Estimated Financing Amount Needed for Essential Medicines in China, 2014

Wei Xu1, Zheng-Yuan Xu1, Gong-Jie Cai1, Chiao-Yun Kuo2,3, Jing Li1, Yi-Syuan Huang2
1School of International Pharmaceutical Business, China Pharmaceutical University, Nanjing, Jiangsu 211198, China
2International Center for Regulatory Science, School of Pharmacy, University of Southern California, Los Angeles, CA 90089, USA
3Titus Family Department of Clinical Pharmacy and Pharmaceutical Economics and Policy, School of Pharmacy, University of Southern California, Los Angeles, CA 90089, USA

Abstract

Background: At the present time, the government is considering to establish the independent financing system for essential medicines (EMs). However, it is still in the exploration phase. The objectives of this study were to calculate and estimate financing amount of EMs in China in 2014 and to provide data evidence for establishing financing mechanism of EMs.

Methods: Two approaches were adopted in this study. First, we used a retrospective research to estimate the cost of EMs in China in 2014. We identified all the 520 drugs listed in the latest national EMs list (2012) and calculated the total sales amount of these drugs in 2014. The other approach included the steps that first selecting the 109 most common diseases in China, then identifying the EMs used to treat them, and finally estimating the total cost of these drugs.

Results: The results of the two methods, which showed the estimated financing amounts of EMs in China in 2014, were 17,776.44 million USD and 19,094.09 million USD, respectively.

Conclusions: Comparing these two results, we concluded that the annual budget needed to provide for the EMs in China would be about 20 billion USD. Our study also indicated that the irrational drug use continued to plague the health system with intravenous fluids and antibiotics being the typical examples, as observed in other studies.

Key words: China; Essential Medicines; Financing Amount; Financing Mechanism; Irrational Drug Use

Introduction

The concept of essential medicine (EM) was launched in 1977 by the World Health Organization (WHO) along with the publication of its first model list of essential medicines (EMs), as a reference for national and institutional EM lists. The selected EMs are public health relevant, safe, and comparatively cost-effective. The EM system has been known as a powerful tool to promote health equity. WHO stressed that equitable access to quality medicines was essential to strengthen the health system and reform primary health care, particularly in lower middle-, and low-income countries. Four components of availability of EMs are rational selection, affordable prices, sustainable financing, and reliable health system and supply system, which means that sustainable and efficient financing of EMs is the building block for EM policy. In China, the national EM policy was implemented on August 2009, as a part of health care reform. The policy aimed at canceling the 15% profit gap between prices of wholesale and retail with a systematic plan to achieve universal health care by 2020. From 2009 to 2011, a series of policies of national EM have been established, such as the EM list, organizing production, quality assurance, and pricing. However, comprehensive EM policies are still needed, covering many different aspects, such as appropriate research and development, financing mechanisms including various measures to assure quality assurance, supply systems, and safe and cost-effective

Address for correspondence: Gong-Jie Cai, School of International Pharmaceutical Business, China Pharmaceutical University, Nanjing, Jiangsu 211198, China E-Mail: caigongjie0524@126.com

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use.\[6] Compared with the WHO’s EM framework, the financing mechanism of EMs in China is still in the stage of development. The objective of this paper was to calculate and estimate total costs of EMs in China in 2014, which was the answer to how much money will the EMs need.

Many scholars have endeavored to estimate the financing amount of EMs in China. Professor Lu Ye from Fudan University (2008), selected hypertension, diabetes, microbial infection, and mental illnesses as disease samples and replaced the medicines treating them with EMs having the same generic name listed in WHO model list of EMs (2005 edition) in the research. Finally, the cost of 312 selected EMs from WHO model list of EMs (2005 edition) was calculated at 12.569 billion USD.\[7] The Municipal Health Bureau of Weifang in Shandong Province conducted a study on the national basic health service package. The authors selected 83 emergents, acute or chronic diseases and identified 121 EMs related to these diseases. The total cost of national EMs was calculated at about 16.623 billion USD in 2007.\[8]

Improving the EM policies is vital for medical health in China’s 13th Five-Year Plan (2016–2020), and the government is considering to establish the independent financing system for EMs at the same time. However, there is no perfect financing mechanism and updated data of estimated cost of EMs in China since 2007. In the present study, we provided improved methods to estimate the financing amount of EMs from two perspectives: the estimated cost of actual use and meeting the demand for treatment. The latter approach measured the theoretical cost of EMs by identifying varieties, quantities, and prices of EMs used in common diseases. With these two methods, the present study may provide data references for China to establish an independent financing mechanism of EMs.

