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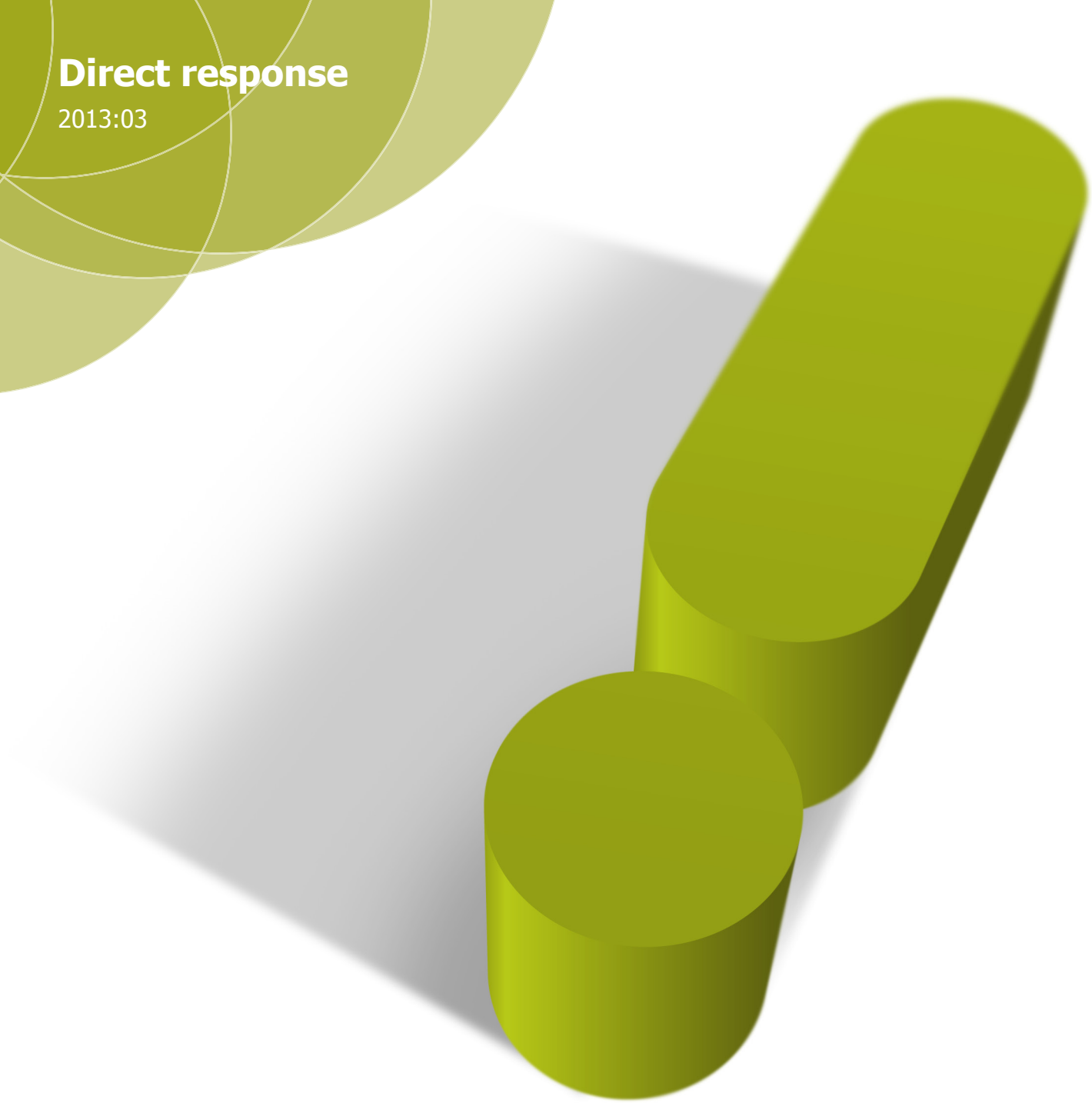

China's Healthcare System
– Overview and Quality Improvements

China's healthcare system has undergone considerable changes over the past couple of decades and continues to face mounting challenges. This country report is focused on the development of China's healthcare reform, including measurement of both quality and performance of the healthcare system. The report is part of the Swedish Agency for Growth Policy Analysis' Health Measurement Project, which examines quality measurements for healthcare in a number of countries.

growth analysis

Reg. no. 2013/012
Swedish Agency for Growth Policy Analysis
Studentplan 3, SE-831 40 Östersund, Sweden
Telephone: +46 (0)10 447 44 00
Fax: +46 (0)10 447 44 01
E-mail: info@growthanalysis.se
www.growthanalysis.se

For further information, please contact Christer Ljungwall
Telephone: +86 (0)10 6532 6480
E-mail:christer.ljungwall@growthanalysis.se

Foreword

This country report is focused on the development of China's healthcare reform, including measurement of both quality and performance of the healthcare system. It is part of the Growth Analysis Health Measurement Project, which examines quality measurements for healthcare in a number of countries. The project was commissioned by the Swedish Ministry of Health and Social Affairs.

This country report has been written by Shanlian Hu, MD. MSc. Professor at School of Public Health, Fudan University Shanghai, Health Development and Research Center Shanghai Bureau of Health; and Dr. Christer Ljungwall, Science Counselor, Swedish Agency for Growth Policy Analysis, Office of Science and Innovation, Beijing. Dr. Martin Wikström was the project leader for the multinational study.

Stockholm, April, 2013

Enrico Deiaco, Director and Head of Division, Innovation and Global Meeting Places

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Summary

In recent years, China's GDP growth rate has on average exceeded 9 percent annually. As a result, the country's standard of living has improved, fueling residents' demand for more sophisticated healthcare services. This, in combination with strong needs for better and more inclusive healthcare, has led China to embark on a major healthcare reform program, with the goals of establishing a universal health security system. The new system is not just a healthcare system and recognizes the impact of the environment, lifestyle and socio-economic circumstances on health. Ultimately, the government plan to provide basic healthcare for all its citizens by 2020. This report examines a range of topics, including insurance systems currently in place in China, hospital reforms, how healthcare is financed, maintaining quality of care and how these various indices should be measured.

The major components of China's healthcare reform plan include; the expansion of basic medical insurance programs and creation of a rural co-operative medical system that already today enroll more than 90 percent of urban and rural residents; establishing a national essential drug system that encompasses drug selection, production and supply, clinical applications, and medical insurance reimbursement; establishing a competent, primary medical care service infrastructure composed of rural township centers, village clinics and urban community healthcare centers, including a dual-direction referral system between community healthcare institutions and hospitals and, finally; equal access to basic public health services by both urban and rural residents.

Pervading all of this are the roles of both public and private institutions and how this balance is to be maintained as China continues to build its healthcare system. The government is encouraging private capital to invest in the construction of new hospitals and other care facilities and there is a robust combination of public and commercial insurance schemes for people to choose from.

Emphasis has also been put on improving care at all levels of the system by addressing various problems such as abuse of antibiotics and intravenous drugs, drug quality and safety as well as hospital accreditation.

The government and healthcare organizations have set up quality registries and mechanisms to evaluate a range of issues, from quality and safety to efficiency and performance, laying the groundwork for a more solid healthcare infrastructure in the future.

Sammanfattning

Kinas hälso- och sjukvårdssystem har genomgått stora förändringar under de senaste två decennierna och står inför ännu större utmaningar i takt med att samhället och de sociala och administrativa systemen förändras och växer. Den här rapporten behandlar en rad områden, bland annat de försäkringssystem som finns i Kina idag, sjukhusreformer, finansiering av vården, vårdkvalitet och hur dessa olika indikatorer ska mätas.

Alla dessa områden präglas av ansvarsfördelningen mellan offentliga och privata institutioner och vidmakthållandet av denna balans medan Kina fortsätter utveckla hälso- och sjukvårdssystemet. Regeringen uppmuntrar privata aktörer att investera när nya sjukhus och andra vårdinrättningar ska byggas, och det finns en stark kombination av offentliga och privata sjukförsäkringsalternativ att välja mellan.

Man har också lagt vikt vid att förbättra vården på alla nivåer i systemet genom att angripa olika problem, till exempel överanvändningen av antibiotika och intravenösa läkemedel, läkemedelskvaliteten och ackrediteringen av sjukhus. Regeringen och vårdorganisationer har inrättat kvalitetsregister och mekanismer för att utvärdera en rad frågor som rör såväl kvalitet och säkerhet som effektivitet och prestation. På detta sätt vill man bygga en grund för en stabilare hälso- och sjukvårdsinfrastruktur i framtiden.

1 Overview of China's Health System

1.1 Government regulation and administration

The healthcare system in China is under the leadership of National Health and Family Planning Commission[1], but healthcare governance has been decentralized among Bureaus of Health in 31 provinces/autonomous regions. This segmentation in China's healthcare system is further exacerbated by the fact that overall healthcare system reform is under the State Council Healthcare Reform Leadership Committee while other ministries carry out healthcare system development and reform using a multi-sector approach and issuing important healthcare reform guidelines and documents. These include the National Development & Reform Commission (NDRC), Ministry of Finance (MOF), Ministry of Human Resource & Social Security (MOLSS), Ministry of Civil Affairs (MCA) and Ministry of Commence (MOC). The roles of each stakeholder and their responsibilities are shown in Table 1.

