The Chinese Health Care System: Structure, Problems and Challenges

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Abstract

In the present paper we describe the structure of the Chinese health care system and sketch its future development. We analyse issues of provider incentives and the actual burden sharing between government, enterprises and people. We further aim to identify a number of current problems and link these to a discussion of future challenges in the form of an aging population, increased privatization and increased inequity.

1. Introduction

In the late 1980s the Chinese government launched a major reform of the social insurance system, including reforms of pension—and health care schemes. This reform has had a huge impact on the organization of the entire public welfare system. It has been implemented using a series of local experiments, of which particular models have been selected for national implementation. The system is constantly changing trying to respond to current financial problems and adapt to the need of the population.

Despite many efforts, the general impression of the population as well as the governing authorities is that the reform has not been successful.[1] Cost inflation has been difficult to control and the huge inequality in access seems to be further increased. On top of this, the reform process itself has made the population confused and uncertain about their rights in the system and, when adding that the lack of regulation makes the system more exposed to corruption, this distrust only becomes worse. China is a country with huge regional differences. It is therefore questionable whether it makes sense to talk about one coherent system or whether one should more likely consider the system as several co-exiting subsystems — subsystems that seem to be related to different groups of people as well as differences in geographic location. Moreover, any empirical analysis of the Chinese health care system will suffer from considerable data uncertainties and often even a crucial lack of relevant data.

Nevertheless, there have been many previous papers aiming to describe the Chinese health care system and its reforms, e.g. Hsiao (1995), Yip and Hsiao (1997), Hu *et al.* (1999), Hu (2004), Blumenthal and Hsiao (2005) and the recent survey by Eggleston *et al.* (2007). The present paper follows up on these works describing and analyzing the present structure and organization of the Chinese health care system. We try to identify the root of the main problems with the current system, and discuss these in relation to the immense future challenges of the system such as an aging population, increasing privatization and greater inequalities.

We focus in particular on the burden sharing and provider incentives. Concerning the burden sharing issue we find that the actual level of risk sharing is relatively low and in reality people are left to cover the main part of their health care expenses by themselves, which again creates huge inequalities in access to health care among the population. Moreover, provider incentives seem to intensify this problem by creating substantial cost inflation.

The paper is organized as follows: Section 2 is a general description of the Chinese health care system: the overall organization, the financing, the allocation of health care benefits, and a description of the providers including their incentives. Section 3 summarises the main

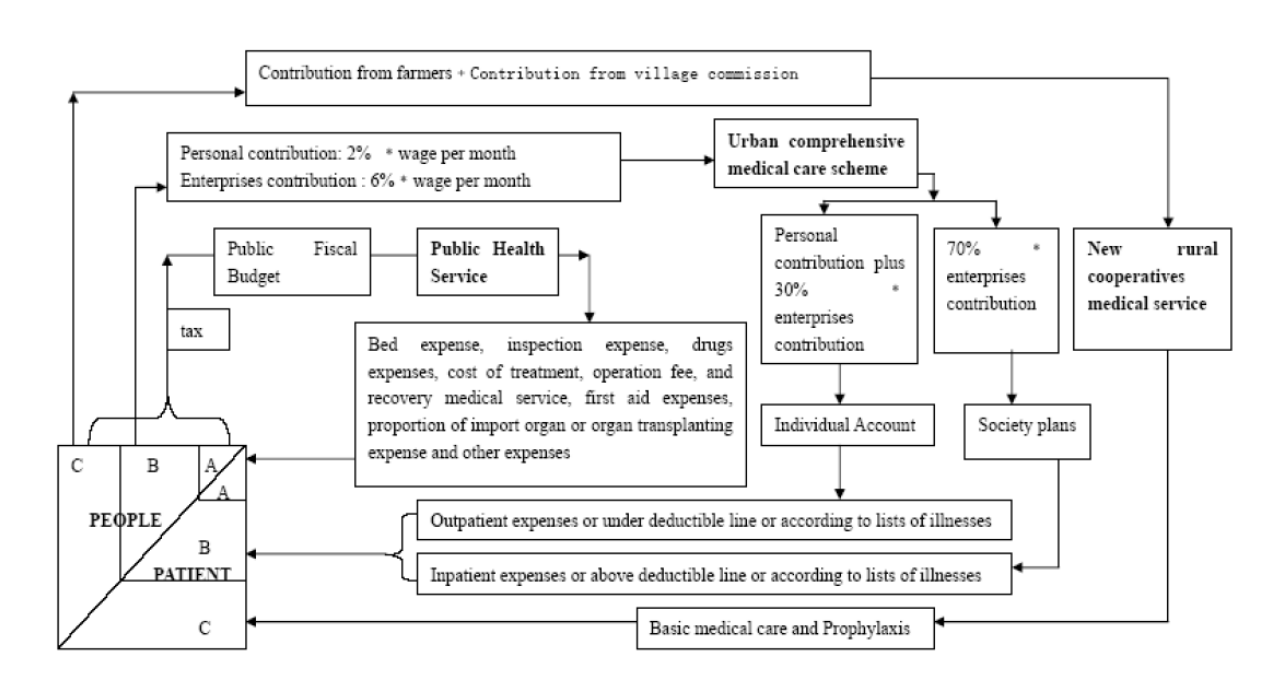
[1] See. Development Research Center of the State Council & WHO (2005).