Methods

Study overview

We demonstrated two approaches to estimate the financing amount of EMs in China. In the first approach, we collected the sales amounts of EMs in China in 2014. However, there are hurdles for calculation of actual financing amounts of EMs. One of the reason is that the actual sales cannot represent the financing amount due to the differences between the actual use and rational use of the drug. For instance, the physicians are incentive to prescribe high-margin drugs instead of low-margin ones, while the majority of low-margin drugs were EMs. On the other hand, overuse of certain EMs may be led since the reimbursement of essential drugs was significantly higher than that of nonessential drugs. In terms of financing and payment, the government prefers to use less money to promote the rational use of the drug when designing the EMs system so that we can calculate the theoretical financing amount of EMs based on the most basic demand for treatment of common diseases. Therefore, our second approach was to estimate the financing amount of EMs considering Chinese residents’ demand for treatment of common diseases.

Meanwhile, we expected that the results can reflect the potential demand scale of EMs.

Calculation based on actual use of essential medicines

It was difficult to obtain data only of EMs in current medical insurance system in China because all of the funds of EMs were mixed with other medical costs. At present, an independent financing mechanism of EMs has not been built in China. Meanwhile, as the absence of financing mechanism of non-EMs and terminal access network at the national level, it is difficult to separate the consumption data of essential from non-EMs. Therefore, in order to obtain the actual use of EMs in China, the first step we did was to obtain the actual sales data in 2014 in four sample cities. Second, the study replaced the percentage of sales amount of EMs of a sample city accounting for the total health expenditure with the percentage of the total health expenditure of the same sample city accounting for that of the whole nation, and in the final step, we got the sales of EMs of the whole country by the proportion. Through analyzing the sales data of 520 drugs, we could obtain the total sales amount of the EMs. We neglected those EMs being transported or stored in hospitals and pharmacies and regarded the sales condition of EMs as the actual use. The statistic formulas could be written as:

\[
A_i = \frac{E_i \times T_i}{4 \sum W_i} 
\]

\[
B = \sum_1^n (A_i \times U_i) 
\]

\[
C = \frac{B}{V} 
\]

\[
Q = \frac{1}{4 \sum W} \times C 
\]

\(A_i\) represents the total sales amount of certain generic EMs in 2014. \(E_i\) represents the total sales amount of the certain generic drug in 2014. \(T_i\) represents the percentage that the sales amount of certain EM accounts for that of the same generic medicine. \(B\) represents the total sales amount of certain EM in a sample city in 2014. \(U_i\) represents the percentage of sales amounts of certain generic medicine of four sample cities (Beijing, Chongqing, Guangzhou, and Nanjing). \(n\) represents the number of EMs in national EMs list (NEML). \(C\) represents total sales amount of EMs in certain province in 2014. \(V\) represents the percentage of total health expenditure of certain city accounting for that of the corresponding province (the value of \(V\) is 1 when it comes to Beijing and Chongqing) in 2014. \(W_i\) represents the percentage of total health expenditure of certain province accounting for that of the nation in 2014, and \(Q\) was the national total sales amount of EMs in 2014.

