

# IMPROVING HEALTH SYSTEM EFFICIENCY

**CHINA**

## The Zero Mark-up Policy for essential medicines at primary level facilities

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China has achieved rapid economic growth and the health status of the Chinese population has achieved considerable improvement, with life expectancy at birth increasing from 35 years in 1949 to 75 years in 2012. The demographic profile of high birth rate, high death rate, communicable diseases epidemics and malnutrition has gradually been transformed into one of lower birth rate, lower death rate, and prevalence of non-communicable chronic diseases. Rapid economic growth has resulted in urbanization and industrialization, large-scale migration, and population ageing. Consequently, risk factors related to lifestyle and environmental pollution have become the major health concerns (Center for National Health Statistics and Information, 2012).

During the period 1995–2012, the total health expenditure (THE) as a proportion of the gross national product (GDP) of China increased from 3.5% to 5.4%. Government health spending as a proportion of GDP decreased during 1980–1995, but almost doubled during 2005–2012. Out-of-pocket (OOP) payments reached their peak in 2000 at 59% and began to drop gradually to 34% in 2012 (China National Health Development Research Center, 2014).

China has established a comprehensive health service provision system capable of delivering infectious disease control, emergency services, outpatient and inpatient medical services, and other specific medical services. Community health centres and their affiliated stations in urban areas, together with township health centres and village clinics in rural areas, provide primary medical care services and essential public health services. By contrast, secondary and tertiary general hospitals offer most outpatient and inpatient services. Health professionals are employed and remunerated by the health facilities.

As for the ownership of hospitals, the majority of tertiary and secondary hospitals are public institutions. The concept of social capital is encouraged by the Government and as a result the number of private hospitals (most of which are primary hospitals and specialized hospitals) operated by social capital is increasing. Both public and private hospitals need to become accredited through health insurance authorities in order to receive reimbursement for services delivered to the insured.

Government subsidy for public hospitals shrank sharply from 60% of hospitals' total revenue in the early 1980s to 24.73% by 2008. To maintain the operation of hospitals, the Government permitted them to capitalize on a 15% markup for western drugs and a 20–25% markup for manufactured traditional Chinese medicines (TCM) between wholesale and retail prices, known as the “markup policy” (China National Health Development Research Center, 2009).

Three basic medical insurance schemes in China – namely, urban employees' basic medical insurance (UEBMI), urban residents' basic medical insurance (URBMI), and the new cooperative medical scheme (NCMS) – have covered over 95% of the population (Chinese Health Statistics Yearbook, 2012). Employees in urban areas are covered by UEBMI, unemployed residents in urban areas are covered by URBMI, and residents in rural areas are covered by NCMS.

In general, pooling funds have been established by the three basic health insurance schemes in the prefecture-level city or county. Eligible expenses for hospital admissions and outpatient services for severe diseases can be reimbursed to insured users from the pooling funds, with certain requirements involving deductible, copayment, and ceiling.

The UEBMI and URBMI share the same drug reimbursement list, with more extensive coverage than that for NCMS. In the latest version of the drug reimbursement list for UEBMI and URBMI, a total of 2151 drugs can be reimbursed, including 1164 chemicals and biologicals and 987 TCMs.

# 2

## OVERALL INEFFICIENCY RELATED TO MEDICINES IN CHINA BEFORE 2009

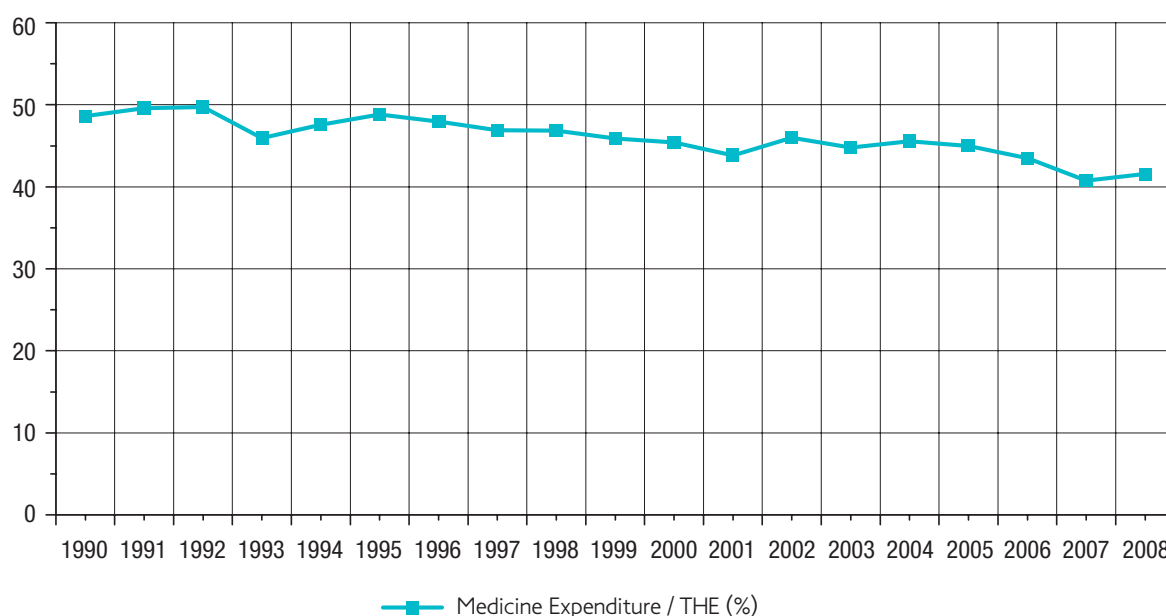
### 2.1 General situation

#### 2.1.1 Share of medicine expenditure relative to THE and GDP

For an extensive period of time, drug sales constituted a major proportion of healthcare providers' revenue in China. Between 1990 and 2008, the proportion of medicine expenditure relative to total health expenditure fell, on average, from 55.97% to 42.67% (Figure 1). This decline reflected the slightly slower growth rate of medicine expenditure in relation to the total health expenditure in the long term.

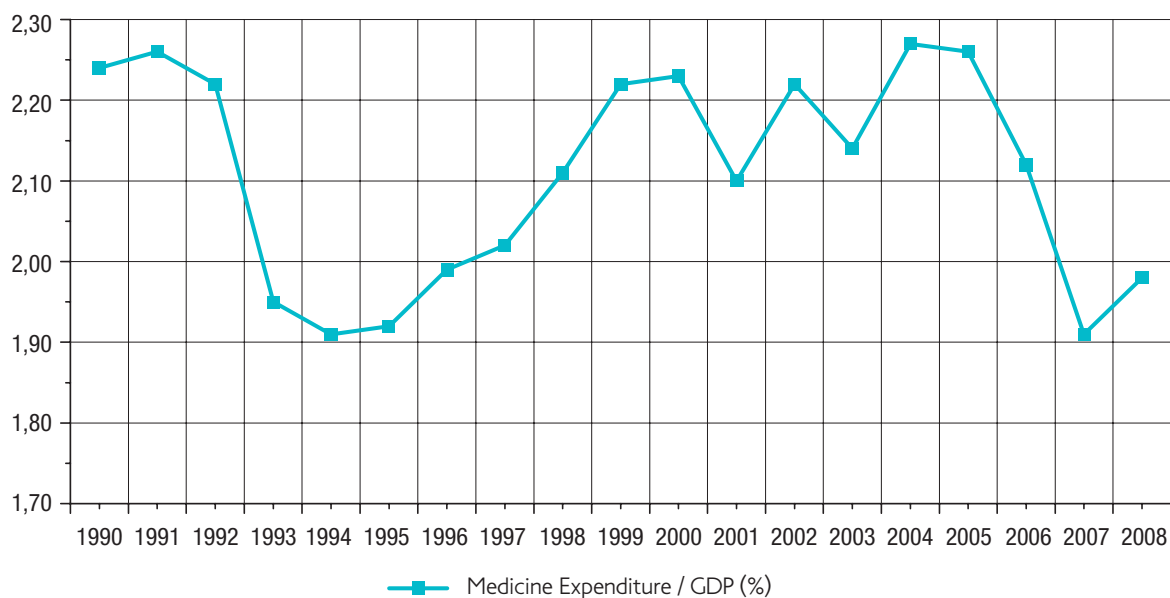
However, the percentage remained at a high level of over 40% and the declining trend was very slow. During the same period, the ratio of medicine expenses to GDP fluctuated by approximately 2% (Figure 2) (Center for National Health Statistics and Information, 2005, 2010, 2012). Hence, one persistent criticism of the (arguably inefficient) health system of China maintains that it is prone to overdependence upon, overemphasis on, and excessively strong influence from drug expenditures (Eggleston et al., 2008).

**Figure 1. Share of medicine expenditure relative to total health expenditure**



Source: China National Health Development Research Center (2013).

**Figure 2. Share of medicine expenditure relative to gross domestic product (GDP)**

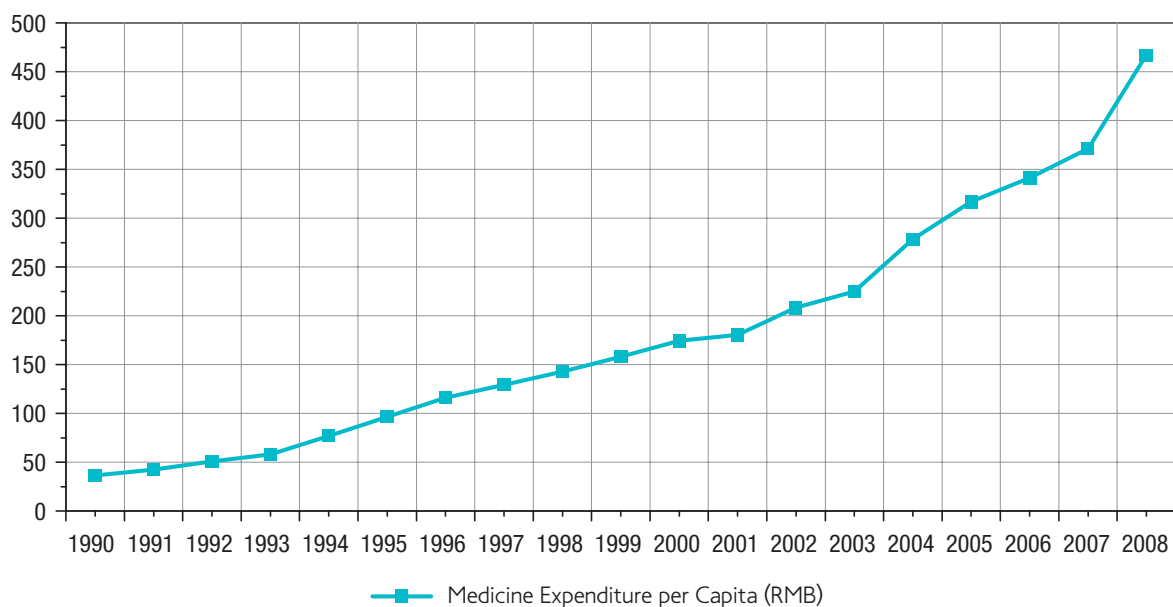


Source: Center for National Health Statistics and Information (2005, 2010)

### 2.1.2 Growth of medicine expenditure per capita

The medicine expenditure per capita grew at an annual rate of 15%, from 36.59 Yuan to 467.04 Yuan, between 1990 and 2008 – higher than the growth rate of GDP during the same period. As shown in Figure 3, the rate of growth accelerated during the several years before 2009 (Center for National Health Statistics and Information, 2005, 2010, 2012).