problems exposed during the analysis in Section 2, and finally Section 4 concludes with some considerations on future challenges of the Chinese health care system.

2. The Chinese Health Care System

In connection with China's economic reforms in the early 1980s the health care system went from an old style communist system with the central government as owner, sponsor and provider to a system where the central government plays a much more limited role. The responsibility for financing and administering the health care sector was mainly transferred to the local authorities of the different provinces. Financing the services therefore became dependent upon local taxation paving the way for substantial inequalities between rich costal regions and poor rural regions. By reducing the public financial support, the providers in the health care sector were also forced (and allowed) to earn profits on specific types of treatments and drug sales introducing various moral hazard issues, which, much like in the U.S., resulted in a significant cost inflation and further inequality in access, see, e.g. Blumenthal and Hsiao (2005) . The current health care system, which is the result of a series of health care reforms and local experiments in the 1990s can be characterized by an overall structure as illustrated in the flowchart of Figure 2.1 below.

Figure 2.1: The Chinese health care system



Basically, the system design builds on a separation of the population into three groups called A, B and C according to job functions. The A-group consists of staff in all levels of government, the "parties", NGO-like groups, public organizations, the army, staff in the public health sector and research institutions as well as in the education system (including university students). This group is regulated by the "public health service administration act" from 1988. The B-group consists of staff in all kinds of enterprises in urban areas (regulated by "the decision of the state council about construction of comprehensive medical care scheme among urban workers" from 1998) while the C-group consists of population in rural areas not covered by any specific regulation. A very small subset of those in the C-group is under "new rural cooperative medical care scheme" — typically farmers located around the south east part of the costal area.

There is no official statistics that account for the relative sizes of the three groups A, B and C, but a rough estimate (based on the estimate of Central Party University, reports from the

Labour and Social Security Ministry, and the National Bureau of Statistics of China) [2] seems to indicate that group A, B and C respectively, represents approximately 5, 11 and 64% of the total population. Traditionally, Chinese researchers have considered the system as consisting of two separate parts, an urban and a rural system. In this sense it can be linked to the so-called "*hukou*" system — a population registration system where people are classified according to their geographical location. The A and B group is for people with city-*hukou* while the C-group is for people with rural-*hukou*. However, the individual *hukou*-status may change in connection with job changes. For instance, if a student with rural *hukou* moves to a city university he/she will receive a temporary city-*hukou* which may become permanent if this person gets a job in the city after graduation — but there are also many instances where people with rural *hukou* is actually working in the city industry without a *hukou* change. As we shall see, this mix up between job function and *hukou*-status often leaves weak groups of the population uncovered by the health care system.

We emphasize the difference between A and B-group for several reasons. First, each of the three groups are actually regulated by a different ministry: the China National Labour Union and the Ministry of Organization are responsible for the A-group, the Ministry of Labour and Social Security for the B-group, and the Ministry of Health for the C-group. Second, on top of the difference in job function (public sector employees versus industry employees) there is a huge difference in their actual health benefits. Third, the actual relative size of the A group implies that they cannot be ignored as an independent group. However, insisting on treating A and B groups as independent (for the reasons mentioned) implies that many of the official data sources are difficult to fit into our framework and we shall mention specifically whenever this is the case.