Stakeholder	Function and Responsibility
National Development & Reform Commission *inc. Price Bureau*	Monitoring and evaluation of healthcare system reform; setting the price of drugs and medical services.
Ministry of Finance	Financial support and investment in healthcare as well as subsidies for health insurance and to ensure zero mark-ups for essential medicines.
Ministry of Health *inc. State Food and Drug Administration and Bureau of Traditional Medicine*	Operation of rural medical cooperatives; public hospital reforms; essential medicine policy; bidding and procurement of drugs and medical equipment; rational use of medicine; public health services; supervision of food and drug safety/quality.
Ministry of Human Resources & Social Security	Management of medical insurance for urban employees and residents; reform of drug reimbursement & payment systems.
Ministry of Civil Affairs	Poverty alleviation; medical aid for the poor.
Ministry of Commence	Drug wholesale and retail; pharmacy administration; distribution of medicines & medical equipment.

Table 1. Roles of different stakeholders and their responsibilities in China

Source: Ministry of Health, 2012.

1.2 Efforts to reform China's healthcare system

In April 2009, the Central Committee of Chinese Communist Party and the State Council issued a set of guidelines on medical and pharmaceutical system reform together with a notice by the State Council regarding an implementation plan to push reform for the period between 2009 and 2011.

[1] *The former Ministry of Health (MOH) was recently merged with the State Family Planning Commission after the 18th People Congress held in March 2013.*

Five key proposed actions were: (1) acceleration of the establishment of a basic health insurance system; (2) preliminarily establishment of a national essential medicines system; (3) improvement of primary healthcare services; (4) steady improvement of access to fundamental public health services; and (5) further expansion of public hospital services.

1.3 Organization and governance

In general, healthcare in China is administered through three different systems: hospitals, primary healthcare facilities and public health institutions. Statistics show that in 2011, China had a total of 21,979 hospitals including 14,328 general hospitals (65.2%), 2,831 traditional Chinese medicine hospitals (12.9%) and 4,283 special hospitals (19.5%). The majority of hospitals are public (13,539; 61.6%), while the total number of private hospitals stood at 8,440 (38.4%).

The total number of primary healthcare facilities in China in 2011 was 918,003, which included 32,860 urban community health centers (3.6%), 37,295 rural township health centers (4.1%), and 184,287 outpatient clinics (20.1%). However, the vast majority of these facilities were made up of village health posts (662,894), which accounted for 72.2 percent of the total.

The total number of public health institutions was 11,926 in 2011, including 3,484 Centers for Disease Control (29.2%), 1,294 hospitals for special treatment and disease prevention (10.9%), 3,036 maternal and child healthcare centers (25.5%), and 3,022 health supervision institutions (25.3%).

In 2011, the numbers of individuals seeking outpatient treatment trough different facilities was as follows: urban hospitals 204 million (36.8%), community health centers, 48.5 million (8.8%), township health centers 90.1million (16.3%), village health posts 165.7 million (29.9%), clinical outpatient centers 50 million (9.0%). It is worth noting that grassroots facilities accounted for 63.2 percent of all outpatient treatment. On the other hand, the distribution of individuals requiring impatient treatment was completely different. Urban hospitals saw 94.78 million patients (70.6%), rural township health centers 36.8 million (27.4%) and urban community health centers 2.65 million (2.0%).

2 China's Multi-Layered Medical Insurance System

China's Social Insurance Law was formally enacted in July 2011 and includes three basic medical insurance schemes - urban employee basic medical insurance (UEBMI), urban resident basic medical insurance (URBMI) and a reformed version of the rural cooperative medical system (RCMS).

2.1 Urban employee basic medical insurance (UEBMI)

Initial UEBMI reforms were carried out in 1994 in the cities of Zhenjiang in Jiangsu Province and Jiujiang in Jiangxi Province. The State Council published a decision on establishing an urban employee basic medical insurance system that would provide all urban employees with medical insurance funded through a combination of social pooling and individual medical savings. The Social Insurance Law, enforced by the Ministry of Human Resources and Social Security, stipulates that all enterprises and employees must participate in UEBMI.

UEBMI is required for all entities, including enterprises (state-owned, collectively-owned, foreign-invested and private), government agencies, social groups, non-state-owned enterprises and their employees. After these reforms were implemented, the system was expanded to cover all employees from non-public economic organizations, rural workers and informal sectors. Between 2009 and 2011, a total of 45.83 million rural workers along with 8 million retirees and individuals laid off by bankrupt employers received support through UEBMI. In the recent years, the number of individuals joining this scheme has stabilized and growth has slowed. The majority of the premium is pooled at city- or prefectural-level.

Funding for UEMBI comes from a pooled fund and individual medical savings accounts. The premium is collected in the form of a payroll tax, 6 percent of which is provided by employers and 2 percent is contributed by employees. All contributions from employees are put into personal medical savings accounts while employer contributions are divided into two parts with 70 percent placed in a pooled fund and 30 percent placed in the individual employees' personal medical savings account. Taxation levels vary on local economic environments with Shanghai being the highest at 10 percent for employers and 2 percent for employees. However, the contribution is preferable toward the elderly as retirees are not required to pay the 2 percent payroll tax.

An audit conducted in 2011 shows that input into the UEMBI fund totaled RMB 482.1 billion. Premium contributions from employers, employees, government finance and other income respectively constituted 73.02 percent, 20.47 percent, 3.47 percent and 3.04 percent of this total. UEMBI expenditures totaled RMB 389.2 billion and as of the end of 2011, the accumulated surplus was RMB 552.5 billion.

Accounting of the pooled fund and the personal savings accounts are managed separately and the fund itself is mainly used to reimburse the cost of hospitalization. Deductibles average about 3 percent of an employee's annual salary, while the ceiling of coverage is about six times the employee's salary. Varying levels of reimbursement are set between the deductible and ceiling. In 2011, around 79 percent of the fund went to pay for inpatient treatment, while deductibles and outpatient medical costs were paid from personal accounts or out-of-pocket.

2.2 Urban resident basic medical insurance (URBMI)

In 2007, the State Council published an opinion on carrying out pilot studies of an urban resident basic medical insurance scheme (URBMI), which was implemented nationwide in 2009. URBMI is administrated by the Ministry of Human Resource and Social Security.

URBMI covers urban residents that are not covered by UEBMI, including middle and primary school students, children, adolescents, the elderly and other groups requiring social aid (the poor and disabled). According to the statistics published by the Ministry of Human Resources and Social Security, the total participants in this scheme by year were 43 million (2007), 118 million (2008), 182 million (2009), 195 million (2010) and 221 million (2011). Premiums are pooled at the municipal or prefectural level.

Contributions are collected by household with some subsidies coming from the government. Since 2007, government subsidies have increased annually, but individual contributions have not increased significantly, meaning that government subsidies make up over 80 percent of the total fund. In 2011, total inflow into the URBMI fund was RMB 70.13 billion and expenditures totaled RMB 50.31 billion. As of the end of 2011, the total accumulative surplus was RMB 53.94 billion.

Coverage includes only hospitalization and catastrophic illness. As of the end of 2011, the coverage ceiling was set at six times the individual's disposable income. The average threshold was RMB 130,000 and the average percentage reimbursed through URBMI was 70 percent.

2.3 Rural cooperative medical system (RCMS)

In early 2002, the CCCP and the State Council issued a decision on further strengthening rural health care, which resulted in the administration of the rural cooperative medical system (RCMS) being delegated to the Ministry of Health. RCMS is a voluntary system that is organized and directed by government. As of the end of 2011, there were 832 million beneficiaries and the coverage rate was over 95 percent. At present, the contributions are pooled at the county or city level.

Financing is achieved through a combination of individual contributions, financial support from collective enterprises and government subsidies. Over the past three years, both revenue and expenditure within the RCMS have grown considerably. In 2010, the average per capita contributions averaged RMB 150, but by 2011 this number had increased to RMB 250. Similarly, per capita financial subsidies from central and local governments totaled RMB 120 in 2010, increasing to RMB 200 in 2011. However, in both the URMI and RCMS schemes, 80 percent of contributions are supported by central or local governments. Revenues and expenditures for RCMS totaled 197.5 billion and RMB 160.7 billion respectively in 2011, while the total cumulative surplus was RMB 82.4 billion.

Reimbursement is divided into three formats - catastrophic illness insurance (inpatient) + medical saving accounts (outpatient), catastrophic illness insurance (inpatient) + ambulatory fund (outpatient) and catastrophic illness insurance only. Reimbursement levels have already reached 70 percent as of 2011 and the coverage ceiling has increased to six times the net annual income of rural residents.

As of early 2013, 95 percent of rural China is covered by RCMS and government financial subsidies have been increased to an average level of around RMB 340. Reimbursement levels will hopefully increase even further to 75 percent, up 5 percent over previous levels.

Maximum coverage will not fall below a minimum of RMB 80,000, while reimbursement for ambulatory visits will also increase and further decrease out-of-pocket payments.

At the provincial level, insurance for catastrophic illnesses should be fully implemented in 2013. This insurance will cover twenty major illnesses, including childhood leukemia, phenylketonuria and hypospadias. In order to make the catastrophic insurance scheme feasible, the Chinese government will encourage the participation of commercial insurance providers in the management of rural cooperative medical services. A variety of payment system reforms will be carried out to effectively control medical costs and enhance available benefits. Increased supervision of the RCMS fund will also be required. Convenient services such as preventative care and post-treatment billing, as well as reimbursements at the hospital or clinic will also be piloted.