**Figure 3. Medicine expenditure per capita (RMB)**



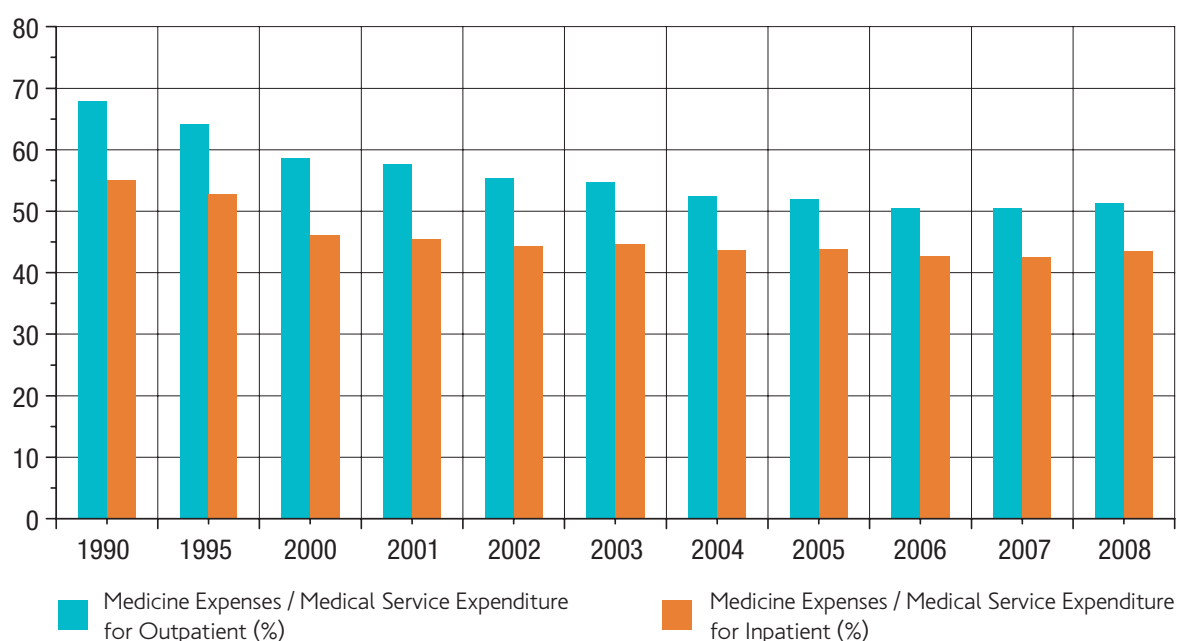
Source: Center for National Health Statistics and Information (2005, 2010).



### 2.1.3 Share of medicine spending relative to healthcare service expenditure

Between 1990 and 2008, the average healthcare expenditure per outpatient visit increased from 10.9 Yuan to 146.5 Yuan and inpatient expenditure increased from 473.3 Yuan to 5463.8 Yuan. As shown in Figure 4, the share of medicine spending relative to healthcare service expenditure experienced a slow but steady decrease between 1990 and 2008. However, drug expenses still accounted for 51.3% of the total medical service expenditure per outpatient visit and 43.5% per inpatient visit in 2008 (Center for National Health Statistics and Information, 2005, 2010, 2012). Thus, limiting pharmaceutical expenditure plays an important role in controlling health spending and keeping health care affordable.

**Figure 4. Medicine expenditure compared to healthcare service expenditure**



Source: Center for National Health Statistics and Information (2005, 2010).

### 2.1.4 Proportion of antibiotics, infusion, and injection per prescription

Besides the high utilization rate of medicine, an irrational prescribing pattern has exacerbated the problem. According to a study based on the Fourth National Health Services Survey in 2008 (which involved 282 healthcare facilities in 31 provinces), the overuse of antibiotics, infusion, and injection in outpatient prescriptions prevailed.

In urban community healthcare centres, the rate of prescribing antibiotics was 45.3%. The percentage was 60.8% in township health centres, and 65.9% in village clinics – where over 20% of all outpatient prescriptions contained two or more antibiotics, much higher than the average level of 43.3% of antibiotics utilization in middle-income countries.

The proportion of prescriptions utilizing infusion was 32.8% in urban community healthcare centres, 29.8% in township health centres, and 28.1% in village clinics (higher than the level of 23.1% in low-income countries). Also notable was the large scale of injection utilization in both urban and rural areas – 41.8% in urban community healthcare centres, 42.3% in township health centres, and 48.2% in village clinics – beyond the range of 20.0% to 26.8 % for developing countries recommended by WHO (Fudan University, 2009).

A cross-sectional study undertaken in 680 village primary-health clinics from 10 provinces of Western China also indicated that the percentage of prescriptions with antibiotics was 48.43 (range: 41.12–57.47) (Dong et

al., 2008). Another nationwide study carried out in 28 cities from 28 provinces in China reported that 43.5% of prescriptions used antibiotics (Liu et al., 2009). Some studies reported that 22.93–61% of encounters were prescribed with injection at various levels of health institutions (Xiao et al., 2011), which is much higher than the international standard recommended by WHO (13.4–24.1%).

## 2.2 Impact on quality and access to care

The overuse of antibiotics, infusion, and injection leads to the increase of prescription fees and the suboptimal quality of medical-service delivery. A study estimated that approximately half of antibiotic prescriptions in China were medically unnecessary (Sun et al., 2008). Such an irrational prescribing pattern contributes to the severity of antimicrobial resistance and poses huge risks to public health.

Partially because of high pharmaceutical spending and improper prescribing behaviour, China experiences substantial problems in access to medicines due both to the lack of availability of essential medicines and to the high cost of and preference for branded products (Chen et al., 2010).

It is clear that rapidly rising medicine expenses and irrational use of antibiotics, as well as excessive focus on profitable drugs, have made health care increasingly unaffordable and inaccessible for Chinese citizens – especially for those low-income families (Eggleston et al., 2008).

## 2.3 Causal and influencing factors

The economic incentive for hospitals and physicians to rely on medicine utilization has been widely recognized as the major cause of inefficiency. Moreover, the distortion of medical services and medicine prices regulated by the Government and the fee-for-service payment method employed by health insurance schemes has exacerbated this inefficiency.

The perception of high medicine expenses is partially attributed to the relatively low financial subsidies from the Government, which covered merely 6.97% of the total revenues of public hospitals in 2008 and 18.07% of the total revenues of primary-healthcare facilities in 2007 (Center for National Health Statistics and Information, 2010). Meanwhile, the price of healthcare services – which never covered proportionately the realistic cost – was strictly regulated.

To compensate for the insufficient Government subsidy, the Government has from the mid-1950s officially permitted a certain percentage markup on medicines for healthcare facilities (15% for western medicine and 20–25% for TCM). That markup remained for decades – until very recently. As a result, healthcare facilities have turned to drug sales as one of their main sources of revenue, which provides a strong motivation for them to overprescribe unnecessary medicines (Sun et al., 2008).

Such a perverse financial incentive also lies at the core of the overall inefficiency related to medicine utilization. Because a large proportion of healthcare facilities' revenue comes from profits on pharmaceutical sales – especially those at the primary level (Chen et al., 2010) – and regulations on profit margins are based upon a certain percentage of the procurement price, healthcare institutions and physicians have strong financial incentives to dispense highly-priced medicines in order to simultaneously maximize the revenue of the institutions and profit from bonus payments on the individual level. Physicians working in public health facilities tend to overprescribe medications, as well as prescribe in accordance with profit margin rather than clinical efficacy.

Moreover, the fee-for-service payment employed by health insurance schemes, coupled with a distorted price schedule and emphasis on pharmaceutical profits, gives even stronger incentives for healthcare providers to promote demand for profitable drugs while stinting on less-expensive ones.

## 2.4 Solution to the inefficiency

Even after years of efforts to reduce health institutions' reliance on drug sales to subsidize their operating costs, drug sales still accounted for 40.49% of primary healthcare facilities' total revenue and 41.28% of hospitals' revenue in 2007 (Center for National Health Statistics and Information, 2008). In response to this serious situation, more and more discussions have been focused on separating physicians' prescribing functions from pharmaceutical sales.

The zero-markup policy was considered as one of the most direct ways to terminate the economic incentives behind prescriptions. Primary-healthcare institutions, which receive a relatively high proportion of medicine revenue and play an increasingly important role in the health system, have been selected to conduct the zero-markup policy at the current stage since 2009. Together with the essential medical policy in primary-healthcare institutions, the zero-markup policy aims to delink the relationship between medical services and medicines, and gradually form a sustainable compensation system for primary-healthcare institutions.

## RATIONALE AND OBJECTIVES OF THE ZERO-MARKUP POLICY

### 3.1 Delinking the financial relationship between medical services and medicines delivery at the first stage

In developed countries such as Germany, pharmacies are operated independently from hospitals. Patients obtain medicines in pharmacies, with prescriptions from doctors. Since physicians do not have ownership in pharmacies, no previously agreed bonus for physicians exists, preventing the generation of perverse economic incentives from prescriptions. Under this mechanism, there is no incentive for physicians to prescribe expensive or excessively dosed medicines.

In China, markup on drugs was legalized by the Government to maintain the operation of healthcare facilities with a decrease in the proportion of support from the Government subsidy. This measure provided perverse economic incentives for overuse of medicines. To address this serious problem, the zero-markup policy was introduced, with the aim of delinking the financial relationship between medical services and medicine delivery. More specifically, markup of medicines is no longer permitted, removing the economic incentives for overprescription (Mao et al., 2013). In the long term, a sustainable compensation system will be formed; such a system, without perverse economic incentives for overprescription and other medical activities, can return practice to rationality (Chen et al., 2011).

In order to improve access to basic health care, primary-healthcare facilities boomed – both in number and in scale – after 2000. However, the diversity of services delivered is limited by providers' capacity and patients' expectations. Accordingly, in most cases the proportion of medicine expenses to total revenue is relatively high.

Meanwhile, the lower price charged in primary-healthcare facilities is a practical way to attract more utilization of care at the primary level (in China, there is no restriction on patients' choice of healthcare provider). Primary-healthcare facilities play an increasing role in the management of chronic diseases, as well as serving as gatekeeper of the healthcare system. After careful consideration, primary-healthcare facilities were selected to conduct the zero-markup policy since 2009.

### 3.2 Establishing a sustainable and efficient long-term compensation system for primary-healthcare institutions

Delinking the financial relationship between prescriptions and health services is one of the most important measures needed to conduct the zero-markup policy. However, the core of this policy is to establish a more sustainable and efficient compensation mechanism for primary-healthcare institutions. Healthcare facilities will not survive or operate smoothly when the former markup is removed from their revenue. Only by establishing a sustainable and efficient compensation system can primary-healthcare institutions develop in the long term.

#### 3.2.1 The current compensation system in primary-healthcare institutions does not promote the rational use of medicines – especially for essential medicines

A national survey of the current compensation system in primary-healthcare institutions indicated that the system is unable to ensure the accessibility and rational use of essential drugs. This finding urges the implementation of the zero-markup policy (Fudan University, 2009).

Currently, the Government financial subsidy, medical-service revenues, and drug revenues are the main funding resources for maintaining the operation of primary-healthcare institutions. However, Government investment greatly decreased after the 1990s. Even though the Government subsidy has been rising recently, it still remains a relatively small proportion of the total revenue. Meanwhile, the regular medical services provided by primary-healthcare institutions were maintained at a low price for decades, and the price is still under strict control by the Government. Drug revenue, with at least the 15% markup permitted by the Government, became the most important resource for funding the costs of facility operation.

Once the relationship between drug profit and the financial balance of medical institutions was established, medical activities could not be rational. Since the ceiling price of drugs was regulated by the Government, there were two ways to increase total revenue and corresponding profit. The first was to increase the quantity of medication, which led to excessive dosage or abuse of unnecessary drugs. Another was preference for the use of expensive drugs. Although the same proportion of markup was allowed, the higher prices of those expensive drugs yielded more profit than cheaper ones.

Overuse of antibiotics and injection were among the most typical phenomena during that period, resulting in waste of resources (both of materials and the services of healthcare professionals) and damage to service quality. Another trend involved new generations of antibiotics, which are usually more expensive than older generations, and became more popular and widely used in China (Liang et al., 2011).

When expensive drugs and intravenous (IV) injections are preferred by doctors, then medical institutions, drug manufacturers and distributors cannot realize enough profit from essential medicines with lower prices. Hence, essential medicines are not popular among manufacturers, distributors and doctors, and thus accessibility of essential medicines cannot be guaranteed.

Therefore, the markup policy on medicines is a huge barrier to the essential medicine policy, in that healthcare providers – driven by perverse economic incentives – will not consider essential medicine as a priority. Accordingly, the rational use of medicines and the accessibility of essential medicines have remained on political agendas, but without much practice in real life (Fudan University, 2009).

### **3.2.2 The zero-markup policy eliminates perverse economic incentives in prescription behaviour**

Although it does not seem practical to change the compensation system extensively for primary-healthcare institutions, removing the perverse economic incentives from prescriptions has become an urgent need. Government regulation has the power to affect the management of healthcare institutions and the behaviours of health professionals.

However, methods used by the Government will lead to various reactions from providers. Price cutting has been implemented in China several times to control the rapid increase in medicine expenses. However, negative impacts have been observed, in that manufacturers were not willing to provide cheap drugs and small manufacturers were not able to survive at the new low price levels.

The implementation of the zero-markup policy, by contrast, could eliminate economic incentives from prescriptions, as could the policy of separating revenue and expenditure of primary-healthcare institutions. These measures could return medical practice to a rational approach. The current phenomenon whereby “medical institutions live on drugs” would be changed completely, and medical workers could focus on providing proper medical services. Cost-effective drugs and medical services would be returned to the preferred list of doctors, which would gradually lead to improvements in the quality of medical services and the satisfaction of patients.