The calculation processes are illustrated in Figure 1 and explained in detail as follows: Step 1: The 520 medicines were identified according to the latest (NEML, 2012); Step 2: The sample cities were determined. The “Terminal Sales
Statistical Database (TSSD) of 2012” on Chinese medicine economic information website contained data for chemical drugs in 16 cities and proprietary Chinese medicines in nine cities. Only four cities’ health expenditures were available in the public database. Hence, we selected these four cities: Beijing, Chongqing, Guangzhou, and Nanjing as sample cities in this study and took advantage of all available data. Beijing and Chongqing are municipalities governed directly by the central government; Guangzhou and Nanjing governed by Guangdong and Jiangsu, respectively, are capital cities; Step 3: The sales amounts of EMs were calculated. For the sales amount of certain generic EM, we employed the “TSSD of 2012” in the MENET, a website which is launched by the Southern Medicine Economic Research Institute subordinated to China Food and Drug Administration, and its official website is www.menet.com.cn. Since the NEML provided many kinds of specific dosage forms and specifications for each generic EM, we needed to get the percentage that the sales amount of EMs accounts for that of all the same generic drugs, which can be calculated after searching TSSD and medicine index database. Then, we obtained the sales amount of an EM by multiplying the percentage and the sales amount of corresponding generic drug in TSSD; Step 4: Total sales amount of EMs in every sample city was calculated. Search for the percentage that sales amount of each generic EM of every sample city accounts for that of cities in TSSD, and then multiply the sales amount of EMs (in Step 3) and the percentage to obtain the sales amount of each generic EM in every sample city. Finally, we sum up all the sales amount of each generic EM to obtain the total sales amount of all generic EM in each sample city; Step 5: The four estimated total costs of EMs in China were based on the sales amounts in four sample cities. The health expenditures of cities were obtained from the China Public Health Statistical Yearbook, the Jiangsu Province Public Health Statistical Yearbook, and the Guangdong Province Public Health Statistical Yearbook, and their proportions to the total health expenditure in China were calculated. The individual proportion, along with the corresponding sales amount of EMs in four sample cities, were employed to estimate the total cost of EMs in China. Through these steps, four independent estimates were obtained.

The average of the four estimates was our estimated financing amount of EMs in China in 2014.

Calculation based on future demand for essential medicines

The second approach to estimate the financing amount of EMs was based on future demand for EMs. First, we screened out the common and prevalent diseases. Second, we determined the EMs that used in treatment of each disease and found their usage amounts. Finally, the cost of each EM was calculated in accordance with the bidding price. The model is shown as below:

![Diagram](image_url)
Define $S$ as the financing amount of EMs, $n$ as the number of selected common diseases, $X_i$ as the cost of EM for certain common disease, $Y_i$ as an average cost of EMs if the disease has at least two prescriptions, $Z_i$ as the number of specific patients group of certain common disease, $P_i$ as the cost of EM from a single prescription for certain common disease, $m$ as the number of prescriptions that contain EMs for certain disease, $R_i$ as morbidity of certain common disease, and $Q_i$ as the population base of certain common disease.

The calculation processes are shown in Figure 2, and the detailed steps are described as follows: Step 1: Selection of common diseases. WHO defined EMs as those drugs that satisfied the health care needs of the majority of the population. Referring to it, we screened out the common diseases with high incidence in China on the purpose of meeting the basic medical needs in terms of the disease incidence. We selected diseases that covered over 95% patients who have their treatment in primary health care facilities during the latest 3 years and infectious diseases from Chinese Health Statistics Yearbook 2014. Then, we supplemented several diseases with high incidence by searching through authoritative medical and pharmaceutical repositories, and eventually we nailed down 109 kinds of diseases as common diseases which covered all the common diseases and every hospital department and complied with the relevant requirements of the WHO EMs. The common diseases consist of 44 internal medical diseases, 18 surgical diseases, 18 infectious diseases, nine obstetric and gynecological diseases, six ear, nose, and throat diseases, five pediatric diseases, three skin and sexually transmitted diseases, two neoplastic diseases, two mental diseases, and two diseases from the emergency department.  

Step 2: Referring to the NEML 2012 and authoritative prescription guidelines and formularies, we screened out prescriptions that contained EMs. The prescription guidelines included *Prescription Handbook of Common Diseases, The Formulary of Common Drugs in Various Clinical Departments, Prescription Handbook for General Practitioners*, and *The Innovative Usages of Proprietary Chinese Medicines for Common Diseases*. Then, we screened out those prescriptions that contained EMs which were listed in NEML for each defined common disease and recorded the formulary, dosage form, specification, and treatment period of each EM.