For group A, all health care expenses are basically fully covered according to the 1988 regulation. However, the government has announced that there will be a gradual change of the conditions of the A-group towards a system more like that of the B-group, but up to now they have managed to maintain their "old" privileges (see also Section 2.1. below).[3]

For group B, which is under the "urban comprehensive medical care scheme", the system is more complicated. Basically, the system is designed as an employer-based insurance scheme[4] consisting of both an individual account and social pooling where it is intended that the individual pays 2% of the gross income[5] to his/her personal account and that the enterprise pays in total 6% of the individuals income of which 30% is allocated to the individual account and 70% is allocated to the social pooling.[6] However, in effect the implementation of this scheme varies a lot between wealthy costal provinces and the rest of the country as well as between enterprises with different types of ownership. For instance, typically unskilled labour in privately owned enterprises are not covered by this type of scheme even though they are

[2] According to Zhou Tianyong from the Central Party University, the number of A group members is approximately 70,000,000 (see *Control the Personal Inflation of Civil Servants* in China News 2005, http://www.chinanews.com.cn/news/2005/2005-06-12/26/585502.shtml (in Chinese). According to the Annual Statistics Report 2005 from the Chinese Ministry of Labour and Social Security, the number of actually covered B-group members is 137,830,000. Finally, according to the 5th Nation Population Census by the National Bureau of Statistics of China, the number of (theoretically covered) C-group members is 807.39 million, i.e. the total size of the rural population.

[3] Source: *Opinion about Medical Care Subsidy of Civil Servants*, Ministry of Labour and Social Security and Ministry of Finance, Office of State Council, May 20 2000.

[4] As argued in Dong (2006), this scheme is inspired by the Singaporean medical savings accounts model, which was implemented in Singapore in 1984.

[5] In fact, typically individuals do not have to contribute to the individual account if their wage is below 60% of the local average wage and they only have to pay a maximum of 2% of 3 times the local average wage in case their income is above this amount. Both the average wage and the actual upper and lower thresholds vary among provinces and may be used as a means to control health care expenses.

[6] These contribution rates may vary between regions according to the general economic situation.

under the same regulation — this happens without local government sanctions although the policy seems to be changing on this issue.[7]

For group C there is no universal coverage, but there are various local initiatives trying to establish voluntary insurance schemes especially in the rich costal provinces. The main problem being that people are typically too poor to join these schemes and among those who actually join there is a large element of adverse selection as discussed in Wang et al. (2006). Usually the funds involved are very small and therefore these schemes have a limited effect. Moreover, around 100 million farm workers (with a growth rate of about 5 million per year according to Xinhua News 2005)[8] actually work in the city industry and consequently should be enrolled in the scheme for the B-group, but in reality these workers are left uncovered.

The main structure of the general institutional setting is shown in figure Table 2.1 below. In short, there are three layers of government: central government, provincial government and city government. The central government is responsible for the general system design and for formulating policy and reform programs. The central government does not perform any direct reallocation of tax revenues, but there is some element of vertical transfers of funds to provinces in need of extra resources for their health care programs. The size of these funds is based on a bargaining procedure between the central government and the provinces. The provincial governments collect their own tax revenues and administer the health care plans. They further share the responsibility with the city government for providing the services. However, it is quite normal in provinces with very heterogeneous conditions to arrange the social pooling at a city level.

Table 2.1.1. *Overall institution arrangement*

Institutional level	Responsibilities
Central	----Political and legal framework ----Funding local government according to the negotiation
Provincial	----Administration of social plan and individual account ----Provision of services
City	----Administration of social plan and individual account ----Provision of services
* Typically provincial and city government share administration responsibility according to the local economic development	

2.1. Financing the Health Care System

Loosely speaking, the costs of running the Chinese health care system are financed by three main parties; the government, enterprises and individuals. The costs of government concern

[7] Cf., e.g. *Announcement about Further Expansion of the Basic Medical Insurance Coverage*, Wuxi City Labour and Social Security Bureau, Wuxi Labour and Social Security Net, March 9, 2002. http://www.wxlss.gov.cn/html/2002-03/2339.htm See also *Announcement about Further Expansion of the Basic Medical Insurance Coverage*, Chongqing City Labour and Social Security Bureau, Health Chongqing Net, July 12, 2003. http://www.jkcq.com/zcfg/ybzq/200611/765.html. (both in Chinese).