### **3.2.3 A proper compensation mechanism should be developed to promote rational use of medicines**

It should always be borne in mind that healthcare institutions need to be given proper compensation after the removal of drug markup. Otherwise, such removal would simply transform the markup into other kinds of unintended consequences such as new negative incentives. Bonuses or other kinds of benefit from pharmaceutical manufacturers and distributors would become part of doctors’ personal incomes, which may be more harmful due to the greater difficulty of monitoring and punishing such abuses.

As to specific approaches to compensation, the Government financial subsidy was recognized as one of the best ways to promote public welfare. Drugs tend to feature a private-property product, involving rivalry, exclusiveness, and consumer surplus during consumption. They can therefore hardly be classified as a public good and it is not appropriate that they be provided by the Government.

Moreover, if drugs were provided free of charge as welfare or non-profit goods, such an approach would inevitably incur significant moral hazards – with excessive medicine use and even waste of resources when patients do not have to pay any cost. Low efficiency is also another issue causing concern. Government investment in health is still inadequate in China; increasing its investment in pharmaceutical products would result in a great burden on the Government. All these obstacles indicate that the most appropriate timing for the Government subsidy to become the only resource of compensation for primary-healthcare institutions is yet to come (Fudan University, 2009).

In the interim, social health insurance is a better source of compensation. With the ultimate goal of universal health coverage, basic health-insurance schemes (with growing population coverage) play an increasingly important role and have more influence on medical practice.

Prepayment methods, whereby medical-insurance payments are made to providers, have also been recognized as among the most effective ways to control health expenditure (Fudan University, 2009). As total revenue is determined in advance, there are no economic incentives for medical institutions to overprovide services; they can only increase revenue through cost reduction. Thereby, medical institutions would theoretically prefer to provide rational and necessary medical services in accordance with clinical guidance, and essential medicines which are more cost effective would become the first choice.

However, there are three main health insurance schemes whose current prepayment systems are still in the exploration and adjustment phases, and in which only limited medicines and medical services are covered. Inequity in the use of medicine would occur among different insurance schemes if those schemes became the main source of compensation. Moreover, medical services and medicines not covered by insurance schemes would be totally out of control.

In addition, medical insurance agencies have limited autonomy and influence in the management of healthcare facilities, and so it is beyond their power to control the delivery of drugs. In brief, the compensation mode through medical insurance prepayment, has a long way to go before it can ensure the rational use of medicines and the accessibility of essential medicines.

The zero-markup policy provides a practical way to separate economic incentives from prescriptions. However, it is also crucial to implement corresponding policies so as to guarantee the sustainable development of primary-healthcare facilities and gradually promote the rational use of medicines and the quality of medical services.

One of the five primary mandates from China's 2009 health reform (among others, such as public hospital reform and public health service accessibility) was a specific focus on strengthening primary-healthcare facilities in China at the central level. For this purpose (in addition to expanding the number of primary facilities in remote regions and providing training programmes to primary care physicians), the compensation mechanism for primary-healthcare facilities was to be reformed.

Specifically, it was legislated that the zero-markup policy was to be implemented in these facilities; drug markup was no longer a valid and legal source of income for healthcare professionals. Instead, separation of revenues and incomes (so-called “two separate routes between revenues and income”) was to be practised.

According to the objectives of the zero-markup policy, its content can be divided into three sections: first of all, to remove the markup on medicines delivered at the public primary-healthcare level; secondly, to establish a new compensation mechanism for primary- healthcare institutions; and lastly, to extend the implementation of the zero-markup policy from public primary healthcare institutions to private sector and other hospitals.

#### **4.1 Eliminate the markup between wholesale and retail prices of essential medicines at public primary-healthcare institutions**

According to the National Essential Medicines Policy (NEMP) implemented in China since 2009, the zero-markup policy means there is no markup between wholesale and retail price of essential medicines at primary-healthcare institutions. Medicines should be sold to patients at the price procured by primary-healthcare institutions, and no markup is allowed.

#### **4.2 Establish a new compensation mechanism for primary-healthcare institutions**

##### **4.2.1 Stage I : specific Government subsidy for essential medicines (short term)**

After the implementation of the zero-markup policy, a special Government subsidy is allocated to compensate primary-healthcare institutions for reduced drug profit. The zero-markup policy was a thorough reform of the financial resources of primary-healthcare facilities and it is hard to determine the final compensation mode without sufficient evidence, especially that involving operational data at the facility level. Hence, the specific Government subsidy was regarded as a transition for achieving the financial balance of primary-healthcare institutions in the short term.

This mode has two forms: quota-compensation and proportion-compensation. The fixed prescription or physician service fee was generally utilized as quota-compensation. Under this mode, a certain prescription or physician service fee set by local government is used to compensate the providers who prescribe the medicines. Regardless of the actual expense or usage of medications for each prescription, physicians are encouraged to prescribe medicines rationally.

Local governments can also choose a certain proportion of total medical expenditure or government health spending as proportion-compensation. Both forms ensure the revenue of primary-healthcare institutions,

while delinking the subsidy from medicine expenses and at the same time according greater value to the work of medical professionals. Local governments can adopt these forms flexibly, according to their fiscal situation and the implementation of the zero-markup policy (Fudan University, 2009).

#### 4.2.2 Stage II: comprehensive compensation

After the zero-markup policy had been initially implemented with the specific Government subsidy provided and sufficient evidence collected, a well-designed and evidence-based comprehensive compensation system was introduced in the later stages of the implementation of the zero-markup policy. This system replaced specific Government subsidies.

The aim of comprehensive compensation is not only to compensate primary-healthcare institutions for reduced drug profits as a result of zero-markup, but also to facilitate a comprehensive reform of the economic compensation system of primary-healthcare institutions. More specifically, it will associate the workload with the revenue of health providers on the basis of overall performance. Under this compensation system, a new and sustainable compensation mode will be established to take the place of the “medical institutions live on drugs” mode of the past (Fudan University, 2009).

There are two levels on which this comprehensive compensation can be achieved. The first is to compensate health institutions on the basis of overall performance assessment. The quantity and quality of public health services and basic medical services delivered – as well as patient satisfaction, among other measures – should be considered as the indicators for the performance assessment of primary-healthcare institutions. Secondly, Government funds should be allocated to primary-healthcare institutions in advance, to ensure their operation. Subsidies should be determined based on the performance assessed at the end of year (Fudan University, 2009).

Because primary-healthcare institutions are compensated for performance, health professionals are then paid according to their professional performance. The performance-based salary plan is generally in accordance with the local wage standard for civil servants. A framework has been designed whereby 50–70% of the salary will be guaranteed as basic salary, while 30–50% of the salary will be decided based on individual performance. This approach hopefully provides incentive to health professionals to improve their work performance.

### 4.3 Extend policy implementation to private sector and other hospitals

The zero-markup policy has been implemented in public primary-healthcare institutions in its first three years, and is planned for implementation in private sector and other hospitals in the future.

## 4.4 Parallel (matching) policies<sup>1</sup> conducted with the zero-markup policy

#### 4.4.1 Selection and adjustment of the Essential Medicines List

Essential medicines are those which can meet the needs of basic medical and health care, are available in appropriate dosage forms, and are priced reasonably – with sufficient supply and with equitable access to the public. The National Essential Medicines Policy (NEMP), which was implemented in 2009, requires that primary-healthcare institutions be equipped with and utilize essential medicines. Chemical drugs, biological products, and proprietary Chinese medicine are included in the national Essential Medicines List (EML).

The selection of national essential medicines was guided by the following principles: the essential need for prevention and treatment, safety and effectiveness, reasonable pricing, and convenience of administration. It was also specified that Chinese and western medicine were to be otherwise equally selected. The drugs were of first choice (line medicine) in clinical practice, guaranteed basic needs, and could be used at the primary level.

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<sup>1</sup> Parallel (matching) policies: the zero-markup policy was actually conducted by means of a series of other policies. The most important feature of this series of policies involves the zero-markup regulation on the sale of essential medicines in primary-healthcare facilities. Meanwhile, other measures were introduced to support the same policy objectives.



The formulation of the National Essential Medicines List (NEML) was also connected with the primary public-health service system, the basic medical service system, and the basic medical insurance system. As a result, only 307 generic medicines had been selected for the NEML in 2009, which was updated to 520 generic medicines in 2013 – with more extensive development of the public-health and basic medical insurance systems for four years following health reform.

#### 4.4.2 Centralized bidding procurement

According to the NEMP, procurement for essential medicines should be province-based, with centralized bidding (General Office of the State Council, 2010). The procurement targets included:

- choosing guaranteed suppliers with good credits, to ensure maximal quality of medicine;
- purchasing the most cost-effective varieties in appropriate quantities;
- assuring timely supply; and
- securing the lowest purchase price.

In order to achieve the above goals, the respective responsibilities of various Government departments has been clarified, and effective and transparent management is expected to be conducted. For example, appropriate standards should be established for:

- the selection, classification, and quantitative bidding procurement of essential medicines;
- the adoption of sound financial management procedures and competitive procurement methods;
- the selection and monitoring of the quality management system of the supplier and the medicine; and
- the formulation of a set of standardized procedures to measure purchase price for guiding purchasing decisions.

(General Office of the State Council, 2010.)

To improve the efficiency of procurement, the following principles were recommended:

- only registered and licensed goods from qualified producers should be purchased;
- the process of procurement and purchasing should be transparent;
- all activities in the procurement process must be strictly in accordance with the formal written process;
- drugs should be purchased through a competitive procurement method, except special varieties such as medicines for use in emergencies or for rare diseases;
- all the terms proposed by the supplier in the contract should be obtained by the members of the purchasing working group;
- international or national generic names should be used;
- the supplier should be selected and supervised according to the criteria of quality, service reliability, timely supply, and financial stability; and
- intellectual property rights should be protected according to international laws.

#### 4.4.3 Adjustment of basic health services and their prices

After further implementation of the zero-markup policy and establishment of a comprehensive compensation mechanism, the content of basic health services should be reconsidered. Moreover, the price schedule of health services has not been updated for decades – which is clearly not in accordance with the economic development China has witnessed and the price inflations associated with that development, and is not a proper set of criteria by which to pay health professionals. Removing the markup on medicines, while raising the price of health services at the same time, would more appropriately direct healthcare practices towards becoming more regulated and rational.

## IMPLEMENTATION OF THE ZERO-MARKUP POLICY

Policy development and implementation were driven by the political commitment of central and local governments, and a strict timetable was established to track progress. Accordingly, implementation began with pilot programmes and was then extended to the whole nation.

A research study indicated that approximately 98.8% of Government-run primary-healthcare institutions and 41.5% of village health posts have conducted the zero-markup policy for purchasing essential medicines (Hu, 2013). Moreover, the decentralization of the zero-markup policy to the provincial level also provided autonomy of decision-making and the flexibility to adapt better at the local level.

### 5.1 Pilot and extension

The pilot of the NEMP was launched at the beginning of 2010 in community health-service centres or township hospitals in many provinces. Community health-service centres or township hospitals have realized integrated management, with lower-level clinic posts selected by many provinces to implement the policy. The pilot programmes were implemented in batches, and later universal coverage was achieved incrementally.

Each pilot province strictly executed the official documents from the central Government. Moreover, provincial and municipal guidance documents concerning the NEMP have been tailored to local contexts. Targeted subjects, time periods of operation, scope of execution, and measures for the development of the NEMP have been explicitly stipulated. Table 1 lists the provincial implementation of the NEMP in five provinces.

**Table 1. Derivative policies of the National Essential Medicines Policy in five provinces of China**

Province	Guidance policy	Organization and management	Time for implementation	Scope of implementation	Enforcement mode
Zhejiang	Opinions concerning the implementation of promoting the national essential drugs system (trial); implementation plan for centralized procurement of drugs in Zhejiang Province in 2010.	Establish provincial coordination team for essential medicines, consisting of Ministry of Health, National Development and Reform Commission, Provincial Human Resources and Social Security Department, Provincial Department of Commerce, Provincial Food and Drug Administration, etc.	The first pilot began on 23 February 2010; the second pilot extended from 1 July to 25 December 2010.	All primary medical and health institutions in 90 counties (city, district) were covered; 1657 community health service centres (institutes) and 5388 community health service stations (village clinics) implemented the zero-markup policy.	Transition phase: within six months from the outset of the implementation, only drugs on the national list, the provincial supplementary list, and brand-name drugs could be used.