Step 3: Calculation of the total EMs dosage in one treatment period. We had selected all prescriptions that contained EMs for 109 common diseases, and then we clearly recorded daily dosage and treatment period for every EM in step 2. We assumed that physicians strictly followed prescription guidelines and formularies when they prescribed. Each disease has a specific treatment period. For example, medicines for emergent diseases are prescribed for a single dosage or 1-day dosage. Some of the common chronic diseases need lifelong treatments, and the patients have to take medications daily. Thus, we adopted 365 days as their treatment period. As for injections, the
treatment periods are generally no more than 7 days. It is worth noting that some diseases are sorted strictly by different levels and have flexible treatment periods in a fixed interval. In our study, we assumed that EMs satisfied the most basic medical needs and took the minimum value as treatment period. Then, the total EM dosage in one treatment period was equal to the daily dosage multiplying by the treatment period. Generally, EM dosage is expressed as measurement unit such as milligram (mg) in the prescription guidelines and formulations, while physicians prescribe medications as minimum package unit such as bottle or box. Hence, we needed to convert measurement unit into minimum package unit to get the dosage in one treatment period so that we could match the dosage with the retail price in Step 4 at the same unit. For an oral drug such as tablets, capsules, granules, the quantity of package (minimum package unit) could be obtained by making total dosage (measurement unit) divided by dosage of the minimum package unit. Step 4: Calculation of the total cost of EMs in one treatment period. Since the EMs are zero-profit drugs, the bidding price is equal to the retail price. As the specifications of the same generic were various in different provinces, we first needed to convert the bidding price into the price of the minimum package unit, and then to take the average value of the minimum package unit in ten provinces as the final retail price that we used in the calculation. The ten provinces were Gansu, Anhui, Shanghai, Shanxi, Shandong, Qinghai, Jilin, Hubei, Heilongjiang, and Ningxia. After that, the total cost of EMs in one treatment period was obtained by multiplying the total EMs dosage (showed in Step 3) and the price of the minimum package unit. If there were various prescriptions for the same disease, we calculated the cost of the EMs of all prescriptions and took the average value as the final cost for one treatment period. Step 5: Calculation of the total cost of rational use of EMs. Since the age, gender, and health status differs in specific patient groups, for example, prostatitis for male, mammary cancer for female, infantile diarrhea for children, senile cataract for the elderly, and ectopic pregnancy for the pregnant female, we firstly calculated the quantities of specific patient groups for every disease according to morbidity and population. Then, we multiplied the value and the cost of EMs showed in Step 4. Eventually, we summed up the cost of all the EMs for each disease and obtained the total cost as well as financing amount of EMs for all selected diseases.

### Results

**Data based on actual use of essential medicines**

The estimated sales amounts of EMs among the four sample cities are shown in Table 1. Among them, Beijing had the highest estimated sales amount of EMs of 756.42 million USD; Guangzhou, Chongqing, and Nanjing followed with 394.41 million, 202.74 million, and 202.33 million USD, respectively. The projected total cost of EMs at the state level was calculated on the basis of the proportion of health expenditure of each city to its province and the proportion of the province to the nation. For example, health expenditure of Nanjing city was 15.44% of that of Jiangsu province, therefore, the calculated sales amount of Jiangsu province was to be 1310.43 million USD. Furthermore, since the health expenditure of Jiangsu province occupied 6.17% of national health expenditure, the projected total cost of EMs in China would be 21,238.74 million USD. In the same way, based on our estimation of Beijing, Chongqing, and Guangdong, the projected total cost of EMs in China would be 18,585.26, 9342.86, and 21,938.89 million USD, respectively. The average of these four projected numbers which would be 17,776.44 million USD was interpreted as the financing amount of EMs for the whole nation in 2014.