[8] http://www.cott.org.cn/newsdetail.cfm?iCntno=4140 (in Chinese)

all levels of government, which are mainly covered by taxation but also by various sorts of user fees. Lately, however, the government has been in search of new sources of income, for instance, the public welfare lottery also contributes to health care financing. Moreover, local governments in rural areas typically make use of various types of fees when financing their health care initiatives. In China tax revenues primarily comes from income tax, turnover tax and sales tax on enterprises. Enterprises include both state owned, collectively owned[9] and private enterprises. Immediately after the reform, mainly state owned enterprises paid their share of the basic medical care scheme (for the B-group) but lately the government seems to emphasize active participation also of the private enterprises.[10] Finally, in the current Chinese health care system individual payments play a huge role. Although the individual contribution to the social scheme is rather limited, there is a huge additional out-of-pocket expense for the individuals since the social schemes are inadequate to cover all necessary expenses.

The total expenses of the current health care system as well as the allocation between government, social funds and personal expenses, is shown in Table 2.1.2. below.

Table 2.1.1. *Total Health Care Expenditure in China.*

	1980	1990	1995	2000	2002	2003	2004
Total Health Expenditure(100 million 1980 yuan)	143.2	354.7	584.7	1226.6	1550.1	1741.8	1932.6
Total Health Expenditure(100 million yuan) current prices	143.2	747.4	2155.1	4586.6	5790.0	6584.1	7590.3
Total health expenditure in % of GDP	3.17	4.03	3.69	5.13	5.51	5.62	5.55
Government Health Expenditure in % of total health expenditure*	36.2	25.1	18.0	15.5	15.7	17.0	17.1
Social Health Expenditure in % of total health expenditure**	42.6	39.2	35.6	25.5	26.6	27.2	29.3
Personal Health Expenditure in % of total health expenditure***	21.2	35.7	46.4	59.0	57.7	55.8	53.6
Per Capita Health Expenditure	14.51	65.4	177.9	361.9	450.7	509.5	583.9
Per Capita Health Expenditure of Rural to Urban		1:4.1	1:3.6	1:4.0	1:3.8	1:4.0	1:4.2

* Government expenses include administration costs, health expenditures for government employees (civil servants in the A-group) and the costs of providing health care corresponding to the budgets.
** Social health expenditure includes coverage of personnel from public institutions (included in the A–group) as well as group B and C. It also includes government budget imbalances and private insurance.
*** Personal health expenditure is individual out-of pocket expenses.

Source: Chinese Ministry of Health.

Table 2.1.2. Total Health Care Expenditure in China

Total expenditure has increased considerably during the last two decades (with a factor 13 in fixed prices) which may be seen as a consequence of the health care reform itself as we shall discuss in Section 2.3.2 below (see also Blumenthal and Hsiao 2005). Expenses in percentage of GDP have remained relatively stable due to China's high growth rates. Moreover, there is a substantial difference between per capita expenses in rural and urban districts with urban expenses being four times higher than rural expenses — a ratio that has been relatively constant. As a result of the reform the relative size of government health expenditure as well as the social health expenditure (which includes expenses of state owned enterprises) has

[9] Collectively owned enterprises are mainly found in the rural areas for historic reasons.
[10] Cf., e.g. *Announcement about Expansion of Social Insurance Coverage in 2004*, Tianjing City Labour and Social Security Bureau, *Tianjing Policy News* March 31 2004. (http://www.tjzb.org/system/2004/08/09/000044206.shtml)

decreased significantly. The direct government expenditure dropped from 36.2% in 1980 to 17.1% in 2004 while the social health expenditure dropped from 42.6% in 1980 to 29.3% in 2004. Meanwhile the private out-of-pocket part has drastically increased from 21.2% in 1980 to 53.6% in 2004. On top of this, individual contributions to the social health expenditure have been introduced. As indicated in Table 2.1.1 above, expenses of the A-group is divided according to whether it concerns civil servants or personnel of public institutions. For the civil servants health care expenses are registered under total government expenses, which primarily are covered by taxation. For personnel of the public institutions, the health care expenses are partly covered by the institutions themselves and are consequently registered under social health expenditure.