2.4 Major administrative issues in basic medical insurance schemes

Currently, there is significant fragmentation in the administration of medical insurance in urban and rural areas. UEBMI and URBMI are managed by the Ministry of Human Resources and Social Security, while RCMS is implemented by the Ministry of Health. This creates issues that will have to be solved in the future. These are described in detail below.

(1) Redundant input and waste of resources

With UEBMI and URBMI under the Ministry of Human Resources and Social Security, and RMCS under the Ministry of Health, considerable amounts of tax payer money is spent on construction of facilities, information sharing systems and staffing. Information on insured individuals in the different systems is never shared each other and some people take part in both urban and rural schemes, which increasing the burden on both the government and the family. A report by the Central Auditing Bureau in 2011 shows that 5.47 million people take part in both resident medical insurance schemes, forcing the government to spend an additional RMB 923 million in subsidies. This also puts additional burdens on the system, which has to process multiple reimbursement claims for both schemes.

(2) Inability to meet the requirements of harmonious development in urban and rural areas

The present structure of basic medical insurance schemes is based on the current makeup of China's population, i.e., urban residents, corporate employees or farmers. Administration, financial management and entitlement to benefits all differ between these schemes and there is no mutual access to care across schemes in different localities.

(3) Difficulties in supervision and monitoring.

Basic medical insurance plays a significant role in the payment of healthcare costs. Its development and reform will impact the development of both individual hospitals and healthcare services in general.

The central government has long emphasized the importance of merging urban and rural medical insurance schemes. In early 2009, opinions on deepening healthcare system reform[2] advocated "the effective integration of basic medical insurance resource to gradually unify administration of between urban and rural basic medical insurance schemes". In 2012, the Twelfth Five-Year Plan also refocused efforts on merging the administration of

[2] *CCCP & State Council: The Opinion of Deepening Heath Care System Reform. China Issue No. 6, 2009.*

URBMI and RCMS, including the reorganization of functions, resources and mechanisms.[3] Recently, the 18th CPCC Conference Bulletin insisted that social security systems in urban and rural China should be based on a principle of universal coverage, equity, providing basic/catastrophic health services as well as transferability and sustainability".

The current structure of China health insurance system is based on a combination of the aforementioned types of basic medical insurance systems with supplementary systems and safety nets, including civil servant subsidies, supplemental company insurance, target-group insurance schemes (Red Cross school children and adolescent insurance, union member benefits, etc.), and private medical insurance (Figure 1).

Private medical insurance has expanded rapidly in China since 2000. In 2010, about 7 percent of the population was covered under private insurance and paid total premiums were of RMB 67.7 billion RMB (Figure 2).

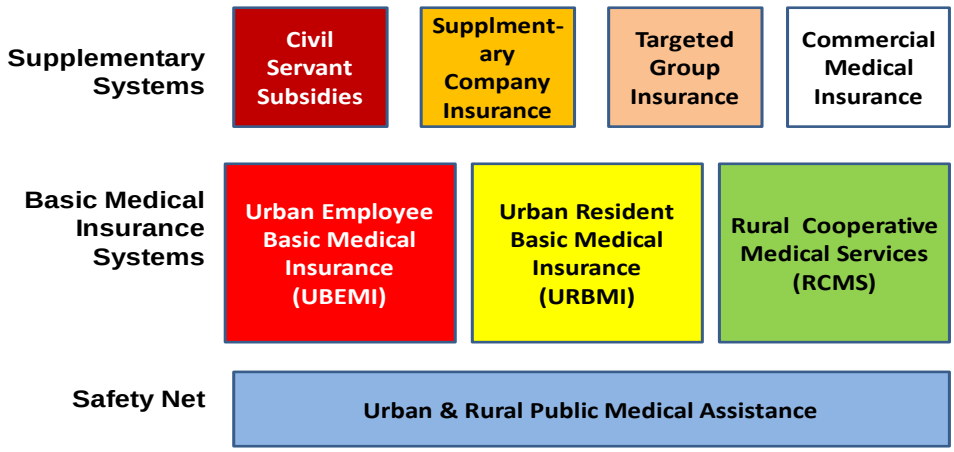

Figure 1. China's multi-layered medical system

Source: The authors

[3] *State Council: Deepening Healthcare System Reform in the Twelfth-Five Year Plan and Its Implementation Program. China Issue No. 11, 2012.*

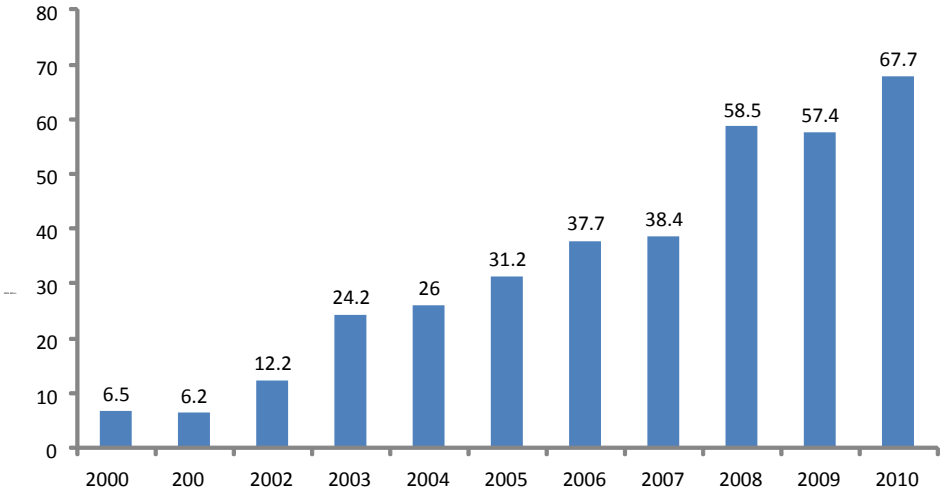

Figure 2: Private health insurance premiums in China 2000–2010

Source: China Insurance Regulatory Commission

As of December 2011, 473.4 million individuals have enrolled in UEBMI and URBMI, while RCMS beneficiaries total 835 million. The combined total of 1.31 billion means that total coverage has reached nearly 95 percent of China's population. The average contribution levels in different medical insurance schemes are given in Table 2.

Medical Insurance Scheme	Average contribution per capita per year in 2011 (RMB)
Urban Employee Basic Medical Insurance	1,960
Urban Resident Basic Medical Insurance	268
Rural Co-operative Medical System	250

Table 2. Average contribution levels in different medical insurance schemes

Source: China Insurance Regulatory Commission, 2012.

While comprehensive coverage is offered through the three basic medical insurance schemes (UEMI, URMI, RCMS), many problems remain, including insufficient reimbursements as well as the burden on individuals to pay up front, which is especially common in secondary and tertiary hospitals.

Problems with the current medical insurance schemes are closely linked to regional problems such as management, financing inequality and social security. Also, as contributions are concentrated at the local level, over 150 million rural residents that have migrated to urban areas are unable to transfer their coverage, which means that any medical services provided outside the individual's original locality will not be reimbursed.

Another issue is sustainability in the context of an aging population. The government has encouraged the development of private insurance's role in the administration of public insurance schemes or designating private insurance to cover catastrophic illnesses. Supervision of these roles and their implementation has yet to be given sufficient attention. This is not to mention the fragmentation that exists among the three basic medical insurance schemes.

3 Public Hospital Reform

There are currently 17 cities in China carrying out public hospital reforms, including the megacities of Beijing and Shanghai. During the current 12th Five-Year Plan (2011-2015), pilot studies will be conducted at 600 county-level public hospitals as part of the first step of a comprehensive reform project. The current drug margin policy will be eliminated in all county hospitals by 2013. The hospital reimbursement will be guaranteed through three channels, namely adjustment of health service prices, payouts from medical insurance and government subsidies. Adjustments to the payment scheme will also include case payment, general budget controls, capitation, contracting and negotiation. The government will support hospital information system development, establish key clinical specialties; promote hospital construction and investment in new equipment. Meanwhile, public hospitals will be charged with ensuring efficiency, quality and cost control through improvements in internal management, implementing policies like cost analysis, human resource management and pay-for-performance.

There are a number of goals, changes and tasks that have been outlined in the reform of public hospitals. The ultimate aim of ensuring universal access to basic health services is based in the principle of establishing a system of medical services that is based on non-profit model that is supplemented by non-public medical institutions. Increased government action is also key in improving and developing a three-tier health network and improving basic health insurance services.

The Chinese government is focusing on ensuring basic security, strengthening grass-roots organizations and putting specific mechanisms in place that support a reform of public hospitals at the county level, enabling them to provide basic medical services. The biggest issue at this point is how to eliminate drug markups as a key source of income for these hospitals.

Key changes that will be made include a transition from scale to quality and efficiency in terms of development, a focus on detailed information management and changing hospital facilities to better support medical staff. Improving the living conditions of staff that live in-hospital will make employees more enthusiastic and hospitals more efficient and improve the quality of healthcare services.

To strengthen medical services management and ensure the quality and safety of medical care, the Ministry of Health has implemented a step-by-step program to create 100 High-Quality National Hospitals, 300 High-Quality Regional Hospitals and 500 High-Quality County Hospitals.