**To meet demand for essential medicines**

To meet the demand for EMs to treat common diseases, we calculated the cost of EMs treating each common disease, which is presented in Supplementary Table 1. The total theoretical financing amount of EMs was 30,599.50 million USD. It was observed that the financing amount of the top 10 diseases in terms of the theoretical financing amount accounted for 84.47% of the total while the remaining 99 diseases only accounted for 15.53%. The top 10 diseases are primary hypertension, chronic gastritis, acute pharyngitis diabetes, chronic cholecystitis, cholelithiasis, myocardial infarction, dysmenorrhea, urolithiasis, infantile diarrhea, and hemorrhoids. The financing amount of the chronic diseases with higher incidence and long-term treatment periods, such as hypertension, diabetes, chronic gastritis, are the main part of total theoretical financing amount.

**The top 10 chemical and biological essential medicines sold in China in 2014**

The top 10 chemical and biological EMs sold in China were clopidogrel, NaCl infusion, omeprazole, acarbose, amlodipine, propofol, oxaliplatin, ambroxol, cefazolin, vermox, and amlodipine.

### Table 1: Estimated sales amounts of essential medicines in the survey cities, provinces, and the whole nation

| Survey cities | Sales amount in cities (million USD*) | Survey provinces/municipalities | Sales amount in provinces (million USD*) | Total health expenditure percentage (city/province) | Total health expenditure percentage (%) | National sales† (million USD) |
|---------------|--------------------------------------|---------------------------------|----------------------------------------|-----------------------------------------------|----------------------------------------|-----------------------------|
| Beijing       | 756.42                               | Beijing                         | 756.42                                 | 100.00                                        | 4.07                                   | 18,585.26                   |
| Guangzhou     | 394.41                               | Guangdong                       | 1658.58                                | 23.78                                         | 7.56                                   | 21,938.89                   |
| Chongqing     | 202.74                               | Chongqing                       | 202.74                                 | 100.00                                        | 2.17                                   | 9342.86                     |
| Nanjing       | 202.33                               | Jiangsu                         | 1310.43                                | 15.44                                         | 6.17                                   | 21,238.74                   |

*1 USD = 6.1428 RMB in 2014. †The average of the four estimates was 17,776.44 million USD and was the estimated financing amount of essential medicines.
Table 2: Top 10 medications based on estimated sales of essential medicines in China in 2014 and their prediction sales by diseases demand

| Rank | Generic name     | Main indication                                      | WHO model lists of essential medicines | Estimated annual sales amounts (million USD*) | Predicted by demands of diseases (million USD) |
|------|------------------|------------------------------------------------------|----------------------------------------|-----------------------------------------------|-----------------------------------------------|
| 1    | Clopidogrel      | Stroke and myocardial infarction                     | Yes                                    | 1061.55                                       | N/A                                           |
| 2    | NaCl infusion    | Fluid and electrolyte replenishment/dilute other medications | Yes                                    | 749.32                                        | 83.92                                         |
| 3    | Omeprazole       | Gastroesophageal reflux disease                      | Yes                                    | 525.70                                        | 870.25                                        |
| 4    | Acarbose         | Diabetes                                             | No                                     | 515.83                                        | 1108.63                                       |
| 5    | Amlodipine       | Hypertension                                         | Yes                                    | 494.46                                        | 12,080.55                                     |
| 6    | Propofol         | Anesthesia                                           | Yes                                    | 461.41                                        | N/A                                           |
| 7    | Oxaliplatin      | Colon carcinoma                                      | Yes                                    | 450.11                                        | N/A                                           |
| 8    | Ambroxol         | Acute and chronic respiratory diseases               | No                                     | 370.01                                        | 40.89                                         |
| 9    | Cefazolin        | Antibiotic                                           | Yes                                    | 317.53                                        | 549.42                                        |
| 10   | Levofoxacin      | Antibiotic                                           | Yes                                    | 315.42                                        | 24.08                                         |

*1 USD = 6.1428 RMB in 2014. N/A: Not applicable; WHO: World Health Organization.

