier		60				/tab	
<i>Lowest price generic equivalent</i>				60				/tab	
Hydrochlorothiazide <b>tab 25 mg</b>	Dichlotride	MSD		30				/tab	
<i>Lowest price generic equivalent</i>				30				/tab	
Ketoconazole <b>200mgtab</b>	Nizoral	Janssen		10				/tab	
<i>Lowest price generic equivalent</i>				10				/tab	
A	B	C	D	E	F	G	H	I	
Generic name, dosage form, strength	Brand name(s)	manufacturer	Available tick for ✓ yes	Pack size rec'd	Pack size found	Procumbent price	Retail price	Unit price	备注

Lisinopril <b>tabs 10mg</b>	Zestril	Astrazeneca		14					/tab
<i>Lowest price generic equivalent</i>				14					/tab
Loratadine <b>10mg tab</b>	Clarityne	Schering Plough		6					/tab
<i>Lowest price generic equivalent</i>				6					/tab
Losartan <b>tab 50 mg</b>	Cozaar	MSD		30					/tab
<i>Lowest price generic equivalent</i>				30					/tab
Lovastatin <b>tab 20 mg</b>	Mevacor	MSD		60					/tab
<i>Lowest price generic equivalent</i>				60					/tab
Metformin <b>tab 500 mg</b>	Glucophage	Squibb		100					/tab
<i>Lowest price generic equivalent</i>				100					/tab
Nevirapine <b>200mg tab</b>	Viramune	Boehringer Ingelheim		60					/tab
<i>Lowest price generic equivalent</i>				60					/tab
Nifedipine <b>30mg tab</b>	Adalat	Bayer		7					/tab
<i>Lowest price generic equivalent</i>				7					/tab

A	B	C	D	E	F	G	H	I	
Generic name, dosage form, strength	Brand name(s)	manufacturer	Available tick for ✓ yes	Pack size rec'd	Pack size found	Procumbent price	Retail price	Unit price	备注
Omeprazole caps 20 mg	Losec	Astrazeneca		30				/caps	
<i>Lowest price generic equivalent</i>				30				/caps	
Phenytoin caps/tab 100 mg	Epanutin	Pfizer		100				/tab	
<i>Lowest price generic equivalent</i>				100				/tab	
Ranitidine tab 150 mg	Zantac	GSK		60				/tab	
<i>Lowest price generic equivalent</i>				60				/tab	
Rifampicin 150mg tab				100				/tab	
<i>Lowest price generic equivalent</i>				100				/tab	
Salbutamol inhaler 0.1 mg per dose	Ventoline	GSK		1 inhaler: 200 doses				/dose	
<i>Lowest price generic equivalent</i>				1 inhaler: 200 doses				/dose	
Simvastatin tab 20mg	Zocor	MSD		7				/tab	
<i>Lowest price generic equivalent</i>				7				/tab	
Sodium Chloride 0.9% 500ml IV solution								/millilitre	
<i>Lowest price generic equivalent</i>				500ml				/millilitre	