At present, a number of pilot alliances have been formed between regional hospitals in Shanghai, Beijing, Wuhan and Shenzhen with the goal of integrating regional healthcare resources. This vertical integration is combined with cooperation between primary healthcare institutions as well as secondary and tertiary hospitals to form a multi-hospital system. The initial concept is to allow patients access to all care centers in the alliance with the primary healthcare institution (community health center) as the first point of contact. If further care is needed, the patient can then be referred to a secondary or tertiary hospital for necessary treatment. During the recovery period, the patient can return to the community health center for rehabilitation. Hospital alliances allow for seamless medical care and increased efficiency in the healthcare system.

Hospital alliances are one type of reform being tried in public hospitals, but it will require continued improvement and will not be perfected in the short term. This type of reform

will require changes both internally and externally. Currently, hospital integration has only been achieved at the administrative level, which is not true vertical integration. It does not deal with fundamental issues or face substantial risks. The future of hospital alliances should focus on the integration of finances and resources, but this will require both policy and legislative support from the government.

Box 1. Establishing a medical alliance to promote the integration of regional medical services

Chaoyang Hospital in Beijing is an example of how reforms in public hospitals have been successful. In November 2012, the Chaoyang Hospital Medical Alliance was formed to integrate medical services in Beijing by linking two tertiary hospitals, two secondary hospitals and seven primary healthcare institutions with a total of 3,100 beds.

The first step was to begin integration of resources within the region. Each institution was given a clear function within the alliance to create a management hierarchy. Management Committee Office serves to strengthen and unify management and coordination and is staffed by directors of member institutions. Functions have the various hospitals in the alliance have been clearly defined with Chaoyang Hospital providing diagnosis and treatment of severe diseases as well as specialized medical equipment. Secondary hospitals carry out diagnosis and treatment of complex diseases and common illnesses with conventional methods. Community health centers, meanwhile, take charge of clinical and chronic disease management, conventional treatment and rehabilitation.

The alliance has also created a "green channel" to make healthcare services more accessible. The two-way referral green channel helps patients transfer between different medical institutions based on their needs. Hospitals can shorten the time an average patient spends in the hospital and quickly transfer acute and severe patients to tertiary hospitals. Meanwhile, patients with common or chronic diseases, as well as those requiring rehabilitation can be transferred to local level facilities.

Special laboratory and pathological testing as well as CT and MRI scans at Chaoyang Hospital are shared within the alliance and member institutions are given priority access. Hospitals also cooperate to improve diagnosis and treatment in community health centers. Chaoyang Hospital has created a unified medical information system that allows for video consultation, allowing patients to be diagnosed and even treated by doctors at tertiary hospitals without even having to leave home. Doctors from Chaoyang Hospital also regularly visit community health centers to provide consultation and training for general practitioners at that level.

4 Private Hospital Development

In late 2010, the NDRC, MOH, MOF, MOC and MOHRSS jointly announced a joint-opinion on "further encouraging private capital investment in medical institutions". This will require policies and guidelines at the provincial level that eliminate barriers to private hospitals entering into and operating within these markets, meanwhile, ensuring that private hospitals provide the same level of care as public hospitals. Private hospitals should have equal access to patients covered by medical insurance, government grants, independent personal enrollment, and continued staff training, supervision and management. A revised and improved taxation policy for non-profit and for-profit private hospitals should also be put into place. Privatization of some public hospitals should also be allowed.

The government has put special emphasis on encouraging private capital to invest in non-profit private hospitals with a total of 14 provinces/municipalities developing special policies in this area. Yunnan, Chongqing and Hebei currently lead the way, while Beijing, Tianjin and other 10 provinces are still in the process of approving relevant policies. Shanghai, Heilongjiang, and other four provinces are still at the development stage.

Liaoning Province is currently working to increase the number of private hospitals to comprise 45 percent of all hospitals by 2015. Chongqing will make efforts over the next five years to increase the number private hospitals and the overall number of beds by 40 percent and 20 percent respectively. To deal with a lack of skilled personnel, Yunnan Province is allowing doctors from public hospitals, as well as retired doctors, to practice in private hospitals without any impact on their remuneration. Yunnan allocates RMB 20 million annually for to support the building of private hospitals. Meanwhile, Hubei Province has been encouraging foreign investment in hospitals and Zhejiang Province has created a special program that subsidizes private investors that invest in hospitals, streamlining the approval process.

Henan Province has provided tax benefits for private hospitals, waiving all taxes for the first five years and a 50 percent local tax refund thereafter. Private hospitals first appeared in Shanghai in 2007 and the city currently has 1,311 private medical institutions, 1,250 are for-profit (95.3%) and 61 are non-profit (4.7%).

Several issues in hospital development today are that the criteria of entry market are too low, management practices are not standardized (accreditation etc.), tax burdens are too high (~5.5% business tax and 25% income tax) and limitations on the use of public medical insurance schemes.

China's healthcare system is significantly fragmented and some functions need to be merged. Services are mostly provided by the government or state-owned organizations, but is still very profit oriented. More emphasis should be put on innovation in the healthcare system and its operation.

Box 2. Targets for developing a "medical industry" in Shanghai and Beijing

The Shanghai government has developed the Pudong and Hongqiao International Medical Service Areas with the goal of creating 100 nursing homes with 10,000 beds as well as 50 joint venture hospitals, which have more than 1,500 beds, and 200 private hospitals and 500 private clinics by the year 2015. 20% of Shanghai residents are expected to purchase some sort of commercial medical insurance.

As of 2011, there were about 4,500 private medical institutions, accounting for about 49% of all medical institutions. The total number of beds and clinical visits is accounted about 27% and 22%, respectively. Beijing also encourages private investment in nursing homes, rehabilitation, traditional Chinese medicine or facilities that combine traditional and Western medicine.

5 Healthcare Financing

China has maintained accounting records for national healthcare expenditures since 1978. In 2011, national healthcare expenditures totaled RMB 24.34 trillion ($376.94 billion USD).4 The share of total health expenditure as a part of China's gross domestic product (GDP) was 5.15 percent and per capita expenses were RMB 1,807 ($279.7 USD). Although pharmaceutical expenditures have declined in recent years, they remain a major portion of healthcare spending, making up 38.89 percent of all spending on healthcare and reaching RMB 702.71 ($108.7 USD) per capita.

Major changes in the composition of national healthcare expenditures occurred between 1990 and 2011. In the early 1990s, government input was about 25 percent, while private contributions (mainly private medical insurance) contributed around 40 percent and individual out-of-pocket contribution made up roughly 35 percent. However, marketization of healthcare services in the mid-2000s meant that out-of-pocket payments reached as high as 60 percent in 2002 before the SARS outbreak in China. Afterwards, the government put increased emphasis on healthcare equality and the development of a social security system. This has been especially true in the three years between 2009 and 2011 with government input increasing to 30.4 percent, private insurance contributions increasing to 34.7 percent and individual out-of-pocket payments falling to 34.9 percent in 2011, (Figure 3)

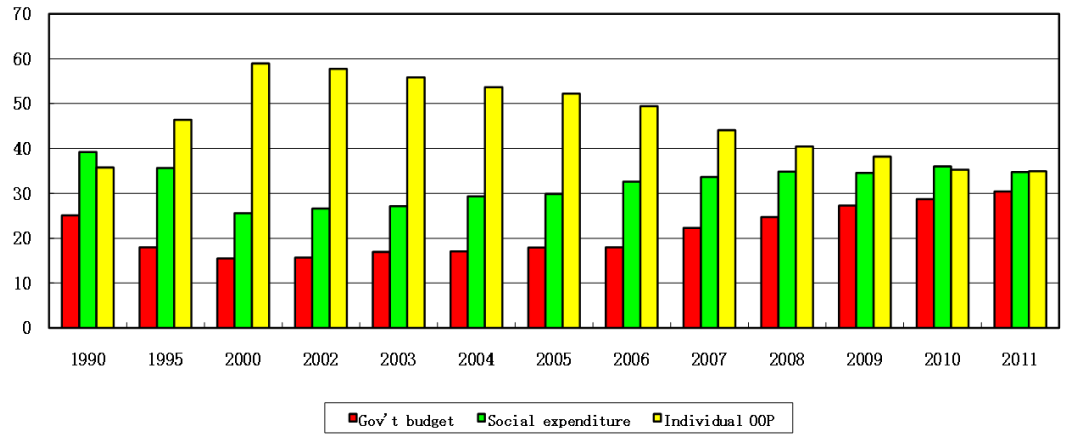

Figure 3. Composition of national healthcare payouts in China, 1990–2011

Source: China National Accounts, 2012.

The dramatic decline in out-of-pocket spending on healthcare from 57.7 percent in 2002 to 34.8 percent in 2011 is a clear sign that improvements are being made in redistributing the burden of healthcare costs in China.

Total government expenditure was RMB 746.2 billion, accounting for 6.83 percent of total financial expenditures and 1.58 percent of GDP. In terms of international classification, total private out-of-pocket spending on healthcare totaled RMB 1.07 trillion, including

[4] *2012 China National Health Accounts Report. China National Health Development Research Center.*

RMB 69.2 billion from private commercial insurance and RMB 846.5 billion in cash payments.

Based on the total health expenditures by providers in 2011, 62 percent went to hospitals, which had total expenditures of RMB 1.56 trillion. The balance of expenditures and revenue for Chinese hospitals in 2011 is shown in Table 3.

	Revenue (billion RMB)		**Expenditures (billion RMB)**		**Surplus (billion RMB)**
Government financial subsidies	1074	9.8%	4.73	4.5%	6.00
Medical service	53.68	48.7%	59.38	55.8%	-5.70
Pharmaceuticals	44.07	40.0%	41.41	38.9%	2.65
Others	1.70	1.5%	0.84	0.8%	0.84
Total	110.19	100%	106.38	100.0%	3.80

Table 3. Total revenue and expenditures for Chinese hospitals in 2011

Source: Department of Planning and Finance, MOH 2012.