and levofoxacin [Table 2] among which NaCl is drip infusion, clopidogrel is mainly included in the treatments of stroke and myocardial infarction, acarbose and amlodipine are for chronic diseases, propofol is an anesthetics, omeprazole is proton pump inhibitor used in the treatment of gastroesophageal reflux disease, oxaliplatin treats advanced cancer of the colon or rectum, ambroxol is for acute and chronic respiratory diseases, and cefazolin and levofoxacin are antibiotics. The best-selling EM was clopidogrel, and its sales amount was 1061.55 million USD. The sales amounts of other EMs were listed as follows: NaCl infusion was 749.32 million USD, omeprazole was 525.70 million USD, acarbose was 515.83 million USD, amlodipine was 494.46 million USD, propofol was 461.41 million USD, oxaliplatin was 450.11 million USD, ambroxol was 370.01 million USD, cefazolin was 317.53 million USD, and levofoxacin was 315.42 million USD. The sales amounts of top 10 EMs occupied 29.60% of the total sales amount of EMs.

We also calculated the theoretical financing amount of these top 10 drugs on the basis of prescriptions by model 2. The particular drug’s financing amount in different formularies was aggregated to measure the total sales. For instance, ambroxol is used to treat bronchiectasis and acute bronchitis according to the authoritative prescription guidelines or formularies. The total financing amount of ambroxol would be 119.61 million USD, with 118.08 million USD for bronchiectasis and 1.53 million USD for acute bronchitis. The predicted demand for NaCl infusion is 83.92 million USD, and omeprazole is 870.25 million USD, acarbose is 1108.63 million USD, amlodipine is 12,080.55 million USD, cefazolin is 549.42 million USD, and levofoxacin is 24.08 million USD.

**Discussion**

Based on the estimated cost of actual use of EMs in China in 2014, we found that the financing amount is 17,776.44 million USD (109,197.10 million RMB), accounting for 3.43% of total health expenditure (the total health expenditure in 2013 in China is 3,186,895 million RMB). However, as for the demands for drugs for common diseases, the estimated cost of EM as well as the financing amount is 30,599.50 million USD. This difference resulted from the ideal situation that all patients had gone to see doctors once they had gotten sick and then had received treatments, which produced a higher demand for EMs.

The Chinese Fourth National Health Survey indicated that 37.6% of patients did not receive treatment or prescription as they should have done in 2008. Since the EMs were not prescribed to these patients, we figured out 19,094.09 million USD as the final cost of EMs by multiplying 30,599.50 million USD (the theoretical cost) and 62.4%.

The 2-week physician visiting rate also differs from cities and rural areas in China. Besides, other factors such as economic development, income increase, and health awareness will influence the cost of EMs. With the development of basic medical insurance system in China, the use of EMs will increase. Therefore, we suggest the financing amount of EMs in China is about 20 billion USD.

The definition of the rational use of medicine by WHO is that “patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community.” Therefore, the implementation of EM list can make medicine management much easier and the rational use of medicines more efficient. The report of WHO also indicated that more than 50% of all prescribed medicines had been taken incorrectly. The irrational use of medicines prevailed in China. A recent study on the rational use of medicines in China from 2007 to 2011 showed that irrational drug use was still high despite the effect brought by the implementation of China’s national EMs program.
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Conflicts of interest
There are no conflicts of interest.

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Supplementary information is linked to the online version of the paper on the Chinese Medical Journal website.

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We assumed some factors that may cause the fluctuation of the financing amount of EMs in China. There are several typical ones. First, parts of EMs are not used in clinical practice even if they have been sold, and some of them including those being expired or in transit are stored in hospitals and pharmacies. In other words, if we exclude the cost of these EMs, the value might be lower than what we get. Second, that we applied a percentage of total health expenditure to predict the percentage of sales of medicines is feasible in theory, but it may cause deviation. Third, the calculation of financing amount of EMs used in treatments of common diseases was on the assumption that physicians dutifully followed the formularies and prescribed EMs as many as possible. However, the physicians might not prescribe EMs thoroughly based on the prescriptions because of individual difference in clinical practice. Therefore, the theoretical value we calculated is the maximum one, and the real value is supposed to be lower.