A detailed picture for the B-group is presented in Table 2.1.3 below. The number of people included in this scheme has been steadily increasing since the first experiments in the early 1990s until 2006 where a total of 157.3 million people are covered (with three times as many working as retired members). As mentioned earlier, the scheme consists of both an individual account (with an income corresponding to 3.8% of the total liability wage[11]) and a social plan (with an income corresponding to 4.2% of the total liability wage) but the actual burden is 2% for the individual and 6% for the enterprise. Both the individual account and the social plans are administered by the provincial government. As shown in Table 2.1.3, the income is larger than actual expenses concerning both the individual account and the social plans hence creating a positive accumulation. However, the data in Table 2.1.3 are aggregate data and expenses for the social plans may differ significantly between regions. In particular, one might expect to find positive accumulation in rich costal regions whereas it is not unusual to find negative accumulation in poorer regions.

Table 2.1.3. *New urban comprehensive medical care scheme (B-group)*[12]

Year	Working people (thousand)	Retired people (thousand)	Gross income of individual account (million Yuan)	Gross expenses of individual account (million Yuan)	Gross income of society plans (million Yuan)	Gross expenses of society plans (million Yuan)	Gross income (million Yuan)	Gross expenses (million Yuan)	Accumulation in society plans (million Yuan)	Accumulation in individual account (million Yuan)
2006	115800	41520	70600	56000	104100	71700	174700	127700	107700	67500
2005	100220	37610	58500	46400	82000	61500	140500	107900	75000	52800
2004	90450	33590	51800	39800	62300	46400	114100	86200	55300	40500
2003	79720	29270					89000	60780	37900	29100
2002	69260	24740					60780	40940		
2001	54710	18150					38400	24400		

Source: annual statistic reports 2001-2006 from the Chinese Ministry of Labor and Social Security.

Concerning the C-group there is no universal coverage, but a series of local experiments under the "new rural cooperative medical care scheme". In 2005 there was a total of 678 experiments covering 176 million (22%) of the rural population with a total income of 10.95 billion yuan and a total expense of 6.18 billion yuan. Of the total income, central government pays 10.24%, local government pays 47.44% and communities (social networks) as well as individuals pay 42.3%. It seems that a large part of the central government expenditure is covered by income from the welfare lottery — until September 2005 it contributed 300 million out of a total central government expenditure of 540 million. Since the scheme is rather new, the financing role of

[11] See footnote 5.

[12] In principle, these data may include part of the A-group because officially some A-group members are regulated by the new urban medical care scheme but no official information is available.

the central vs. the local government is still not clear and the central government is not committed to any formal arrangement with the provincial governments.

Although we have data for total expenses covered for the C-group there is no indication of burden sharing and furthermore, additional out-of-pocket expenses are not registered. Consequently, it is very difficult to obtain a general picture of the actual burden sharing between farmers, communities and local government. However, in specific regions more detailed information is available as in the case of the Shandong province.[13] Here the provincial government designed the subsidy scheme according to the village government's financial situation: for the five most prosperous areas (Jinan, Zibo, Dongyin, Weihai, Yantai) there is a provincial government subsidy of 8 yuan per person per year, this subsidy is 24 yuan for the six poorest areas and 12 yuan for those in between. Since the total subsidy is 30 yuan per person per year, the village government covers the residual. Finally, the farmers themselves pay 10 yuan per person per year to the village committees (social pooling at a community level). This scheme covers 40.63 million farmers (66.98%) with a total provincial government subsidy of 360 million yuan. Hence, contrary to the B-group, where social pooling takes place at a city or provincial level, social pooling for C-group is limited to take place at a village level.