Of note here is that there was a RMB 5.70 billion deficit in expenses for medical services and the ultimate surplus mainly comes from financial subsidies (RMB 6.00 billion) and drug sales (RMB 2.65 billion). This clearly shows that fees charged for medical services are too low to cover actual costs. However, the zero-markup policy for essential medicines was not implemented in secondary and tertiary hospitals in China in 2011, which meant that there was still a surplus in revenue from this area. After this revenue disappears because of public hospital reforms, hospitals will require more financial support from the government and insurance providers.

6 Healthcare Services and Health Status in China

Significant improvements have been made in healthcare services despite China's large population and extensive coverage needs. In 2011, there were 6.27 billion clinic visits in China with an average of 4.6 visits per person per year. The number of hospitalizations was about 150 million, or 11.3 admissions per 100 persons. Occupancy rates for hospital beds were 88.5 percent and the average length of a hospital stay was 10.3 days.

The State Council published a white paper on the status of healthcare in China at the end of 2012, which found that the overall health of Chinese people remains ahead of other developing countries. The life expectancy at birth was 74.8 years in 2010 with male and female life expectancy at 72.4 and 77.4 years respectively. The infant mortality rate was 12.1‰ and the maternal mortality rate was 26.1 per 100,000 in 2011. The child mortality rate for children under 5 years old was 15.6‰. China has achieved United Nations Millennium Development Goals in this area ahead of schedule. It is also illustrated that the health status of Chinese residents has been constantly improving, (Table 4).

Health Indicators	**2002**	**2011**
Life expectancy at birth (Year)	-	74.8
Infant mortality rate (‰)	29.2	12.1
Maternal mortality rate (per 100,000)	51.3	26.1
Child mortality rate under 5 years old (‰)	34.9	15.6

Table 4. The change of major health indicators in China

Source: State Council. "White Paper on Medical Services and Healthcare in China", 2012.

7 Improving the Quality of Healthcare in China

Part of the reforms to China's healthcare system is improving quality of care. In 2009, the Chinese government announced a policy on deepening medical and pharmaceutical system reforms, focusing on public hospital reform by streamlining internal management, improving medical services, standardizing doctor behavior and improving the quality and efficiency of medical service.[5]

Quality of care is one of the intermediate indicators in the evaluation of the healthcare system,[6] which can be measured in terms of clinical practice as well as in public health intervention. Increased efficiency, reduced costs and improved quality of care are important benchmarks in the reform of the healthcare system. To some extent, improving the quality of care is not only avoiding medical complications and the number of unnecessary services, but also reducing the medical errors and making patients more satisfied with the care they receive.

There are many issues with the quality of healthcare in China, including hospital accreditation as well as improper use of antibiotics and medical procedures, which cause spread bacteria and result in drug resistance. The application of clinical guidelines and practices can help doctors eliminate medical errors. Licensed pharmacists should play a role to promoting the proper use of medicines, drug quality management and ADR monitoring. Quality control and assurance is also important for strengthening the internal management of hospitals. Transparency in hospital services can be an effective tool to help patients choose hospitals.

7.1 Misuse of antibiotics

Infections caused by resistant microorganisms that fail to respond to conventional treatment can result in prolonged illness and greater risk of death. Inappropriate use of antimicrobial medicines creates favorable conditions to the emergence and spreading of resistant microorganisms.

In China, the use of antibiotics in hospitals is a very serious problem. They are even used in agriculture and the food industry to promote growth of cattle, poultry, pigs, fish and honeybees. Antibiotics have also been a main source of hospital revenue, making up 27.4 percent of total drug revenues for 120 public hospitals in 2001, later dropping to 21.6 percent by 2010. Antibiotics are used the most out of all 14 drug ATC categories.

Every year, 80,000 patients in China die due to the misuse of antibiotics, especially those listed on the drug reimbursement lists from insurers. China Health Insurance Association reported that 78.3 percent of inpatient treatment and 28.7 percent of drug expenditures are linked to antibiotics. According to the ICD-10 disease classification, 183 out of the 200 diseases (91.5 percent) were treated by antibiotics in China and 37.4 percent patients used more than three types of antibiotics.

[5] *Carrin G & James C: Reaching Universal Coverage via Social Health Insurance: Key Design Features in the Transition Period. WHO Health Financing Policy Issue Paper. 2004 Jan.; Wagstaff A & Lindelow M: Can Insurance Increase Financial Risk? The Curious Case of Health Insurance in China. The World Bank. World Bank Policy Research Working Paper 3741. October 2005.*

[6] *CCCP & State Council: The Opinion of Deepening Heath Care System Reform. China Issue No. 6, 2009.*

Resistance to drugs that treat tuberculosis is another example. The WHO reported 440,000 new cases of multiple drug-resistant tuberculosis (MDR-TB) emerge annually, causing at least 150,000 deaths. Drug resistance surveys in 11 out of 31 provinces indicated that 8.3 percent of TB cases are MDR-TB, as opposed to the average global MDR rate of only 4.8 percent. China contributes to approximately one-third of the world's MDR-TB burden. In China the prevalence of resistance among hospital-acquired infections was 41 percent (23%–77%), compared to 26 percent (15%–39%) for community-acquired infections.

In 2004, China published a national guideline for clinical antimicrobial use with the intention to establish policies on prescription drug management and non-prescription (OTC) drugs, including the requirement that patients have a doctor's prescription before they can obtain antibiotics from a pharmacy. China's Ministry of Health also recently released new regulations on the use of antibiotics that limit pre-operation use of antibiotics and only allow 30 and 50 antibiotics to be used in secondary and tertiary hospitals respectively.

7.2 Misuse of intravenous injection

Global data in 2004 showed that 5 billion out of the 16 billion injections given (31%) were given in China, making China the world's largest user of intravenous injection. An average of eight bottles of intravenous fluid were used per capita per year, which is higher than the world average of 2.5–3.3 bottles per capita per year.

This is mainly due to the lack of understanding among patients of the "quick results" received through intravenous injection, but another underlying reason is profit that it brings to hospitals. Misuse of antibiotics, cortisone, vitamin and intravenous injection is very common in rural China and 60 percent of ADR were caused by intravenous injection.

7.3 Caesarean section

The caesarean section rate in pregnant women was only 5 percent in China between the 1950s and 1970s. By 2007-08, the WHO reported that this rate had increased to 46 percent in China and is even higher (60%–80%) in some of China's megacities like Beijing, Shanghai, Guangzhou, Shenzhen and Hangzhou. China ranks second in terms of caesarean sections, far beyond the WHO standard of 15 percent.

Some social practices account for this practice as pregnant women often choose to deliver before the first of September or another "lucky" day so that their child can start school before autumn semester. Other factors, such as age group, psychological reasons, pain tolerance, economic incentives to use hospitals and a lack of midwives or nurses also increase the number of caesarean sections.

7.4 Drug quality and safety

The China Food and Drug Administration (SFDA) recently examined the quality of drugs and discovered major differences in the quality in the generic drugs. In 2012, the State Council formulated a national 12th Five-Year Plan on drug safety, which requires regular checks on all generic drugs. There are many reasons for low quality of generic drugs in China, including the low quality of raw materials, the lack of bioequivalence testing, and registration and approval systems based on standards rather than quality. Up to now, China has granted 188,200 drug licenses, 110,000 of which have been given to generic chemical products. 570 essential medicines alone involved 33,000 licenses and 2,400 pharmaceutical companies, which creates an incredible amount of work.

China will conduct compulsory quality consistency evaluations for all generic medicines in order to secure the safety and effectiveness of drugs. Some generic medicines will be taken off the market if they do not meet quality standards and the government will monitor the effectiveness and safety of generic medicines and provide incentives for quality medicines such as premium pricing and favorable bidding status.

China's SFDA has created a preliminary mechanism for monitoring the safety of medicines that includes new laboratories and equipment as well as a system for the supervision of traditional Chinese medicine, equipment and foods. The SFDA has also made the quality of essential medicines a priority and from April 1, 2011, all essential medicines are supervised electronically to ensure their quality. China has also developed a network to supervise cases of ADR in 31 provinces focusing on 960 pilot hospitals in 2010. Supervision of proper drug use now covers all tertiary and secondary hospitals in China, monitoring the number of antibiotics, the frequency of their use and pricing.

The MOH had released a document on the notification of safety events on quality of care, requiring the reporting of problems in medical quality as of April 2010 in response to a sharp increase in the number of ADR increased four times from 170,000 in 2005 to 690,000 in 2010. However, further action is required to strengthen legislation and regulation that forces pharmaceutical companies and distributors actively supervise rather than voluntarily notify.

The Ministry of Health divides the safety issues into three categories (table 5).

Level	Number of Deaths	Number of Injuries	Type of Injury	Time Required to Report
1	0	<2 persons, light injury	Organ & tissue damage and dysfunction	<15days
2	1-2	<2 persons, medium injury	Serious organ & tissue damage and severe dysfunction	<12 hours
		>3 persons, medium injury	Serious organ & tissue damage and severe dysfunction	<12 hours
3	>3	>3 persons, heavy injury	Special and extreme safety infractions	<2 hours

Table 5. Categories of safety issues in China

Source: Ministry of Health, 2012.