In conclusion, our study indicated that the annual budget needed to provide for the EMs in China would be about 20 billion USD, and the irrational drug use continued to plague the health system with intravenous fluids and antibiotics being the typical examples.

Supplementary information is linked to the online version of the paper on the Chinese Medical Journal website.
Supplementary Table 1: Essential medicines cost for sample diseases

| Common diseases                                      | Essential medicines cost (million USD*) |
|------------------------------------------------------|----------------------------------------|
| Internal medical diseases                            |                                        |
| Vasculocardiology department                         |                                        |
| Primary hypertension                                  | 7178.00                                |
| Arrhythmia                                            | 410.58                                 |
| Myocardial infarction                                 | 1152.79                                |
| Atrial fibrillation                                   | 18.45                                  |
| Chronic cardiopulmonary disease                      | 0.45                                   |
| Laryngopharyngitis (acute)                           | 19.23                                  |
| Coronary heart disease                                | 35.06                                  |
| Paroxysmal supraventricular tachycardia              | 6.93                                   |
| Acute coronary syndrome                              | 7.28                                   |
| Proiosystole                                          | 10.62                                  |
| Heart failure                                         | 2.07                                   |
| Viral myocarditis                                     | 0.15                                   |
| Tuberculous pericarditis                             | 1.00                                   |
| Cardiac arrest                                        | 0.02                                   |
| Gastroenterology medical department                  |                                        |
| Acute gastritis                                       | 621.18                                 |
| Chronic gastritis                                     | 5384.68                                |
| Peptic ulcer                                          | 380.32                                 |
| Acute pancreatitis                                    | 27.94                                  |
| Constipation                                          | 8.35                                   |
| Hepatic cirrhosis                                     | 298.67                                 |
| Gastroesophageal reflux disease                       | 1.66                                   |
| Colitis gravis                                        | 5.19                                   |
| Respiratory medical department                        |                                        |
| Upper respiratory infection                           | 89.63                                  |
| Bronchiectasis                                        | 150.22                                 |
| Chronic bronchitis                                    | 56.17                                  |
| Bronchial asthma                                      | 4.99                                   |
| Acute bronchitis                                      | 3.21                                   |
| Neurology medical department                          |                                        |
| Cerebral thrombosis                                   | 726.50                                 |
| Bilious headache                                      | 42.44                                  |
| Senile dementia                                       | 1.73                                   |
| Cerebral embolism                                     | 0.33                                   |
| Parkinson’s disease                                   | 2.75                                   |
| Hematology medical department                         |                                        |
| Hyperlipidemia                                        | 113.72                                 |
| Hypoferic anemia                                      | 77.46                                  |
| Leukemia                                              | 18.82                                  |
| Allergic purpura                                      | 0.22                                   |
| Urology medical department                            |                                        |
| Acute glomerulonephritis                              | 55.99                                  |
| Nephritis                                             | 1.44                                   |
| Pyelonephritis                                        | 3.23                                   |
| Hematuria                                             | 0.03                                   |
| Immunologically mediated diseases and endocrine diseases |                                        |
| Systemic lupus erythematosus                          | 9.00                                   |
| Hyperthyroidism                                       | 8.91                                   |
| Arthritis deformans                                   | 0.64                                   |
| Diabetes                                              | 2756.58                                |
| Obstetrics and gynecological diseases                 |                                        |
| Dysmenorrhea                                          | 1146.70                                |
| Clistacemic syndrome                                  | 233.73                                 |
| Dysfunctional uterine bleeding                        | 283.75                                 |
| Postpartum hemorrhage                                 | 144.72                                 |
| Bacterial vaginosi                                    | 1.63                                   |
| Chronic cervicitis                                    | 0.97                                   |
| Ectopic pregnancy                                     | 2.24                                   |
| Hyperemesis gravidarum                                | 0.65                                   |
| Pelvic inflammation                                  | 0.47                                   |
| Mental diseases                                       |                                        |
| Affective disorders                                   | 8.93                                   |
| Chronic dementia                                      | 0.36                                   |
| Emergency department                                  |                                        |
| Organophosphorus pesticide                            | 0.18                                   |
| Allergic shock                                        | 0.17                                   |
| Surgical diseases                                     |                                        |
| Urinary surgery                                       |                                        |
| Prostatic hyperplasia                                 | 168.02                                 |
| Urolithiasis                                          | 1140.16                                |
| Acute urinary tract infection                         | 127.73                                 |
| Acute cystitis                                        | 1.42                                   |
| Prostatitis                                           | 3.34                                   |
| General surgery                                       |                                        |
| Acute appendicitis                                    | 140.69                                 |
| Acute peritonitis                                     | 8.38                                   |
| Chronic pancreatitis                                  | 0.90                                   |
| Hepatobiliary surgery                                 |                                        |
| Acute cholecystitis                                   | 10.47                                  |
| Chronic cholecystitis, cholelithiasis                 | 1639.63                                |
| Anus and intestine surgery                            |                                        |
| Hemorroids                                            | 810.63                                 |
| Pruritus ani                                           | 0.01                                   |
| Breast surgery                                        |                                        |
| Lobules of mammary gland                             | 10.87                                  |
| Acute mastitis                                        | 1.41                                   |
| Orthopedics                                           |                                        |
| Proliferative arthritis                              | 13.29                                  |
| Osteoporosis                                          | 38.93                                  |
| Neurosurgery                                          |                                        |
| Subarachnoid hemorrhage                               | 1.22                                   |
| Infection                                             |                                        |
| Infantum tetanus                                      | 0.0006                                 |
| Infectious diseases                                   |                                        |
| Ascariasis (children)                                 | 11.46                                  |
| Pulmonary tuberculosis                                | 31.13                                  |
| Virus hepatitis (acute)                               | 12.30                                  |
| Virus hepatitis (gravis)                              | 26.69                                  |
| Common cold                                           | 2.10                                   |
| Aden fever                                            | 4.24                                   |
| Dysentery                                             | 1.74                                   |
| Sarcfatinia                                           | 0.96                                   |
| Epidemic parotitis                                    | 0.25                                   |
| Typhoid and paratyphoid fever                         | 0.05                                   |