Summing up, we are now able to produce an estimate of the burden sharing between the government, enterprises and individuals at a national level. Considering the burden, we have data for both total health expenses and income for the social schemes. Since income of social schemes represent the actual expenses for individuals and enterprises, we shall use these amounts along with direct out-of-pocket expenses and expenses for the government. In this way we obtain the allocation in Table 2.1.4 using 2004 data:

Table 2.1.3. *Burden sharing.*

		2004	%
Individuals	out-of –pocket	406.84 billion	56
	contribution to social scheme of B-group	28.53 billion	
	contribution to social scheme of C-group	4.63 billion*	
	private insurance	0.026 billion	
Enterprises***	contribution to social scheme of B-group	85.58 billion	11
The government	total expenditure	129.79 billion	33
	residual**	131.54 billion	

* 2005 data which is only one available

**the residual is the gap between adjusted total health expenditure of 787 billion (adjusting for the difference between income and expenses of the urban scheme) and the inflow in total of 656.36, which is the sum of the income of social schemes as well as the actual expenditure of individual and government. It covers extra investment to health institute and health expenditure for the employees in public institutes.

***Due to the fact that some members of the A-group may be included in the data of Table 2.1.2 the share of the enterprises may be overestimated (while the government is underestimated).

[13] Bureau of Health of Shandong province – 2006 data.

Table 2.1.4 shows that the health care burden of the enterprises is rather modest compared to the individual burden. In a broader perspective, though, there has been arguments stating that the total social burden of the enterprises, which includes pension and unemployment insurance, is too high (around 30%), see, e.g. Dongqiang and Lin (2004) and Ying (2004).

2.2 Health care benefits

Considering the B-group, the general principle seems to be that outpatient treatments (according to an official catalogue) are covered by the individual account and inpatient treatments (according to an official catalogue) are covered up to a certain limit by the social insurance plan. The actual details concerning the coverage as well as the list of approved treatments and drugs vary among provinces. In order to control the actual expenses it is common that the scheme includes some upper and lower threshold determined by the local government, outside of which the individual is left to pay out-of-pocket. Moreover, the list of approved treatments and drugs may of course be used to control the total expenses of the system.

It is worth noticing that rights are generally restricted to a particular province. Therefore, the individuals face a substantial transition cost since they cannot use neither their individual account nor the social insurance across provinces. Consequently, in some regions with a high degree of migrant labour many of the workers receive only part of their benefits. For instance, in the Shenzhen city area, floating labour joins only the social pooling part of the scheme and therefore all outpatient visits are out-of-pocket expenses for this group.

In some of the early experiments, the so-called Liang Jiang type of scheme was used. Here there is no difference between inpatient and outpatient treatments but a specified payment channel defining when expenses (above a certain lower threshold) are covered by the individual account, social account and out-of-pocket: first the individual account covers expenses and if this is insufficient the individual will pay out-of-pocket up to a maximum of 5% of the average wage, then the social plans will reimburse a gradually decreasing percentage of the remaining amount. Originally this scheme was intended to limit the costs of health care by limiting the element of social pooling, but was criticized for introducing too heavy a burden on the individual. Therefore, today most provinces have changed to the system described above.

Looking at the benefit side of the system, the A-group is basically fully covered. In particular, employees of public sector institutions are entitled to hospital bed expenses, medical inspection expense, drugs expenses, cost of treatments, operation fees, expenses from recovery services, first aid expenses, organ transplant expenses, etc. Note that, because there is a difference between the way that the health expenses are financed between civil servants and personnel of other public institutions, there may, in practice, be differences in the coverage between these groups, but in principle they are entitled to the same benefits.

As mentioned in Section 2.1 above, the conditions of the A-group are gradually changing and the Beijing area has been among the first to implement those changes. According to "The suggestion about implementation of medical care subsidy to the officials" from 2003, public servants who have been involved in the basic medical care system (including the retired and people who no longer work in the government after the government institution reform, but are still in the public servant personnel system) enjoy the benefits of the B-group; they are entitled to additional subsidies, which cover expenses beyond the maximum limitation of the services included in the basic medical care drug and treatment catalogue (i.e., expenses paid by individual, which are below the deduction line and expenses of privilege treatment for

high ranking officials).[14] Due to the subsidy, the level of compensation, in effects, equals that of free medical care.[15]

For the C-group there are no uniform conditions. In some regions there is basically no coverage and in others, like in the case of Jiang Shan, where individuals carry the major part of the burden (i.e. 30 yuan per year out of a total on 52 yuan), there is some element of coverage. In particular, farmers receive 10% coverage of outpatient visits to town hospitals (treating only less serious cases) without limits. Moreover, they receive inpatient coverage for expenses above 500 yuan with an increasing percentage of coverage in fixed ranges.[16]

2.3 Health Care Providers

In China, government owned city hospitals form the backbone of urban health service delivery. These hospitals are ranked at three levels according to medical criteria and each level again contains three classes. To some extent this ranking matches the three layer governmental structure presented in Figure 2.1.1. That is, top hospitals are typically administered by the Ministry of Health and thereby financed directly by the central government, while level 2 and 3 hospitals are administered by the provincial government and so forth. Table 2.3.1 below shows the total number of hospitals (not just public hospitals) according to the three level ranking. There are a relatively small number of hospitals at top level while more than half are outside the ranking system.