Province	Guidance policy	Organization and management	Time for implementation	Scope of implementation	Enforcement mode
					<p>Fewer than 50 varieties of medicines for outpatient facilities and medicine revenue account for less than 15% of total revenue on the county (city, district) level.</p> <p>Hospital drug varieties: the national list and the provincial supplementary list accounted for less than 40% of the total varieties of drugs, while medicine revenue accounted for less than 40% of total revenue at the hospital level.</p> <p>Well developed phase: from the end of the transitional phase to the end of December 2011, only the national list, provincial supplementary list, and the prevention and treatment for six kinds of common chronic diseases such as high blood pressure could be used.</p> <p>Universal implementation phase: only the national list and the provincial supplementary list were used.</p>
Jilin	The pilot method concerning usage, procurement and distribution of essential drugs in primary healthcare institutions of Jilin Province.	Essential Drugs Work Committee.	On 1 December 2009, the first pilot was conducted; on 1 December 2010, the province-wide essential drug system was implemented.	33.7% of provincial government-owned primary medical institutions	Monthly sales of provincial supplemented medicine were allowed to account for less than 20% of the total sales by the community health service centre, and all community health service stations were required to be equipped with essential drugs.

Province	Guidance policy	Organization and management	Time for implementation	Scope of implementation	Enforcement mode
Anhui	Opinions concerning implementing national essential drugs system in Anhui province (trial)	Essential Drugs Work Committee included: Ministry of Health, Public Prosecutors' Office, Development and Reform Commission, Finance Department, Ministry of Human Resources and Social Security, Price Bureau, and Food and Drug Administration.	The system began on 1 January 2010.	All primary healthcare institutions.	Limitations on the percentage of purchase amount or monthly purchase amount of provincial supplemented drugs were required to be less than 10% in village clinics which have achieved the integrated management of administrative and the city community health service centres; and less than 30% in rural hospitals and community health service centres. Limitations on the percentage of purchase amount or monthly purchase amount of national essential drugs: over 30% in secondary general hospitals and over 15% in tertiary general hospitals.
Shaanxi	The Key Implementation Plan for Deepening Medical System Reform in Shaanxi Province in 2009; opinions concerning the implementation of the national essential drugs system by Shaanxi Province; People's Government Office; Notification concerning implementing national essential drugs system.	Essential Drugs Work Committee: Provincial Food and Drug Administration, Ministry of Health, Finance Department, Price Bureau, Ministry of Human Resources and Social Security.	The system began on 1 February 2009, achieve universal coverage in 2011.	All primary healthcare institutions.	The usage and equipment of essential medicines were mandated, and strict control on the purchasing of nonessential drugs. Stocked drugs not on the national list should be used up before the end of May 2010.
Chongqing	Pilot in Chongqing, by General Office of the People's Government.	Essential Drugs Work Committee.	Began on 25 February, 2010.	26 counties began pilot in 2010, to achieve universal coverage in 2011.	After the enacting of provincial supplementary list, drugs not on the list should not be used in primary healthcare institutions. National essential medicines and provincial supplementary medicines should be sold at the same price as purchased by the health facilities in 30 days since the implementation of the essential drug policy.

Source: Fudan University (2009).

## 5.2 Decentralization at the provincial level and adapting to the local context

Depending upon the diversity of health resources allocation in various regions, a trend of decentralization at the provincial level was identified during the implementation of the NEMP. More specifically, provincial governments were entitled to decision-making autonomy under the guidance of principles established by the central Government; for example, they were given the flexibility to adapt various public budget management, monitoring, and evaluation approaches.

Above all, unlike the WHO Essential Medicines List that defines a core list and a complementary list, provincial authorities in China reserve the right to add additional drugs to the list (Yang et al., 2013a and 2013b). Hence, there can be significant differences between the supplementary lists in various provinces. Secondly, procurement and distribution systems of essential medicines are established at the provincial level. These systems naturally result in diversity.

Finally, as a result of the disparities in medical insurance schemes among various provinces, different reimbursement mechanisms for essential medicines are originated by local governments. Among all primary-healthcare institutions covered by the NEMP, 94.55% are reimbursed by Government financial assistance<sup>2</sup> as well as other forms (91.01% in urban community healthcare centres and 96.30% in rural township health centres reimbursed likewise). Major reimbursement mechanisms include specific financial assistance (59.64%), financial assistance and medical insurance compensation (20.73%) and a separated management of revenue and expenditure (9.45%) (Fudan University, 2011).

### 5.2.1 Implementation progress

Provincial pilot projects of NEMP have been launched in some of the primary-healthcare centres at the county level in order to gradually achieve full coverage. The overall implementation progress varies among provinces – for example, the promotion rate is faster in provinces such as Zhejiang and Anhui where the NEMP has basically covered the entire regions by 2011.

By the end of 2010, 78.80% of primary-healthcare institutions across the entire country had implemented NEMP (80.18% in urban areas and 78.15% in rural areas). The proportion of physicians trained to improve prescription behaviours under the instruction of the Clinical Guideline of National Essential Medicines was 88.44% (86.61% in urban areas and 89.23% in rural areas). The training situation included as an assessment indicator of physicians' performance involved 80.37% of primary-healthcare institutions across the country (80.00% in urban areas and 80.54% in rural areas) (Mao et al., 2013).

### 5.2.2 Provincial supplementary essential medicines lists

Apart from the NEML, most provinces have formulated a supplementary EML which is locally adapted. The number of drugs added by various provinces ranges from 150 to 200. Before the publication of the official supplementary EML, two categories restricting medication separately for urban and rural areas were available in Anhui and Jilin Province, among which Jilin Province is predicted to add 240 drugs to the list and Anhui Province to add 172 drugs to the supplementary EML.

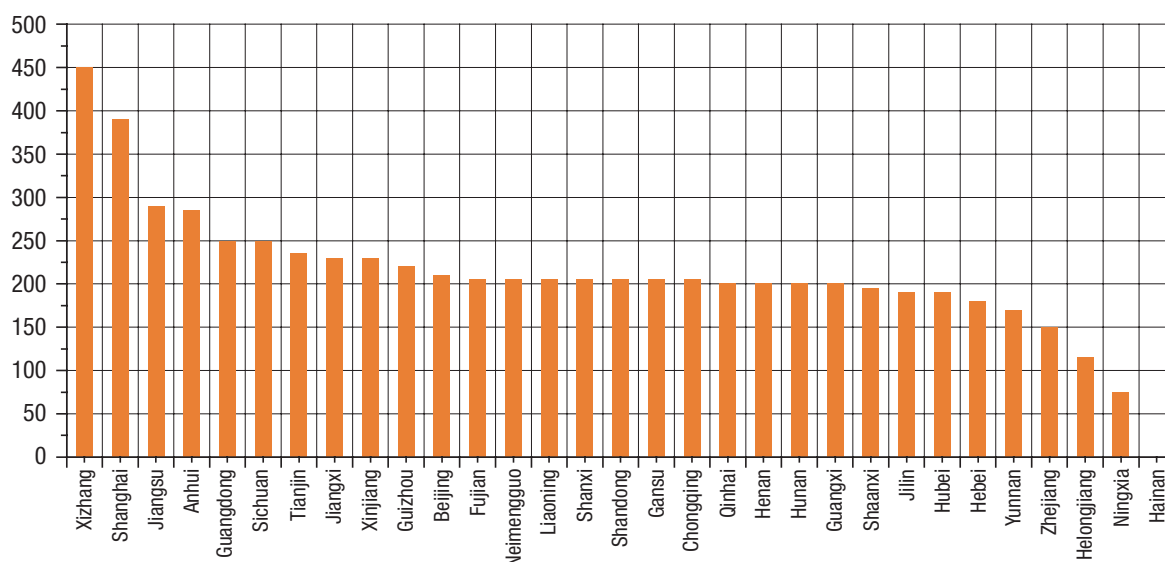
In Zhejiang Province, 150 drugs were added to the provincial supplementary EML. Counties can unilaterally add another 50 drugs to the list during the transition period. Among the additional 50 drugs, drugs specifically used for six common chronic diseases can still be stocked after the transition period and until the end of 2011. In addition, 191 drugs have been added by the Shaanxi Government and 205 drugs by the Chongqing Government.

It is worth mentioning that among all existing supplementary lists 352 traditional Tibetan medicines are available in Tibet and Qinghai Province, and 122 Mongolian medicines are available in Inner Mongolia (Tian et al., 2012).

<sup>2</sup> This support includes financial assistance and specific financial assistance. Both involve funding provided by the Government to support the development of social welfare, but specific financial assistance is usually with a specific policy goal.

One research study reported that all provinces have now increased the number of essential medicines in their local supplementary list – varying from an additional 64 to an additional 455 medicines (Figure 5) – which indicates that the NEML has lost its authority (Hu, 2013).

**Figure 5. The number of essential medicines in the provincial supplementary essential medicines list**



Source: Hu S (2013).

### 5.2.3 Equipping and utilizing essential medicines at primary-healthcare institutions

The duration of the transition period is widely regulated by provincial authorities facing the requirement of equipping primary-healthcare institutions with medicines included in the national and supplementary EML. During the transition period, previously-stocked medicines can still be utilized in Zhejiang Province. While the proportion of sales of unlisted medicines on the national and supplementary EML is strictly limited, the retail prices must adhere to the procurement price or at least not exceed the bid price or the price ceiling set by the National Development and Reform Commission (NDRC).

Similarly, both the Jilin and Shaanxi Governments formulated the purchasing quantity and sales proportion of medicines listed in both the national and supplementary EMLs. In Anhui Province, the Government required that essential medicines take priority over other drugs in equipping and dispensing them in primary-healthcare institutions. In Chongqing Province, unlisted medicines were not allowed to be used in primary-healthcare institutions after the Chongqing supplementary EML was officially introduced (Mao et al., 2012).

### 5.2.4 Procurement of essential medicines

In addition to the NEML, a province-based procurement system has been established in most of the provinces. The NDRC determines pricing policies for the EML and has been closely monitoring the supply and price of essential medicines. The medicines in the EML are purchased in bulk by provincial authorities and distributed to primary-care organizations at agreed prices (Hans et al., 2013).

Online purchasing platforms have been established by provincial authorities to perform public bidding and centralized procurement of the medicines listed on the national and supplementary EMLs.

For instance, the “bidding and price limitation system” of Jilin Province was divided into two sections, targeting essential and non-essential medicines, respectively, in 2010. As regulated by the Jilin Government, a certain category of essential medicines can be distributed either directly by the manufacturer or by the commissioned enterprise which happens to be the only distributor of this category across the entire province. A similar practice is employed by the Anhui Government, whereas the Shaanxi Government conducts a highly centralized procurement system which follows a unified purchasing, pricing, and distributing method. In particular, the procurement proportion and prices of essential medicines in secondary and tertiary hospitals are strictly regulated in Anhui Province.

#### 5.2.5 Reimbursement for essential medicines

The NEMP also conformed to the alignment of reimbursement mechanisms. Essential medicines listed in the national and supplementary EMLs are covered in basic medical-insurance reimbursement schemes in various provinces. For example, medicines in Catalogue A (which is formulated by the central Government, together with enforcement) are covered in the reimbursement schemes of the Urban Employee Basic Medical Insurance (UEBMI). The reimbursement ratio is higher for essential medicines covered by the Urban Resident Basic Medical Insurance (URBMI) and the New Cooperative Medical Scheme (NCMS).

#### 5.2.6 Parallel reforms in primary-healthcare institutions

Other parallel (matching) policies, such as performance-based salaries for health professionals, as well as standards of personnel allocation and equalization of public-health services, are also carried out by local governments. A comprehensive reform of the entire primary-healthcare system has been undertaken in many provinces, while the overall impact as yet remains undetermined.