Contd...

Contd...
| Common diseases                        | Essential medicines cost (million USD*) |
|----------------------------------------|----------------------------------------|
| Epidemic hemorrhagic fever             | 0.15                                   |
| Measles                                | 0.01                                   |
| Schistosomiasis                        | 0.02                                   |
| Malaria                                | 0.07                                   |
| Pertussis                              | 0.02                                   |
| Hydrophobia                            | 0.03                                   |
| Epidemic type B encephalitis           | 0.01                                   |
| Epidemic meningitis                    | 0.02                                   |
| Pediatric diseases                     |                                        |
| Infantile diarrhea                     | 1072.71                                |
| Febrile seizure                        | 7.67                                   |
| Acute laryngitis in children           | 16.40                                  |
| Infantile anemia                       | 60.63                                  |
| Infantile pneumonia                    | 0.11                                   |
| ENT diseases                           |                                        |
| Acute pharyngitis                      | 3565.51                                |
| Acute rhinitis                         | 35.96                                  |
| Acute conjunctivitis                   | 59.72                                  |
| Chronic conjunctivitis                 | 4.05                                   |
| Chronic rhinitis                       | 6.16                                   |
| Senile cataract                         | 0.13                                   |
| Skin and sexually transmitted diseases |                                        |
| Syphilis                               | 9.83                                   |
| Gonorrhea                              | 0.58                                   |
| Acquired immune deficiency syndrome    | 1.33                                   |
| Neoplastic diseases                    |                                        |
| Colon carcinoma                        | 24.25                                  |
| Gastric carcinoma                      | 6.99                                   |
| Summary                                | 30,599.50                              |

*1 USD ≈ 6.1428 RMB in 2014. ENT: Ear, nose, and throat.