Table 2.3.1: *The total number of hospitals according to the three level ranking*

	Sum	General Hospital	TCM [1] Hospital	TCM-WM [2] Hospital	Minority Hospital[3]	Specialized Hospital
Sum	18703	12982	2620	194	195	2682
First Level	946	633	152	15	2	144
1st Class	594	388	103	11	1	91
2nd Class	314	225	46	4	1	38
3rd Class	38	20	3			15
Second Level	5156	3557	1145	36	42	374
1st Class	2744	1838	628	23	18	179
2nd Class	2277	1626	438	12	19	181
3rd Class	135	93	21	1	5	14
Third Level	2714	2371	105	21	13	199
1st Class	2042	1843	62	12	7	115
2nd Class	509	418	24	6	5	55
3rd Class	163	110	19	3	1	29
Others	9887	6421	1218	122	138	1965

Source: Chinese Ministry of Health

[14] In the Beijing area, the public fiscal budget is only around 5% of total salary of last year, according to official documents, but obviously it cannot cover the full expenses. It seems that no reliable data on true expenses are available.

[15] In particular, inpatient expenses beyond maximum limitation, above 50 thousand per year are covered with 95% compensation. Expenses below 50 thousand yuan per year are covered with 90% compensation. Individual burden of inpatient expenses (including individual account expenditure) are covered with 95% for retired officers and officers at the rank of Chief of Bureau and above, and with 90% otherwise. Outpatient expenses (including individual account expenditure) are covered with at least 90% compensation if the expenses exceed 1,300 yuan per year.

[16] 20% in the range [500–1,000] yuan, 35% in the range [1,000–2,000] yuan, 40% in the range [2,000–5,000] yuan, 50% in the range [5,000–10,000] yuan, 60% in the range [10,000–20,000] yuan and finally 70% in range 20,000 yuan and above with a total maximum benefit level of 20,000 yuan. In case the individual chooses a higher level hospital, these percentages decrease. The full details of the plan are available at www.cncms.org.cn .

At lower levels, like town or village, people are typically referred to a local community hospital or a medical care centre. Table 2.3.2 shows the different types of providers along with the total number of visits in rural areas. Even though the number of medical institutions seems quite high, these institutions are typically rather small and perform only a very limited range of treatments. In terms of capacity, the number of beds per 1,000 persons in hospitals and health centres is much higher in urban areas (3.56) than in rural areas (1.43).

Table 2.3.2: *Health Care Providers in Rural Area*

		No. of providers	No. of visits
County	General hospitals[4]	2009	
	Maternal and child care service center	1526	
	Sanitation and anti-epidemic station	1586	
Town	Community medical care center	40907	59 million
Village	Medical care centre	583209	97 million

Source: Chinese Ministry of Health

For historical reasons many large state owned enterprises still operate their own hospital. The number of such hospitals is included in Table 2.3.1. In fact, due the historical development, ownership of hospitals and other types of medical institutions is not easily identifiable since many combined forms coexist. Table 2.3.3 below records the number of institutions according to ownership type.

Table 2.3.3: *Number of institutions according to ownership*

	State owned	Collectively owned	Joint operation	Private	Other
Total	93398 (30.96%)	44469 (14.74%)	8691 (2.88%)	143183 (47.47%)	11896 (3.94%)
Hospital	13975	1508	133	2027	1060
Community health centre	17128	4619	7572	1214	2131
Health centre (urban, township)	25939	15121	34	271	329
Outpatient department	2209	997	59	2043	588
Clinic	31028	22191	893	139671	7778
First-aid station	131	5	0	0	5
MCH centre	2988	28	0	0	5

Source: Chinese Ministry of Health

There is no system of General Practitioners (GPs), but each individual chooses directly among appointed service providers. In urban areas patients typically go directly to a hospital outpatient department and this department performs the function of the GP. In rural areas patients may also go to medical care centres. There is a possibility to be transferred within the system (both horizontally and vertically) in accordance to the needs of the patient, though in case of vertical transfers this means that the patient will receive a reduced coverage, see Section 2.2.