Drug safety is a major issue in China, especially in traditional Chinese medicine. Yunnan Beiyao is a well-known type of traditional Chinese medicine that is effective in stopping bleeding and treating pain in muscles and joints caused by bruises and rheumatism. It is ranked as a "level one" medicine and is protected by the government, but Hong Kong health authorities have claimed that there are unidentified harmful substances in certain batches of the product. This prompted the SFDA order the company to revise the medicine's instructions and monitor any reports of ADR.

Recently, the SFDA published its 2012 annual report on ADR, citing a total of 1.2 million cases of ADR, 56.7 percent of which were caused through intravenous injection. Of the 240,000 serious cases of ADR reported, 77.6 percent were caused through intravenous injection. Currently, 74.8 percent of ADR instances are reported by hospitals. The report

also showed that 85 percent of deaths were caused by anaphylactic shock. The solution lies in a combination of hospitals strengthening supervision of injections combined with eliminating reliance on intravenous injections by patients.

7.5 Clinical guidelines and pathways

Clinical pathways can go a long way to controlling unnecessary spending and improving the efficiency as well as the effectiveness of medical services. China began outlining clinical pathways in 1998 starting in Sichuan, Beijing and Tianjin and in 2009, the Ministry of Health formally designated 50 pilot hospitals to test clinical pathways for 112 diseases in 22 specialties. A total of 319 clinical pathways were published between 2009 and 2011. In 2011, the implementation of clinical pathways was expanded to 1,383 tertiary and secondary hospitals in 30 provinces/cities and by the end of 2011, most of tertiary and secondary hospitals in China were using clinical guidelines.

The next step is to expand the scope of disease pathways, which are insufficient to meet clinical requirements. Clinical pathways are only for specific disease and cannot be applied to multiple diseases or diseases with complications. Furthermore, the management of clinical pathways should be combined with hospital information systems and performance evaluation mechanisms.

In 2012, a total of eleven hospitals in Beijing were using clinical pathways. The highest nosocomial infection rate was only 0.6 percent and the highest readmission rate for hospitals was 1.3 percent. After implementing clinical pathways, both clinical effectiveness and the proper use of medicine improved.

7.6 Hospital accreditation

The first round of hospital accreditation began in 1989, focusing on delivery of service and hospital functions. Hospitals in China are classified into primary, secondary and tertiary hospitals. Tertiary hospitals usually provide high-level, specialized medical services, while at the same time, carrying out medical education and scientific research. Hospitals at each level are also further divided into three classes, A, B and C with class A tertiary hospitals being the most advanced hospitals in a given region. In 2011, China had 1,350 public tertiary hospitals, 6,034 secondary hospitals and 2,908 primary hospitals.

Due to the negative impacts of uncontrolled growth and technology races, the Ministry of Health stopped hospital accreditations in 1998. In 2008, the MOH developed a revised method of hospital accreditation, which in went into effect in 2010. Unfortunately, in this second round of hospital accreditation, 240 hospitals were immediately accredited as tertiary hospitals without consulting regional healthcare planning authorities. However, this approval meant automatic increases in fees, resource allocation and doctor remuneration. The danger of this system immediately became apparent and in 2011, the MOH eliminated accreditations again. Going forward, improving internal hospital will be the main focus of any hospital accreditation system, which will be based on field follow-up examination, paper reviews, data analysis and social opinion surveys. Content will include the contributions to public welfare, patient safety, quality of medical service and CQI, nursing care.

7.7 High quality nursing care

In early 2010, the Ministry of Health implemented a trial project to improve the quality of nursing care nationwide. Over the past three years, the model for clinical nursing care

model has been transformed to ensure that nurses are accountable, professional and provide patients with a comprehensive, humanistic style of care.

The quality of nursing care has improved a great deal. The Ministry of Health commissioned a third-party survey of discharged patients in November 2012 to evaluate their satisfaction with the quality of nursing care. Telephone interviews with 4,610 patients in 112 trial hospitals showed that overall satisfaction was 93.12 percent, 4.15 percentage points are higher than the previous MOH survey (88.97%) in 2011. The majority of patients (95.1%) knew which nurse was in charge of their care and sought help when they needed it. Satisfaction for six items in the survey, including nurses' respect for patient dignity, compassion, answering questions, observing patient condition, listening and comforting of patients, informing patients of their actions in advance, was all over 90 percent.

Statistics show that as of the end of November 2012, all tertiary hospitals and 80.6 percent secondary hospitals provide high-quality nursing care, as well as in 75.9 percent of tertiary hospitals. Now, the focus should be on establishing a long-term mechanism to fully mobilize the enthusiasm of nurses and to continue promoting high-quality nursing care.

7.8 Hospital rankings

The Fudan University Institute of Hospital Management has conducted one hundred hospital rankings since 2009. The purpose of these rankings is to establish a benchmark for comparison of comprehensive hospitals in 28 adult and pediatric specialties. Table 6 shows the Top 20 Hospitals in China in 2011.

	Name of Hospital	**Total Score**	**Research Score**	**Total Score**
1	Beijing Union hospital	80.00	10.95	90.95
2	Sichuan Huaxi hospital	69.42	20.00	89.42
3	PLA General hospital	58.16	14.52	72.68
4	Ruijin Shanghai Jiaotong Univ.	42.92	11.90	54.83
5	Xijing 4th Military Medical Univ.	33.99	12.99	46.98
6	Zhongshan, Fudan Univ.	32.83	13.66	46.48
7	Huashan, Fudan Univ.	34.70	10.23	44.93
8	First hospital, Peking Univ.	32.43	9.10	41.53
9	People's Hospital, Peking Univ.	29.25	8.88	38.13
10	Tongji hospital,	26.43	11.13	37.56
11	First Hospital, Zhongshan Univ.	25.15	12.26	37.41
12	Peking Univ. 3rd Hospital,	18.42	9.29	27.72
13	Union hospital, Tongji Med. College	15.61	10.85	26.45
14	First hospital, Zhejiang Univ.	13.13	13.09	26.22
15	Changhai, 2nd Military Med. Univ.	14.35	11.25	25.60
16	First hospital, China Med. Univ.	15.05	10.17	25.21
17	Fuwai Heart-Vascular Disease Hospital	12.75	12.43	25.16
18	Xiangya 2nd hospital. Zhongnan Univ.	13.53	9.06	22.59
19	Renji hospital, Jiaotong Univ.	12.82	9.64	22.46
20	Southern Hospital, Southern Medical Unv.	12.98	9.32	22.29

Table 6. Top 20 hospitals in China (2011)

Source: Health News. Page 8. November 26th, 2012.

Quality of care should be prioritized in the reform of China's healthcare system as well as public hospitals. Poor quality of care is the root of all medical errors and improved quality of care can reduced the number of medical errors. Transparency in the quality of medical services is an effective tool to inform patients when they are choosing a hospital. It also serves to promote competition between public and private hospitals.

8 Measuring the Performance of the Healthcare System

8.1 Quality registries in China

There is no formal national quality registry system in China. Many disease registries and patient registries are collected by specialized medical associations, medical interest groups or pharmaceutical companies.

The Health Statistics and Information Center of the Ministry of Health and its branches in provincial health bureaus routinely collect all patient information using ICD-10 classification. Information comes from the first page of patient medical records as reported by the Department of Medical Records in each hospital nationwide. Contents include demographic data, diagnosis, surgical records, length of stay, medical costs, etc. China's Health Statistics Year Book, published by the MOH, including the cost of 30 major diseases in hospitals at different levels.

Another disease registry source is from the national household study done every five years, the last conducted in 2012. The sample size is distributed covers all of China's provinces including at least two counties or cities as sample locations. The total sample size is more than 100,000 people. The types of diseases reported during ambulatory visits or admissions are recorded in order to obtain information on morbidity and prevalence rates of acute and chronic diseases. Finally, the data on demand, use and cost is also obtained. The national household study has been widely used to evaluate the performance and reforms in China's healthcare system.

Under the leadership of the MOH, a system for stroke prevention and control was established in 2010 and in 2011-2012, six provinces carried out a pilot project screening high risk groups among 800,000 people aged 40 years and above. In 2012-2013, the project was expanded to 16 provinces and cities with RMB 72 million in financial support from the central government. It will be extended nationwide in 2014 with all designated hospitals completing screening and prevention work. At least 3,000-5,000 cases are discovered in outpatient and inpatient treatment every year.

In China, medical insurance claim data collected from the three major medical insurance schemes is also an important source of information on the economic burden of disease and the balance of insurance funds. The Chinese Health Insurance Association plays an important role in the management and analysis of this data.

Many medical interest groups use their clinical data or register to collect, analyze or publish periodically. For instance, data on hemodialysis and peritoneal dialysis are reported by the nephrology department and managed by the Nephropathy Professionals Board of the China Medical Association, which publishes an annual report. The disease register of diabetic foot diseases, a serious complication of diabetes, is kept by the Department of Endocrinology at Chinese Army Hospital 306.

Pharmaceutical companies are usually interested in patient registers, but they concentrate mainly on their own products development. For instance, Bristol-Myers Squibb have used quality registers to assess the value of Entecavir, while Baxter Pharmaceuticals has focused on the sale of peritoneal dialysis drugs, registering all patient names and following up on the results of their treatment.