## 6.1 Impact on access, cost, and quality of essential medicines

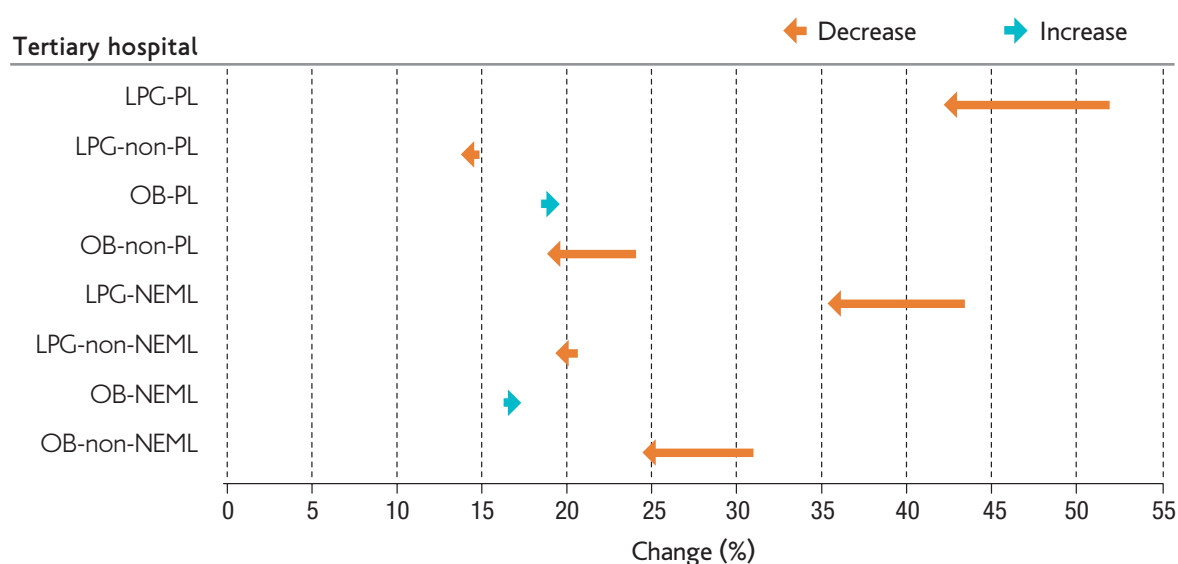
### 6.1.1 Accessibility to essential medicines

According to a study involving 431 primary-healthcare institutions across the entire country (Fudan University, 2011), the average number of drugs stocked by primary-healthcare institutions by the end of 2010 was 322 (305 by those institutions which had implemented NEMP and 349 by institutions which had not). Among these, 203 drugs were listed on the NEML. The proportion of EML drugs (both national and supplementary) in primary-healthcare institutions was 85.71% (86.14% in urban community healthcare centres and 85.53% in rural township health centres).

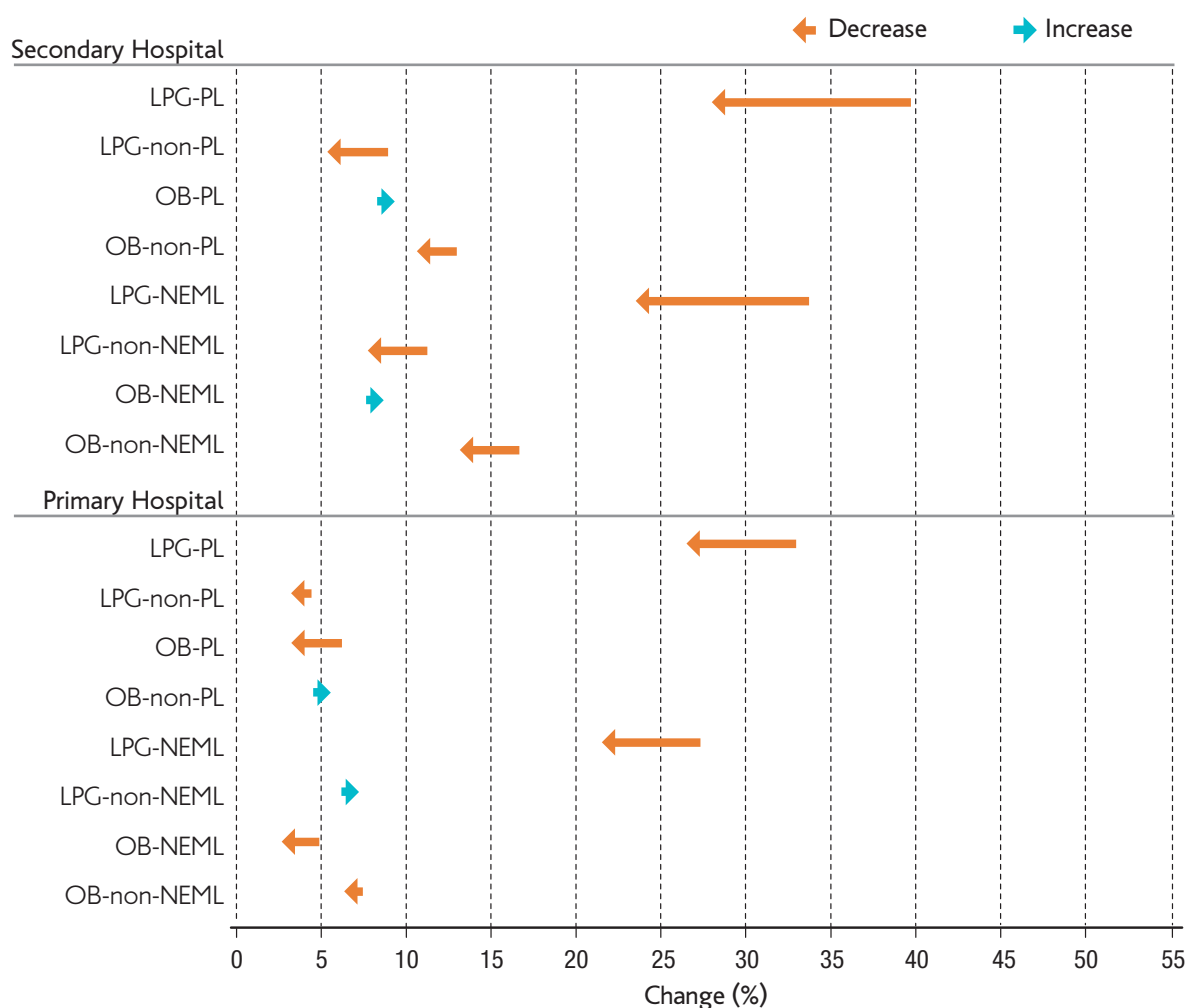
However, another study – employing a different methodology – presented a different point of view. A standard basket of generic essential medicines was chosen to measure their availability. The research indicated that the availability of a standard basket of generic essential medicines in the public sector (which was already low in 2009 at 25.5%) further decreased to 20.5% in 2011. A similar decrease (from 42.0% to 35.3%) was also indicated for generic medicines in private pharmacies (Hans et al., 2013).

Two cross-sectional surveys were conducted in Shaanxi Province to evaluate the impact of the NEMP on the accessibility of medicines. Figures 6 and 7 (Fang et al., 2013) indicate that the mean availability of surveyed medicines was low in both the public and private sectors; availability of many essential medicines decreased from 2010 through 2012, particularly in primary hospitals (from 27.4% to 22.3% for lowest-priced generics). This research raised concerns that there were decreases in the availability of the lowest-priced generic medicines in both the public and private sectors in 2012 – down from their already low availability in 2010 (Fang et al., 2013).

**Figure 6. Changes in the availability of 44 medicines in the public sector from 2010 to 2012**



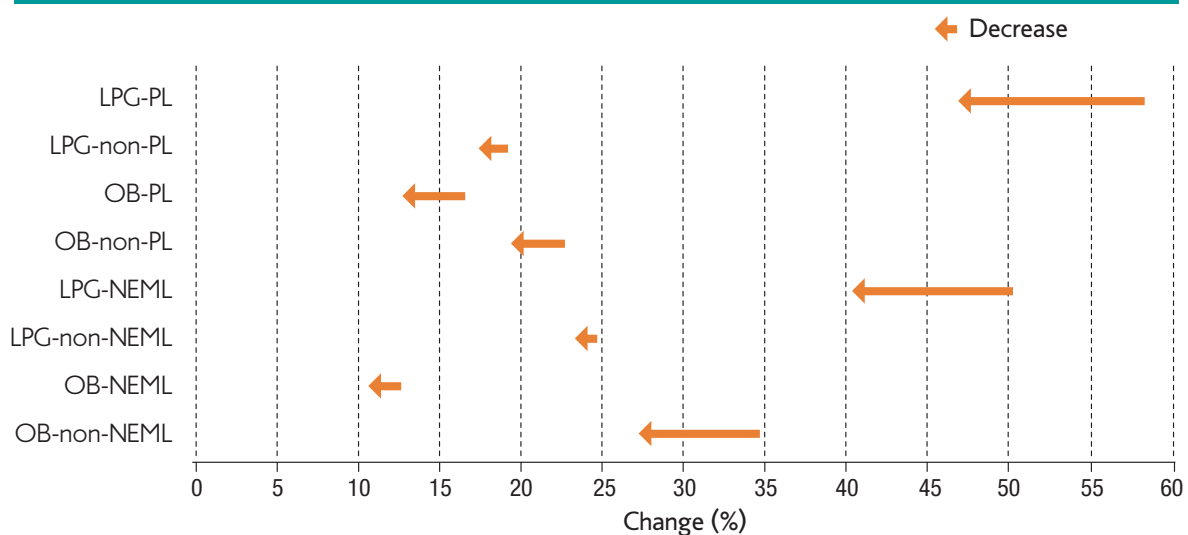




LPG = lowest-priced generic; NEML = 2009 National Essential Medicines List  
 OB = original brand; PL = 2010–12 Shaanxi provincial medicines procurement list.

Source: Fang Y, Wagner AK, Yang S et al. (2013).

**Figure 7. Changes in the availability of 44 medicines in the private sector from 2010 to 2012**



LPG = lowest-priced generic; NEML = 2009 National Essential Medicines List  
 OB = original brand; PL = 2010–12 Shaanxi provincial medicines procurement list.

Source: Fang Y, Wagner AK, Yang S et al. (2013).

Furthermore, another study focusing on access to paediatric essential medicines observed that the mean availabilities of the original brands (OBs) and the lowest-price generics (LPGs) were 10.8% and 27.3%, respectively in public hospitals and 11.9% and 20.6% in private pharmacies. The availability of the selected medicines in both sectors was low. For the 21 medicines listed in the EML, the mean availability in public hospitals was 7.5% for OBs and 27.9% for LPGs, and 3.6% for OBs and 25.2% for LPGs in private pharmacies (Wang et al., 2014).

### 6.1.2 Cost of essential medicines

One study summarized that bulk purchasing had resulted in a reduction of 25% in the average purchasing price of essential medicines, compared to maximum retail prices set by the Government pricing authority, in various provinces (Hu, 2010).

After the implementation of the essential medicine policy, it was reported that the median price of 29 generic medicines fell by 5.2% in the public sector and 4.7% in private pharmacies, while the price of 16 original-brand products was reduced by approximately 8–11% in both sectors (Hans et al., 2013).

Table 2 (Fang et al., 2013) illustrates that, in the public sector, the median adjusted patient price was significantly lower in 2012 than that in 2010 for 16 original brands (–11.7%) and 29 lowest-priced generics (–5.2%). The median Government procurement price for original brands also decreased significantly (–10.9%), whereas the decrease in the median procurement price for lowest-priced generics was not significant (–4.9%).

In the private sector, the median percentage decrease in price between 2010 and 2012 for 38 lowest-priced generics was 4.7%, compared with 7.9% (4.9–13.9%) for 16 original brands (Fang et al., 2013).

**Table 2. Median unit procurement prices of medicines in 2010 and 2012 and median product-specific price changes**

	Public sector hospitals			Private sector pharmacies		
	MUP 2010, Yuan (n=50)	MUP 2012, Yuan (n=72)	Product-specific change (%)	MUP 2010, yuan (n=36)	MUP 2012, yuan (n=72)	Product-specific change (%)
<b>Lowest-price generics</b>						
All	0.270(29)	0.133(29)	-4.9	0.416(8)	0.459(8)	-4.7
NEML	0.135(22)	0.103(22)	-5.6	0.150(27)	0.166(27)	-1.5
Non-NEML	1.005(7)	1.154(7)	2.7	1.315(11)	1.223(11)	-7.4
Proc list	0.135(22)	0.103(22)	-5.6	0.158(25)	0.178(25)	-1.4
Non-proc list	1.031(7)	1.154(7)	0.7	1.200(13)	0.970(13)	-8.3
<b>Originator brands</b>						
All	3.253(16)	2.931(16)	-10.9	3.326(16)	2.424(16)	-7.9
NEML	2.253(8)	2.024(8)	-12.5	1.388(7)	1.298(7)	-7.5
Non-NEML	4.259(8)	3.746(8)	-9.1	4.214(9)	2.472(9)	-8.3
Proc list	2.400(8)	2.103(8)	-13.0	1.388(7)	1.298(7)	-6.5
Non-proc list	4.111(8)	3.667(8)	-7.4	4.214(9)	2.472(9)	-11.2

Data are for median unit price (number of products found in both years).

MUP = median unit price n = number of facilities participating in surveys

NEML = 2009 National Essential Medicines List

Proc list = 2010–12 Shaanxi provincial medicines procurement list.