Creating a health information database is one of main goals of recent healthcare system reform. It includes electronic health records for residents, an exchange of medical records between hospitals and community health centers, medical information inquiries, billing of medical expenses and dynamic monitoring of health status. As of January 2012, the number of patients with hypertension in the system reached nearly 60 million, while more than 18 million patients with diabetes are under management. The links between hospitals, community health centers and the Disease Prevention and Control Centers will improve the treatment of patients suffering from chronic diseases. In the register, patient data is not anonymous to ensure easy retrieval and follow-up on individual patients, but patient consent forms are required to use the information.

8.2 Measuring the quality and efficiency of healthcare

China measures the equity, efficiency, quality and cost of healthcare as intermediate indicators of healthcare system performance.[7] Departments of Health Statistics and Information at the national, provincial or county level publish annual reports to the public.

Chinese Ministry of Health carried out a so-called "medical quality supervision in 10 thousand mile trip" movement in 2009. Afterwards, it conducts every year to supervise the quality of medical service in secondary and tertiary hospitals nationwide. For instance, MOH organized 217 experts to do the field supervision in 308 hospitals in 2012. The simple expression is "Three Good and One Satisfaction", that means good service, good quality and good medical ethics plus people satisfaction in medical service. The evaluation items include 14 dimensions, such as whether or not hospital has established a quality assurance and quality control committee, medical service system, the application of medical technique, medical safety and medical error, rational use of medicines and antibiotics, quality of optimal nursing care, nosocomial infection control, isolation and disinfection, implementation of clinical pathways, electronic medical records and hospital financial and price management. Results showed that 97 percent of hospitals meet the standard number of antibiotics. In primary care institutions (community health centers and affiliated locations), the service quality is supervised by Community Health Service Demonstration Centers every year. Table 7 shows the main indicators of efficiency, cost and quality.

Domains	**Indicators**
Efficiency	1.Bed turnover rate per year
	2.Average length of stay in hospital (No. of days)
	3. Bed occupancy rate (%)
	4.Total volume of medical services (No. of ambulatory visits, discharges and surgeries)
	5.Workload per doctor (No. of visits, No. of bed-days)
Cost	1.Average cost per clinical visit (primary care, secondary & tertiary hospital)
	2.Average cost per discharged patient (primary care, secondary & tertiary hospital)
	3.Average cost per bed day
	4.Average cost for different diseases in hospitals

[7] *Carrin G & James C: Reaching Universal Coverage via Social Health Insurance: Key Design Features in the Transition Period. WHO Health Financing Policy Issue Paper. 2004 Jan.*

Domains	Indicators
	5.Total medical cost (outpatient and inpatient)
Quality	1.Bed-nurse ratio and doctor-nurse ratio
	2.No. of clinical pathways implemented in hospitals
	3. Rational use of medicines (antibiotics, anti-cancer drugs, etc.)
	4.Nosocomial infections (isolation and disinfection)
	5.High quality nursing care systems
	6. Electronic medical records (eMR)
	7. Medical errors and medical safety
	8. Quality management and control system
	9."Three Good" (good service, good quality, good medical ethics) and "One Satisfaction" (people and patient) policies

Table 7. Main indicators of efficiency, cost and quality

Source: Ministry of Health, 2012.

In China, healthcare system management is guided by various laws, orders, regulations, ordinances, plans and individual policies. For instance, the recent "12th Five-Year Plan for Healthcare Development" is a medium and long-term planning guideline for the period 2011-2015. Individual applicable policies that work in tandem with medical services include the "compendium for development of nursing care in China (2011-2015)", the "action plan for prevention and control of hospital infection (2011-2015)", the "program of prevention and treatment of blindness in China (2012-2015)", "guiding opinions on rehabilitation in the 12th Five-Year Plan", opinions on consolidating and improving essential medicine supply systems and new mechanisms for grass-roots health centers", all of which are issued by the State Council.

8.3 Evaluation of antibiotics use

In China, improvement of the quality of healthcare is focused on two areas - controlling in-hospital infections and controlling the use of antibiotics. There are many healthcare quality supervisory agencies in given area, including the local health authority (i.e., Department of Hospital Administration), non-government organizations (regional or municipal medical quality centers), and the Hospital Management Association and Healthcare Quality Management Committee at the hospital level.

At the macro level, the government issues policies and guidelines, such as accreditation standards for tertiary comprehensive hospitals issued by the MOH in 2011, followed by standards of special hospitals. The MOH plans to take three years to bring the use of antibiotics in China under control. The target is that the usage of antibiotics in inpatient departments reaches no more than 60 percent and in outpatient departments no more than 20 percent. In 2011, of 430 hospitals surveyed, most were found to have their antibiotics under control.

At the mid-level, hospitals establish antibiotics management groups and clinical antibiotics usage lists, and set the indicators to standardize how doctors prescribe them. Peer reviews of prescriptions are also conducted every month in hospitals, looking at a 25 percent sample of prescriptions.

At the micro level, doctor behavior is observed through peer reviews of prescriptions containing antibiotics. At least 50 prescriptions per doctor, that contain antibiotics, will be

examined, especially in key departments, like infectious diseases, surgery, respiratory disease, and ICU situations.

According to the "Guiding Principles of Clinical Use of Antibiotics" published by the MOH, antibiotics are divided into three classes: non-limited use, limited use and special use. Doctors must attend training courses and pass examinations to prescribe certain antibiotics. Hospital Information Systems (HIS) also have settings that allow doctors to prescribe different antibiotics based on their title. Appendix 1 shows the number of limited used antibiotics in different classes of hospitals.

There are two antibiotics surveillance networks operated by the MOH and Provincial Health Bureau, respectively. One is the antibiotics utilization surveillance network and the other is the bacteria antibiotics resistance surveillance network. In Hebei Province, a total of 46 hospitals joined the antibiotics utilization surveillance network, while 63 hospitals have carried out antibiotics resistance surveillance network work at the national or provincial level.

8.4 Evaluation of hospital performance

As of today, all departments in Beijing municipal hospitals have performance evaluation systems and operate on a pay-for-performance system to increase professionalism (Table 8). The daily workload has increased to 0.8 patients per doctor and total patient cost was reduced by RMB 645 million. In a third-party satisfaction survey commissioned by the Beijing Hospital Administration Bureau, the average rate of satisfaction was 86.25 percent for 21 municipal hospitals. The survey was conducted using field interviews with outpatient departments and telephone interviews with discharged patients.

	2011	**2012**	**Difference (No. or %)**
Annual number of visits (million)	24.48	27.26	+12.4%
Annual number of discharges (thousand)	511.9	578.6	+13.04%
Average length of stay (day)	10.8	9.8	-1.0
Bed turnover rate	33.8	37.24	+3.38
Average cost per visit (RMB)			-8.5
Average cost per admission (RMB)			-716

Table 8. Hospital performance improvement in Beijing, 2012.

Source: Beijing Bureau of Health, 2013.

Box 3. Hospital performance evaluation in Beijing

The Beijing Hospital Administration Bureau designated 25 quantitative indicators and 20 qualitative indicators to evaluate public hospital performance in terms of social evaluation, internal management, efficiency of implementation and developmental strengths. These indicators reflect hospital performance in the areas service quantity and social satisfaction.

The report released by the Beijing Health Bureau rated the performance of 21 municipal hospitals in 2012 with 11 rated Grade A (>90) and 10 rated Grade B (75– 89). No hospitals were rated Grade C and Grade D. The average score was 90.04 and the highest score was 95.59 and belonged to Chaoyang Hospital. The top five hospitals were Chaoyang, Tiantan, Ditan, Xuanwu and Shijitan.

The Shanghai Health Bureau circulated the Bulletin of Health Information within the hospitals. Comparison of data from 2011 and 2012 appears in the table below, showing the growth rate of ambulatory visits and discharges, workloads per doctor, bed turnover rates and bed occupancy rates. All of these values increased, while the average length of stay declined, indicating an improvement in the efficiency of healthcare services. Cost-efficiency analysis in ambulatory visits showed that public hospitals were more cost-efficient than private hospitals and community primary care centers were more cost-efficient than secondary and tertiary hospitals (Table 9).

	Cost per Visit (RMB)		
	2012	**2011**	**Growth Rate (%)**
Total	219.22	212.02	3.40
Hospital	278.18	265.39	4.82
Public hospital	272.92	261.08	4.54
Private hospital	366.84	335.38	9.38
Hospital			
Tertiary hospital	314.28	299.97	4.77
Secondary hospital	222.84	215.29	3.51
Community health center	115.60	107.38	7.66

Table 9. Cost-efficiency analysis of ambulatory visits in Shanghai hospitals

Source: Shanghai Bureau of Health, 2013

8.5 Evaluation of healthcare system reform

China's healthcare system has seen huge changes following the reforms of 2009-2011, but the next three to four years will mark another milestone. Between 2009 and 2011, the Ministry of Health used forty-five indicators to measure access, coverage, equity, efficiency and quality in the healthcare system (Appendix 2), including basic medical insurance (9), essential medicine (11), equity of public health service (6), strengthening the grass-roots health institutions (9) and public hospital reform (6).

8.6 Evaluation of healthcare system performance

With the issuing of the 12th Five-Year Plan for Healthcare Development, a basic medical and healthcare system covering urban and rural residents will be initially in place by 2015. All residents will receive universal coverage under basic medical insurance and have access to basic public health services. The accessibility of health service and the quality, efficiency and satisfaction among patients will be significantly improved. The economic burden of personal medical costs will also be significantly reduced. Regional health disparities in the allocation of health resources and the gap in different population groups will also continue to be narrow.

There are 23 goals under the plan to improve the performance of the healthcare system, including:

- An increase of three percentage points in the coverage rate for urban and rural basic medical insurance over 2011;
- Personal health spending of less than 30% of annual total health expenditures;

- Length of stay less than nine days in secondary and tertiary general hospitals;
- Infant mortality rate of <12 ‰;
- Child mortality of <14 ‰ for children under five years; and
- Maternal mortality rate of <22/100,000.

The incentives for development between the public and private sectors are different. In the 12th Five-Year Plan, the focus has been on optimizing resources between the public sector and private sector. However, regional health planning in the future will focus on the demand for healthcare. The expansion of public hospital is currently under control and if the number of hospital beds exceeds 4/1,000 people, expansion will no longer be necessary and investment can be transferred to rural areas and urban community. The next step will be developing rehabilitation centers and nursing homes to meet the needs of an aging population. By 2015, facilities for acute and chronic illnesses will be separated.

The plan also called for the involvement of private investment in cities currently dominated by public hospitals, including the creation of private hospitals or the restructuring of state-owned public hospitals. By 2015, the number of beds and volume of medical services delivered by private hospitals will reach 20 percent. However, in certain hospitals dominated by public hospitals, like Shanghai, this 20 percent target will be very difficult. According Shanghai's own recently drafted 12th Five-Year Plan for Healthcare Development, the local government has required the number of private hospital beds to increase by only 3-4 percentage points.

The plan also focuses on ensuring the quality of medical services in the following areas:

- Requiring all tertiary hospitals and 80 percent of secondary hospitals to implement clinical pathway management and disease quality control;
- Strengthening the supervision of medical services and pay-for-performance for doctors and nurses, promoting negotiation to resolve medical errors and disputes;
- Implementing an objective system for performance evaluation in public hospitals with indicators that include growth rates of cost per visit, cost per bed-day, total medical expenditures and the proportion of pharmaceutical expenditure as part of total medical expenditures;
- Improper use of medicines, medical supplies and medical examinations;
- Control of non-essential medical services in public hospitals;
- Improving the quality of essential medicines through quality consistency testing and the establishment of an electronic supervision system.

As an incentive for developing rural and urban grass-roots healthcare institutions, the Chinese government has prioritized the development of county hospitals, which can provide treatment for 90 percent of common diseases, rehabilitation needs, emergency care and some severe diseases with complications. In addition, community health services will also be improved. By 2015, every neighborhood (30,000-100,000 people) will have access to a community health center.

9 Concluding discussion

China's three year reform plan, launched in 2009, marked the first phase towards achieving comprehensive universal basic healthcare for all its citizens by 2020. The government adopted five key reform priorities for the first three years of reform: accelerating the expansion of the basic health insurance system; establishing a national essential drug list system; improving primary healthcare services; promoting the equalization of basic public health services; and facilitating pilot reform programs in public hospitals.

Of the five priorities announced in 2009, expansion of health insurance coverage stands out as the more successful; the expansion of basic medical insurance programs and creation of a rural co-operative medical system already today enroll more than 90 percent of urban and rural residents. The government and healthcare organizations have also set up clinical registries and mechanisms to evaluate a range of issues, from quality and safety to efficiency and performance, laying the groundwork for a more solid healthcare infrastructure in the future.

While the recent reforms seem successful, it is clear that the Chinese healthcare system faces several challenges in the future. Although the government is constantly trying to adapt the system to the needs of the population and to improve performance, problems concerning misuse of antibiotics, drug quality and supply, as well as hospital accreditation, are officially recognized.

Looking ahead, the Chinese healthcare system faces a substantial increase in demand. The one child policy has led to a rapidly ageing population that will demand more healthcare resources, and with a rapidly growing middle-income class, demand for quantity as well as quality of healthcare is likely to increase. Such an increase in demand can hardly be met directly by the public healthcare system. As a result the government is encouraging private investments in the construction of new hospitals and other care facilities and there is a robust combination of public and commercial insurance schemes for people to choose from.

China is still at the outset of reforming its healthcare system and its implementation is likely to be an arduous challenge. The reform plan has important implications not just for China's healthcare system, but also for society at large.

10 Appendix

Appendix 1: Number of limited used antibiotics in different classes of hospitals

Classes	Requirements for Hospital
C (pass)	1. Restrict/control the number, strengths, volume of antibiotics in hospital, usually less than 35 antibiotics 2. Under the same generic name, the number of oral or IV versions should be less than two. 3. Hospitals cannot purchase more antibiotics with the same or similar pharmacological characteristics 4. There is a temporary process for purchasing antibiotics in place. 5. The time of preventive use of antibiotics before operation should not be beyond 30 minutes to 2 hours. The time of operational patient with an A-class incision operation will be no more than 24 hours. The proportion of inpatient used antibiotics should be no more than 30 percent.
B (good)	1 Meet all requirements in Class C. 2. Proper procurement of the products and strengths of antibiotics: The number of cephalosporins should be less than two products, the number of cephalosporins in the third and fourth generation in per-oral dosage form should not be more than five products; IV types should not exceed eight products. The number of carbon carbapenem in IV form should not be more than three products, and the number of fluoroquinolone (FQNS) either in per-oral dosage form or IV form should not be more than four products. If suffering from deep fungal infections, the anti-fungal antibiotics should not exceed five products. 3. The proportion of antibiotics used by inpatients should be no more than 40%. The proportion outpatient prescriptions for antibiotics should not exceed 10%. The volume of antibiotics should be controlled to within 300 DDDs per 100 persons per day.
A (super)	Meet all requirements in Class B. The hospital may apply to add one more antibiotic to its temporary purchasing list, if need be. In principle, no more than five emergency purchases may be made each year. The proportion of inpatient and outpatient prescription with antibiotics and the volume of antibiotics should be the same as in class B.

Source: Ministry of Health, 2012.

Appendix 2: Indicators of efficiency and quality in the healthcare system, 2011

1. New Rural Cooperative Medical Scheme	
• Premium per capita (RMB person-year)	244.6
• Government subsidies (RMB person-year)	207.8
• Percentage of counties conducting pooling fund payment for ambulatory visits (%)	96.9
• Percentage of counties reimbursement ratio >70% in inpatient department	86.2
• Percentage of counties covers the reimbursement for childhood leukemia and congenital heart disease (%)	93.0
• Percentage of counties can get reimbursement if patient searching medical care from other counties (%)	77.7
• Percentage of counties conducting payment system reform, i.e., capitation, disease and global budget (%)	76.6
• Percentage of counties carrying out free choice system (%)	48.5
• Percentage of counties sharing information between RCMS, UEBMI and medical aid systems (%)	47.7
2. Essential Medicine Policy	
• Percentage of government-run grass-roots health institutions with zero-markup drugs (%)	98.8
• Percentage of village health posts with zero-markup drugs (%)	41.5
• Percentage of grass-roots health institutions conducting comprehensive reforms (%)	95.8
• Percentage of grass-roots health institutions establishing global control and dynamic management in human resources (%)	90.5
• Percentage of government-run health institution with job descriptions (%)	93.9
• Percentage of counties with pay-for-performance systems (%)	
• Percentage of counties where government-run grass-roots health institutions have special subsidies and current revenue and expenditure subsidies (%)	95.1 90.8
• Percentage of counties where grass-roots health institutions have comprehensive quantitative evaluation system (%)	93.6
• Percentage of counties that have village doctors subsidies (%)	94.6
• Percentage of counties that receive government financial subsidies for implementing essential medicine systems (%)	67.2
• Percentage of village health posts designated by RCMS (%)	68.5
3. Equality of Public Health Services	
• Rate of standardized e-Health Records for residents (%)	55.3
• The average subsidy of public health service per person per year (RMB)	26.5
• Percentage of counties where public health institutions have a financial budget management department (%)	84.1
• Rate of in-hospital deliveries of pregnant women subsidized by the central government (%)	93.1
• Rate of folic acid supplements for pregnant women subsidized by the central government (%)	105.0
• Rate of healthy toilet programs in rural areas subsidized by the central government (%)	108.0
4. Public Hospital Reform	
• Percentage of counties establishing first contact and referrals in grass-roots health institutions (%)	79.2
• Percentage of clinical visits from CHCs and township health centers in total number of clinical visits (%)	24.5
• Percentage of secondary hospitals with clinical pathways (%)	40.5
• Percentage of secondary hospitals that mutually recognize examination results (%)	77.5

• Percentage of secondary hospitals that provide immediate reimbursement (%)	87.2
• Percentage of secondary hospitals using electronic health records (%)	32.1
5. Grass-roots Medical System Reform	
• Coverage rate of construction for community health centers (%)	85.1
• Coverage rate of construction for public county hospitals (%)	63.8
• Percentage of counties where at least one Class II A secondary hospital at the county level (%)	69.6
• The coverage rate of construction in government-run township health centers (%)	69.5
• Coverage rate of village health posts (%)	89.7
• Percentage of township health centers conducting consultation outreach (%)	77.4
• Percentage of urban districts using GP team building and family doctor contract systems (%)	38.3
• Percentage of township health centers conducting integration of management in township and village services (%)	73.4
• Percentage of village health posts conducting integration of management in township and village services (%)	57.4

Source: Ministry of Health, 2012.

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Growth Analysis Studentplan 3, S-831 40 Östersund, Sweden
Phone: 46 10-447 44 00 | info@growthanalysis.se | www.growthanalysis.se