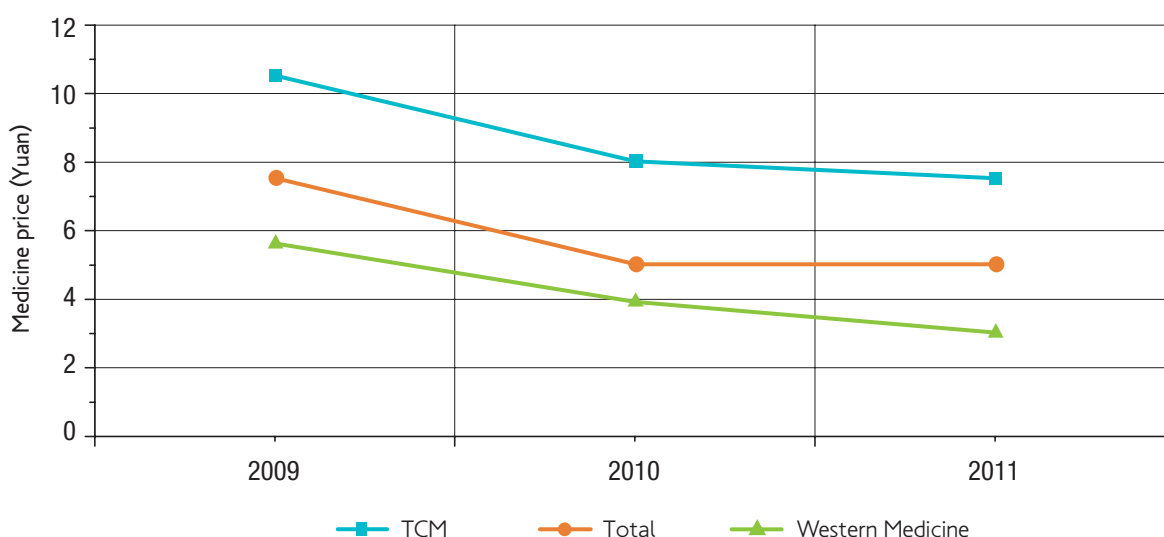
Source: Fang Y, Wagner AK, Yang S et al. (2013).

Another study in Shandong and Ningxia provinces also observed a decrease in the median of drug price (Figure 8) (Song et al., 2014a). More specifically, in the comparison between 2009 and 2010, a median decrease of 34.4% (95% confidence interval: 30.4–39.1%) was observed in drug prices, and the number of

drug sales increased by 1.5%. The higher the retail price in 2010, the more drug sales increased compared with 2009. Drug revenues in 100 of the 149 surveyed primary-healthcare centres decreased by an average of 39%.

Where the available data allowed price changes for 2009–2011 to be assessed, drug prices were reduced significantly in 2010 but a modest decrease was seen in 2011. The Laspeyres index was less than 100 and the Paasche index was larger than the Laspeyres index in 2010 and 2011, which indicated that frequently prescribed drugs usually had higher prices and any price reduction was moderate. The introduction of the NEMP in primary-health care centres led to price reductions in essential medicines. However, more expensive drugs were preferred in the post-reform period. Most primary-healthcare centres had less drug revenue and encountered financing dilemmas after the implementation of NEMP.

**Figure 8. Evolution of drug prices in Shandong and Ningxia, 2009–2011**



Source: Song Y, Bian Y, Petzold M et al. (2014a).

### 6.1.3 Quality of essential medicines

No published evidence has been found concerning the quality of essential medicines.

## 6.2 Impact on prescribing behaviour and health-service utilization patterns

### 6.2.1 Percentage of prescriptions requiring antibiotics, infusion, and injection

Among other indicators, the impact of the essential medicines policy on prescribing behaviour was the most frequently reported. A study involving 83 primary-healthcare facilities focuses on the change in prescribing patterns for six common diseases (upper respiratory tract infection, hypertension, diabetes, coronary artery heart disease, bronchitis and gastritis) after the implementation of the NEMP (Chen et al., 2014). Varied changes were found among different disease-specific prescriptions. Hypertension is an example: the prescribing trend of infusions and injections decreased over the period (2007–2010), especially in areas where the NEMP had been adopted. Thus, a negative value of policy impact on the infusion rate and intravenous (IV) injection for hypertension could be observed in both urban and rural areas (infusion rate: –12.65% in cities, –16.49% in counties; IV injection: –11.37% in cities, –12.45% in counties).

By contrast, the trend of prescribing antibiotics and hormones continued to increase in both NEMP and non-NEMP areas, but difference-in-differences (D-in-D) results showed a negative value of policy impact as well. These findings can be explained by a more rapid growth in the primary-healthcare facilities where the NEMP

has not been adopted. D-in-D results show that an increase in antibiotic prescription can be observed for many diseases, such as bronchitis, diabetes in urban areas, and coronary heart disease in rural areas. NEMP implementation had a limited impact on rational use in some cases (Chen et al., 2014), even though there were reductions in antibiotic use, infusion rate, hormone, and IV injection for such diseases as diabetes in rural areas and coronary heart disease in urban areas.

In Yang's research, prescribing practices among the surveyed doctors appeared to have improved following local introduction of the NEMP (Yang et al., 2013a). For example, exclusion of hormones (such as steroids) and certain antibiotics from the NEML had apparently reduced the (often unwarranted) prescription of such drugs.

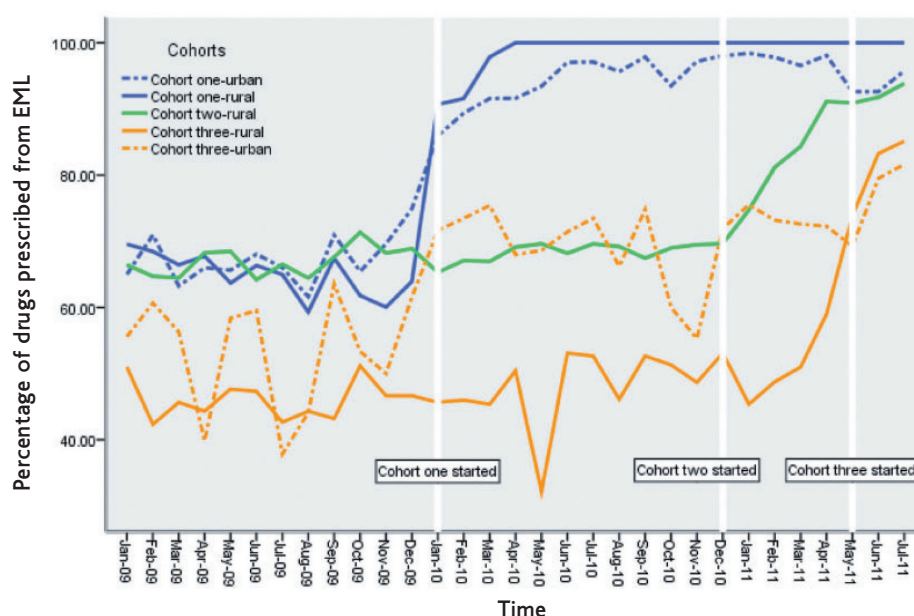
Training in rational drug use that occurred during the introduction of the NEML may also have improved prescribing practices. At the township hospitals surveyed, the mean number of drugs prescribed per patient decreased from 3.8 in the pre-implementation period of the study to 3.6 in the post-implementation period, while the corresponding mean charge for drugs dropped from US\$ 9.45 to US\$ 8.12.

However, 49.2% of the patients seen at township hospitals in the post-implementation period of study had received parenteral treatment, compared with just 39.7% in the pre-implementation period. Moreover, 68% of the doctors interviewed after implementation felt that their prescribing practices followed the recommended protocols of the NEMP.

Prescribing practices also changed in Ningxia village clinics following the local introduction of the NEMP. In these clinics, post-implementation declines were recorded in the mean number of drugs prescribed per patient (from 2.7 to 2.2), the proportion of patients being prescribed antibiotics (from 54.1% to 37.6%), and the proportion of patients with injection prescriptions (from 18.8% to 14.0%) (Yang et al., 2013a and 2013b).

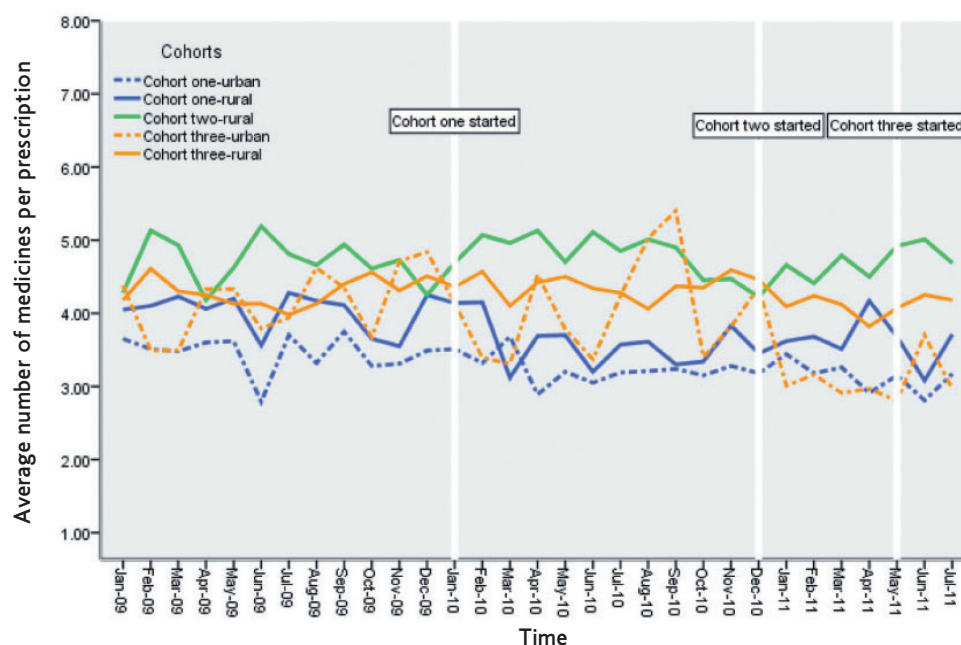
A study conducted from January 2009 to July 2011 in Hubei province focused on prescription behaviours in primary-care organizations progressively implementing the NEMP (Yang et al, 2013b). The NEMP interventions resulted in a significant increase in prescriptions of EML drugs (Figure 9). The average number of medicines per prescription remained largely unchanged before and after NEMP interventions (nearly four) despite a variance between the groups and a disparity between urban and rural health centres (3.5 as contrasted with 4.4) (Figure 10). However, no evidence has been found to demonstrate a reduction in the prescription of antibiotics as a result of the NEMP interventions (Yang et al., 2013b).

**Figure 9. Percentage of drugs prescribed from the EML by month**



Source: Yang L, Liu C, Ferrier J, Zhou W, Zhang X (2013b).

**Figure 10. Average number of medicines per prescription by month**



Source: Yang L, Liu C, Ferrier J, Zhou W, Zhang X (2013b).

Another study on the use of injections in six provinces during 2010–2011 indicated that implementation of the NEMP can decrease the overuse of injections. In the western region, the percentage of prescriptions with one or more injections was at the lowest level. In addition, the extent of the decline was largest (2.60%) during the last two years. Furthermore, Hubei (4.40%) and Shaanxi (2.95%) provinces were achieving the most notable range of decrease (Xiang et al., 2012).

Song's research also found the average number of drugs per prescription significantly decreased from 3.64 to 3.46 between 2009 and 2010. Little effect of the NEMP was found on the average number of antibiotics per prescription, but the percentage of prescriptions including antibiotics significantly decreased from 60.26% to 58.48%. Prescriptions for injections or adrenal corticosteroids also decreased to 40.31% and 11.16% of all prescriptions, respectively.

All these positive issues were also recorded in 2011. However, each of the above values remained higher than indicated by WHO standards. The percentage of drugs prescribed from the EML increased after the implementation of the NEMP. Where the available data allowed changes in costs to be assessed, the average expense per prescription increased significantly, from 25.77 Yuan to 27.09 Yuan (Table 3) (Song et al., 2014b).

**Table 3. Drug use indicators in 146 township health centres in four Chinese provinces, 2009–2010**

	Anhui			Zhejiang			Shandong			Ningxia			Total		
	2009	2010		2009	2010		2009	2010		2009	2010		2009	2010	
ANDPP	4.17	4.25	↑	3.57	3.30	↓*	3.37	3.28	↓	3.23	3.12	↓	3.64	3.46	↓*
PED, %	75.62	86.88	↑*	61.31	83.29	↑*	50.65	49.41	↓	55.35	60.59	↑	63.33	79.89	↑*
ANAPP	0.96	1.00	↑	0.79	0.75	↓*	0.73	0.71	↓*	0.72	0.81	↑*	0.81	0.8	↓
PPA, %	67.81	70.35	↑*	59.92	55.52	↓*	51.43	51.54	↑	53.15	60.38	↑*	60.26	58.48	↓*
PPI, %	51.11	50.43	↓	43.74	40.35	↓*	30.59	29.04	↓	28.36	29.97	↓	42.93	40.31	↓*
PPC, %	22.68	22.10	↓	11.91	9.22	↓*	11.09	10.70	↓	1.65	2.30	↑	13.15	11.16	↓*

Note: ↑ = 2010–2009 > 0; ↓ = 2010–2009 < 0.  
 ANDPP = average number of drugs per prescription; PED = percentage of drugs prescribed from the Essential Drug List;  
 ANAPP = average number of antibiotics per prescription; PPA = percentage of prescriptions including an antibiotic;  
 PPI = percentage of prescriptions including an injection; PPC = percentage of prescriptions including adrenal corticosteroid.  
 \* = p < 0.05, p-value refers to t-test to compare means or exact test to compare proportion distributions between the two periods.

Source: Song Y, Bian Y, Petzold M et al. (2014b).

### 6.2.2 Utilization of primary health care

According to a survey of primary-healthcare facilities conducted in 2010 in 94 counties in 31 provinces, the growth rate of outpatient visitors in primary-healthcare institutions covered by the NEMP was lower than that of those not covered (17.72% versus 35.12% in urban areas and 12.11% versus 15.31% in rural areas) (Fudan University, 2011). In addition, the referral rate to secondary or tertiary hospitals grew faster in those institutions that had implemented the NEMP (51.75% in urban areas and 28.87 in rural areas) compared with those that had not (23.51% in urban areas and 8.76 in rural areas) (Fudan University, 2011).

Both of these findings indicated a negative effect of NEMP interventions on an increased utilization of primary-healthcare institutions, as well as an improved utilization pattern of health services. One of the reasons possibly lies in the limited number of medicines in the NEMP in primary-healthcare facilities, so that patients had to seek a higher level of healthcare provider. Further research studies are required to disentangle the implications of these differences.

By contrast, other studies have shown that drug sales under zero-markup may create a powerful incentive to draw people away from choosing larger hospitals. Instead, they may choose primary-healthcare centres, since drugs dispensed from larger hospitals will be more expensive because hospitals are able to apply margins of up to 30% – whereas primary- healthcare centres under the NEMP must sell at cost price (Liu et al., 2010).

In Ningxia, Chongqing and Tianjin, increased service uptake at township hospitals has been reported (Yang et al., 2013a). The observed decreases in drug expenses may have contributed to post-implementation increases in the numbers of patients seen at township hospitals. Outpatient (including emergency) visits to township hospitals in Ningxia, Chongqing and Tianjin were 5.7%, 24.0%, and 6.2% higher, respectively, in the post-implementation period than in the pre-implementation period. Inpatient admissions to the same hospitals were 41% higher (Ningxia), 24% higher (Chongqing), and 11.8% lower (Tianjin) during the post-implementation period (Table 4).

At the time of the present study, both township hospitals and village clinics in Ningxia, had implemented the zero-markup policy. The number of patient visits to the village clinics investigated in the post-implementation period of study (when there was a zero-markup policy) was 40.8% higher than the number recorded in the pre-implementation period (when a 5% markup was allowed) (Table 4).

In contrast, in Tianjin and Chongqing, where the zero-markup policy had only been implemented in township hospitals at the time of the present study, there was a corresponding 64% decline in patient attendance at the village clinics surveyed (Yang et al., 2013a).

**Table 4. Numbers of patients before and after implementation of the zero-markup policy in China, 2009–2010**

Type and location of facility	No. of outpatients <sup>a</sup>			No. of outpatients		
	Before	After	Percentage change	Before	After	Percentage change
<b>Township hospital</b>						
Yongning, Ningxia <sup>b</sup>	12 439	12 728	+2.3	43	65	+51.2
Pingluo, Ningxia <sup>b</sup>	8 247	9 137	+10.8	16	18	+12.5
Banan, Chongqing	16 407	19 495	+18.8	1 657	2 104	+27.0
Yubei, Chongqing	15 604	20 145	+29.1	969	1 152	+18.9
Wuqing, Tianjin	19 482	19 159	-1.7	811	729	-10.1
Beichen, Tianjin	17 793	20 422	+14.8	555	476	-14.2
<b>Village clinic in Ningxia</b>						
Shengli township, Yongning	110	202	+83.6			
Wanghong township, Yongning	252	296	+17.5			
Tongfu township, Pingluo	62	96	+54.8			
Yaofu township, Pingluo	32	48	+50.0			
Mean values	114.0	160.5	+40.8			

Source: Yang L, Cui Y, Guo S et al. (2013a).

<sup>a</sup> The numbers shown are those recorded in 2010, in the first 2 months (Ningxia) or 3 months (Chongqing and Tianjin) after the policy was implemented, and in the corresponding periods of 2009.

<sup>b</sup> Only one township hospital provided inpatient services in this location.

### 6.3 Impact on expenditure levels

Expenditure per outpatient prescription was reduced in all NEMP areas and some non-NEMP areas, suggesting a decrease in overall expenditure. However, most of the D-in-D results were not statistically significant – except for antibiotics and IV injections for certain diseases. Statistically significant results can be observed in prescription expenditure for upper respiratory tract infection and gastritis in rural primary-healthcare facilities (Chen et al., 2014).

According to the above study adopting D-in-D estimates, between 2007 and 2010 medical expenditure per unit in primary-healthcare institutions in regions that had implemented the NEMP decreased by 11.2 Yuan relative to those regions that had not (taking into account the actual rise in medical expenditure in the latter regions). By contrast, the expenditure rose in both county hospitals and provincial hospitals (60.4 Yuan and 111.1 Yuan, respectively) (Fudan University, 2011). Thus, the NEMP aiming at primary-healthcare institutions had a positive effect on reducing the financial burden on patients.

Yang's research in Ningxia, Chongqing, and Tianjin also observed reduced charges to patients. Expenses for outpatients (including emergency cases) and inpatients recorded in the three provinces studied in the post-implementation period were lower (by 4.9–14.6% and 7.4–13.4%, respectively) than the corresponding values recorded in the pre-implementation period (Table 5).

Reduction in drug expenses was a major contributor to these declines. For example, total expenses and drug expenses for inpatients with pneumonia or bronchitis were lower (by 12.6% and 17.5%, respectively) in the post-implementation period than those in the pre-implementation period. The corresponding values for inpatients admitted with gastroenteritis (total costs lower by 42.6% and drug costs by 48.4%) were even more encouraging (Yang et al., 2013a).



**Table 5. Medical expenses before and after local implementation of the National Essential Medicines Policy in China, 2009–2010**

Location	Outpatient costs (US\$ per visit)		Percentage Reduction	Inpatient costs (US\$ per hospitalization)		Percentage Reduction
	Before	After		Before	After	
Yongning, Ningxia <sup>a</sup>	3.13	2.02	35.38	106.48	102.26	3.97
Pingluo, Ningxia <sup>a</sup>	4.74	4.70	0.93	101.55	90.25	11.13
Banan, Chongqing	15.38	14.06	8.55	294.20	277.50	5.67
Yubei, Chongqing	15.26	15.07	1.26	318.74	253.37	20.51
Wuqing, Tianjin	15.33	14.59	4.82	335.13	261.37	22.01
Beichen, Tianjin	18.05	15.83	12.27	325.83	324.70	0.35

US\$, United States dollar.

<sup>a</sup> Only one township hospital provided inpatient services in this location.

Source: Yang L, Cui Y, Guo S et al. (2013a). Evaluation, in three provinces, of the introduction and impact of China's National Essential Medicines Scheme. Bull World Health Organ. 91:184–194. doi:10.2471/BLT.11.097998

Another study indicated that the average expenditure per prescription declined significantly after NEMP interventions (44.67 Yuan versus 26.67 Yuan), despite a considerable variance between the groups. After the initiation of NEMP interventions, the average expenditure per prescription sharply declined and then stabilized. Urban and rural health centres demonstrated similar changes of pattern. Despite a significant disparity between urban and rural health centres before NEMP interventions, the average expenditure per prescription approached 25 Yuan (Yang et al., 2013b).

## 6.4 Impact on healthcare facilities

One study reported that income for doctors was reduced. In general, the doctors surveyed in institutions implementing the zero-markup policy were not only earning less than they had before implementation of the NEMP but were also dealing with greater numbers of patients. Their salaries and compensatory income had not increased sufficiently to protect their total incomes.

In one township hospital in Ningxia, for example, doctors' mean income had dropped by 17%. In another township hospital in Tianjin, it had dropped by 15% (Table 6). The income of the village doctors surveyed in Ningxia had also fallen, by a mean of 22%. Only in Chongqing, where a mechanism had been established to compensate staff for anticipated losses after implementing the zero-markup policy, had the mean income of doctors in a township hospital actually increased.

However, the long-term sustainability of Chongqing's compensation strategy is a cause for concern because the monthly financial support provided to township hospitals during the post-implementation period of study barely covered salaries (Yang et al., 2013a). Interviews revealed that the decrease in doctors' total incomes had a negative impact on their level of enthusiasm and satisfaction. Many doctors reported that they had tried to supplement their post-implementation incomes by increasing their fee-for-service activities, such as administration of injectable antibiotics at the township level and prescribing raw herbs and unprocessed traditional medicines (Yang et al., 2013a).

Table 6 details the changing composition of township hospital revenue. In each county/district, drug revenue as a proportion of total revenue declined following implementation of the NEMP, and the percentage of Government subsidy relative to total revenue increased by 2–28%. Ten of the 12 directors of township hospitals who were interviewed admitted to uncertainty as to how to compensate for revenue lost as a result of implementing zero markup.



**Table 6. Sources of income for township hospitals, and doctors' incomes in such hospitals, before and after implementation of the zero markup policy in China, 2009–2010**

Location	Proportion of hospital income (%) <sup>a</sup>						Mean doctors' income (US\$)		Percentage change
	Before			After			Before	After	
	Public finance	Medical treatment	Drug sales	Public finance	Medical treatment	Drug sales			
Yongning, Ningxia <sup>a</sup>	46.6	16.4	36.9	55.5	13.7	30.9	326.4	291.6	-11.0
Pingluo, Ningxia <sup>a</sup>	37.4	21.5	39.4	39.2	18.5	35.9	322.0	266.9	-17.0
Banan, Chongqing	26.4	47.1	17.6	28.0	49.3	11.9	451.1	456.7	+1.0
Yubei, Chongqing	9.3	53.6	32.0	22.1	47.7	28.6	632.8	720.5	+14.0
Wuqing, Tianjin	6.3	41.7	50.9	34.3	35.1	29.0	368.1	352.2	-4.0
Beichen, Tianjin	10.1	46.1	43.3	7.2	52.3	39.8	542.1	462.3	-15.0

US\$, United States dollar.

<sup>a</sup> Minor sources of income have been omitted.

Source: Yang L, Cui Y, Guo S et al. (2013a). Evaluation, in three provinces, of the introduction and impact of China's National Essential Medicines Scheme. Bull World Health Organ. 91:184–194. doi:10.2471/BLT.11.097998

Doctors in 5 of the 13 village clinics surveyed in one Ningxia county had stopped providing essential medicines (at zero markup) because of the lack of profit. One of these doctors complained that his ability to provide basic clinical services and meet patients' needs had been very badly affected by local implementation of the NEMP. The livelihoods of many village doctors in Ningxia are now largely reliant on Government subsidies for public-health work.

At the time of the present study, village clinics in Chongqing and Tianjin had also been adversely affected by the NEMP (even though the policy had not been implemented in those clinics) because so many patients were travelling to township hospitals where drug costs were reduced due to NEMP implementation. The mean decline of 64% in consultations observed at village clinics in Chongqing and Tianjin following implementation of the NEMP at township hospitals had reduced the mean annual revenue of such clinics from US\$ 27 16 in 2009 to US\$ 22 16 in 2010, raising doubts about their viability (Yang et al., 2013a).

## 6.5 Impact on patient satisfaction

A study reported that – in addition to revenue loss – primary-healthcare institutions also confronted increasing dissatisfaction among patients, and both growing resentment and lowering morale among doctors. As estimated by the chief of the township health centre, approximately 10% of patients went to private pharmacies directly after they obtained prescriptions from their doctors, because they could not find the product they normally used in the essential drug list. Doctors were often scolded by their patients for not meeting their needs (Xiao et al., 2013).

A satisfaction study of 1639 patients from 15 cities in five provinces showed that 66.5% of patients felt that the price of essential medicines was significantly lower and that the economic burden on them was reduced (Fan et al., 2011).

# KEY FACTORS LIKELY TO EXPLAIN REFORM CONSEQUENCES FOR POLICY OBJECTIVES: POSSIBILITY OF A PLAUSIBLE CAUSAL LINK BETWEEN REFORM AND OBSERVED IMPACTS

## 7.1 Macroscopic perspective

### 7.1.1 Political commitment

Implementation of the zero-markup policy has involved strong political commitment to coordinate the various Government departments in a cooperative partnership. Financial resources and parallel policies have also been well arranged for and executed. This political commitment has guaranteed the wide implementation of the zero-markup policy at different stages.

The central Government has announced quite a precise timetable requiring progress in the implementation of the NEMP and the zero-markup policy. Meanwhile, the Ministry of Finance, the Ministry of Health, the Ministry of Human Resources and Social Security, and other related departments have also worked closely with each other to design, develop, and implement the compensation mechanism.

### 7.1.2 Synergetic reform with other parts of the health system

The core of the zero-markup system lies in replacing the current economic incentives between prescription and health-service delivery with a more comprehensive compensation mechanism on the basis of performance. A performance-assessment system and a bidding and procurement system should also be adapted to the zero-markup policy. Some positive impact of the policy has been observed, but negative impact has also appeared.

Essential medicines with zero markup are usually cheaper than others. But the process of selecting and listing medicines is demanding, and evidence-based decisions are recommended for the sound implementation of the NEMP. To guide effectively the rational use of medicines, neither too many nor too few species of medicines should be included on the national essential medicines list. An overly long list can be expected to go against the nature of “essential”, which means the medicines may be either of low cost-effectiveness or even no longer used in the market, and is thus less likely to achieve the desired effects. On the other hand, too short a list may severely limit a physician’s prescription capacity in primary-healthcare institutions, and would probably lead to suboptimal delivery of the quality of medical services.

Problems remain for the current list to satisfy the needs of primary health services. For instance, some medicines with high effectiveness are excluded, and treatment for some specific indications or diseases is reported to be restricted by the list. These factors contribute to increases in patients’ economic burden, because they now have to go to secondary or tertiary hospitals, where the zero-markup policy has not been implemented, to obtain medicines which are not listed.

Consistency of the essential medicines list with the health-insurance reimbursement list should also be emphasized. Supplementary lists are maintained separately to better satisfy local needs for essential medicines, and the impact of the combination of national and local supplementary lists with health-insurance reimbursement lists should be assessed.

In the overall context, medical professionals’ understanding and acceptance of the zero-markup policy tends to strongly influence the rational use of and patients’ access to medicines. When medical institutions refocus from profit-driven interests to public welfare as a result of Government commitment, with corresponding

feasible compensation alternatives, the same level of importance would be expected to be attached to both public-health services and clinical diagnosis and treatment.

Together with the regulations on the use of essential medicines, physicians must change prescribing behaviours and explain in greater detail to patients if alternative medicines are recommended. This practice does, to some extent, increase the workload of doctors, and so much more training should be provided to doctors to familiarize them with the essential medicines list so that they make judgements with better understanding when prescribing. Meanwhile, patients have the right to decide whether to take the alternative medicines or to purchase preferred drugs in retail drugstores or other non-Government-owned primary, secondary, or tertiary hospitals where the zero-markup policy has not yet been applied.

The highest priority for drug manufacturers is for their product to be listed, in order to keep or expand their market share. They also tend to participate in bidding associated with drug procurement. Unfortunately, however, it has been observed that fierce price competition sometimes leads to shortage of specific medicines. More specifically, manufacturers may begin with an unrealistically low price to secure bidding outcomes, but after being selected as the recognized wholesalers they are not allowed to restore their original prices. The more drugs sold, the heavier the economic losses they suffer.

Accordingly, manufacturers would prefer not to sell the drug in order to prevent major financial losses but then, in turn, the drug supply could not be guaranteed. It is indicated in this case that the establishment of a sustainable pharmaceutical production, supply, and utilization system is crucial in the long term.

## 7.2 Operational perspective

### 7.2.1 Autonomy of decision and flexibility in public budget management

Only policy measures adjusted to local conditions could ensure the nationwide implementation of the zero-markup policy. Differences are ubiquitous among Chinese local areas, in their range of medical-service conditions, economic development, preference of prescription drugs from both providers and patients, and so on.

A series of changes at the provincial level have proved to be much more acceptable to residents and medical workers, as well as to medical institutions. For instance, optimal compensation policies accompanying the zero-markup policy have been explored, in order to adapt to the local situation. Cities with high economic levels are usually powerful and self-sufficient in making innovations during medical reform, while those with low economic levels have to depend on financial assistance and support from higher levels of government.

It is surprising to note that rather than those poorest areas, the intermediately-developed areas may face the strongest obstacles. These obstacles arise from either inadequate political attention or subsidies from the central Government and a lack of power or financial capability to support the reform on their own.

In addition, many provincial governments have established their supplementary essential medicines lists according to the local development of health insurance schemes and preferences in drug prescription. During the transition period, the requirements for equipment and utilization of essential medicines vary from place to place and between primary and non-primary medical institutions.

### 7.2.2 Financial security and economic incentive mechanism

A rapid development of healthcare facilities occurred over the past three decades and large-scale tertiary public hospitals were expanded. However, the Government subsidy failed to grow as fast as did the expansion of these medical institutions. The Government subsidy shrank sharply, from 60% of revenues in public hospitals in the early 1980s to 24.73% by 2008 (China National Health Economics Institute, 2009). Almost all Chinese hospitals have tried to sell expensive medicines to patients in order to generate more profits from the drug markup.

Under the zero-markup policy, there is no incentive for physicians to prescribe expensive or excessively dosed medicines. It might be helpful to separate medicine sales from medical service provision, and thus no profits

would be generated from selling medicines. However, hospitals would suffer great economic losses, which might even jeopardize their daily operation, and so more support and funds should be provided by the Government to ensure the proper development of health facilities and the salaries of health professionals. A fixed prescription fee could also be used, which would be beneficial to reduce the long-term pressure on Government finances and ensure the revenue of hospitals. At the same time, the work of medical professionals would be valued and respected.

Adjusting the price of medical services has a further impact on incentives. The price of medical services should reflect the expertise and true values of professionals; otherwise low work morale, as well as low quality and efficiency of health-service delivery would result. The situation whereby the more social responsibility a healthcare institution takes, the more economic loss it bears, should be avoided. Otherwise, everyone working in the health system would receive the same amount no matter how much service he/she provides.

### **7.2.3 Management capacity, monitoring and evaluation, and information systems**

The zero-markup policy places more demands upon management capacity. Health providers need to operate without markup on medicines. Meanwhile, they need to improve the quality of their services in order to attract more patients. Although economic incentives between service delivery and prescriptions were abolished, monitoring and evaluation of prescription behaviour is necessary. Monitoring the allocation and utilization of essential medicines, as well as their retail prices, may further promote implementation of the zero-markup policy. With the help of information systems, prescription behaviour can be monitored and evaluated to support comprehensive performance assessment. Additionally, the storage of medicines in each hospital can contribute to the efficient management of the procurement process.

### **7.2.4 An adaptive process over time**

Implementation of the zero-markup policy involved many stakeholders in the whole process and had a close relationship with the essential medicines list, income distribution, bidding procurement system, and so on. It can be foreseen that the complete implementation of the zero-markup policy will be a long process. With the development of economics and technology, and more importantly, the growing demands of patients and the reaction of health providers, the zero-markup policy should make proper adjustments when necessary.

## POLICY IMPLICATIONS AND POSSIBLE LESSONS FOR OTHER COUNTRIES FROM CHINA'S REFORM EXPERIENCE

### 8.1 Economic incentives for efficiency improvement

Even though it is mandatory to implement zero markup, well-designed economic incentives and performance-based assessment mechanisms will provide better support. In most areas, compensation for the zero-markup policy is based on clinical performance.

It has long been the tradition that the majority of hospitals' revenue comes from drug sales. For some hospitals with poor financial situations, it is even difficult to provide sufficient income for health professionals. Once the basic wage and benefits of health professionals are guaranteed, and health institutions stop relying on medicines revenue after the reform, health facilities can develop in a proper manner.

However, as long as there is a lack of sufficient or appropriate funding, the efficiency and quality of health services delivered will be diminished. Many influential factors could negatively affect the financial support for institutions. A heavy financial burden on local governments is common in this situation, and the responsibilities encountered among various levels of government are ambiguous. All these factors might lead to insufficient compensation to institutions – an issue which urgently requires resolution to ensure long-term development.

The guaranteed basic salary would provide a safety net for health professionals. But work efficiency would not be greatly improved if everyone received the same income no matter what they did. Accordingly, a well-designed performance-based payment mechanism should be established to promote improvements in the quality of medical services and work efficiency. However, the performance-based payment mechanism has not currently been well developed in China. More observations on the quality of services and healthcare behaviours are necessary to build up a proper indicator system.

In addition, more attention should be devoted to both clinical treatment and public-health services. Thereby, income level would be associated not only with the quantity but also the quality of the services provided.

### 8.2 Tradeoff among policy objectives

Physicians, patients, health insurance authorities, drug manufacturers, distribution companies, and others are involved as stakeholders in the zero-markup policy. Policy-makers should balance the benefits and losses of various stakeholders, such as establishing an essential medicines list to ensure patients' access to medicines, giving compensation to make up hospital revenue loss and forming an incentive mechanism to improve the efficiency of medical professionals.

They must understand the goals and benefits of the zero-markup policy and take positive actions towards its implementation. The zero-markup policy and essential medicines list are adopted to improve efficiency and equity in the pharmaceuticals sector, which must be balanced with other policy objectives such as patient selection and satisfaction, as well as quality of care.

# FUTURE PLANS FOR CHINA'S HEALTH REFORM IN THE AREA OF DRUGS POLICY

## 9.1 Emphasis on the rational use of medicines

### 9.1.1 The formulation and adjustment of the essential medicines list should be based on evidence

In order to make the essential medicines list more widely accepted, procedures for the selection of essential medicines and the adjustment mechanism should be based on more evidence, instead of the current mode which relies mainly on expert opinions. Pharmacoeconomics or health technology assessment may play an increasingly important role, in which efficacy, safety and cost-effectiveness of drugs would be evaluated as important evidence. An information system is also needed to integrate and take advantage of the information about medicines from different resources across the country.

Provincial supplementary lists extend the national essential drugs list. Great differences exist among healthcare supplies and needs in different areas. Thus, supplementary lists have such positive effects as enriching the drugs available at the primary level. The formulation of such lists should also be based on standard procedures and principles. Comments and suggestions from primary hospitals and medical professionals are important in determining the essential medicines list, which should satisfy the criteria of the most commonly used and the most effective. Consistent with social economic development and disease pattern changes, the essential medicines list should be updated regularly.

### 9.1.2 Additional emphasis upon the rational use of medicines

In the first stage, the frameworks of the zero-markup policy and parallel policies have been established. In the next stage, focus would be placed on how to guide the rational use of medicines with the help of the national essential medicines list. This is a comprehensive task that involves clinical practice, economic incentives and other influential factors, and notable effects should only be expected over the long term.

More training and education programmes for medical professionals should be conducted to help them form proper prescription behaviours, so that the irrational use of medicine by providers would be gradually eliminated. Economic incentive mechanisms are also helpful in creating a healthy environment for the rational use of medicines. Meanwhile, the understanding of the general public should not be ignored, as it will establish a better relationship between patients and providers. Moreover, supervision by patients can contribute to the elimination of the irrational use of medicines.

## 9.2 Tradeoff among efficiency, equity of access, and quality

### 9.2.1 Orientation towards public interest and satisfaction

The design and implementation of the zero-markup policy should be oriented towards public interest and satisfaction. Patients' access to essential medicines must be guaranteed. As essential medicines are reimbursed by health-insurance schemes, there is a strong willingness to narrow the gaps in benefit packages between the employed and unemployed, in urban and rural areas. If conditions permit, local supplementary medicine lists can be used to meet the increased needs of health services.

### 9.2.2 Promotion of overall implementation in institutions at various levels

Medicine policies are now mainly implemented in public primary-healthcare institutions. Accordingly, decreases in outpatient costs occurred more frequently at the primary level. Medical costs are still high in non-primary hospitals. To avoid the flow of patients to non-primary hospitals and reduce inequity among the various levels of hospital, the NEMP should be implemented in all hospitals as planned. Moreover, it is expected that patients will be able to access essential medicines of high quality at suitable prices anywhere.

# 10

## CONCLUSION

The zero-markup policy has now been widely implemented in China, with decentralization of health-facility compensation modes, provincial supplementary essential medicines lists, and procurement and reimbursement arrangements at the provincial level to satisfy different situations among regions. The utilization of essential medicines has increased, but the impact on the rational use of medicines and a decrease in medical expenditure has not yet been well evidenced. Performance-based compensation mechanisms for healthcare facilities should be further developed, and more emphasis should be placed upon the rational use of medicines in the future.

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