To indicate differences in the type of treatment that is received in urban versus

rural areas one might consider the general education level on hospital versus township health care centres as in Table 2.3.4 below. It is striking that only 3.8% of the personnel at hospitals are in fact physicians (with university master level and above) while the vast majority act as doctors but only have an education at BA level. Also, in the rural area health centres there are no professionally trained physicians.

Table 2.3.4: Percentage of health care personnel by educational level in 2002

By Educational Level	Hospital	Township Health Center
Doctor's Degree	0.8	0.0
Master's Degree	3.0	0.0
University	38.8	2.9
Junior College	33.2	24.9
Secondary Technical School	20.7	56.5
High School and Below	3.6	15.8

Source: Chinese Ministry of Health.

Considering the workload of physicians it appears that top hospitals produce more treatments and inpatient days than lower ranking hospitals (see Table 2.3.5 below). At first glance this seems counter intuitive since one might expect to find more complicated (and thereby more resource consuming) treatments at top hospital level. However, one explanation could be that patients have the option to go to a top hospital and do that in cases of standard treatments, which they can afford. Therefore, top hospitals perform a lot of minor surgery and other types of standard treatment.

Table 2.3.5:

	workload for physicians			
Hospitals	treatment per physician per day		inpatient days for per physician per day	
financed at:	2005	2004	2005	2004
ministry level	7.8	7.3	2.3	2.2
province level	6.6	6.2	2.1	2.0
big city level*	5.7	5.1	1.9	1.7
small city level	5.0	4.8	1.4	1.3
county level	4.3	4.0	1.4	1.3

* provincially administered city

Source: Chinese Ministry of Health

Compared with many western systems it is furthermore striking that every Chinese hospital has an integrated pharmacy taking care of the provision of drugs although, in the big cities, more and more independent pharmacies appear. The obvious moral hazard problems in this connection will be discussed in Section 2.3.2 below.

Treatment and drug charges are highly regulated. For treatments on the approved list as well as all prescription drugs, prices are regulated either by a fixed fee schedule or by a guided price determined by the government. In case of a guided price, the government determines some upper limit for the markup (10 – 15% for drugs and 5% for high-technology procedures). Around 40% of the drug market is regulated. Non-prescription drugs are only market priced if not on the approved list. Market priced drugs account for the remaining 60% of the total drug market. Treatments not on the approved list are market priced like for instance, births.[17]

2.3.1 Financing the service delivery

Hospital income basically originates from three sources: government subsidies (primarily for covering fixed costs such as buildings, equipment and wages), patient out-of-pocket expenses and individual account payment and reimbursements from the social insurance plans.

Concerning the reimbursements from the social insurance scheme, many hospitals went from a fee-for-service based reimbursement scheme to a prepayment scheme similar to a monthly budget after reforms in 1997.[18] Based on what the hospital received in a given month the previous year, they are pre-paid 90% of this amount in the current year with the promise of an additional 10% if the hospital maintains its quality level (according to the yearly quality review). Hospitals are further compensated *ex post* for unexpected cost factors according to an overall judgment. The specific details of the contracts are somewhat complicated, see Yip and Eggleston (2004). The prepaid scheme can be compared to the situation before 1997 where the reimbursements were based on fee-for-service. In order to compensate the hospitals for the reduced state subsidies following the economic reforms, hospitals were allowed to charge fees that exceeded average costs on certain types of high-technology tests and procedures as well as prescription drugs. As to be expected this led to serious cost inflation since it gave hospitals the incentive to over prescribe drugs and high-technology procedures. Basically, this is the reason for the present day structure of the insurance system and the provider payment reforms (the Hainan reforms) initiated in 1997. Yip and Eggleston (2004) demonstrate that the prepayment scheme apparently has had a positive effect slowing the rate of growth of expenditures, especially for expensive drugs and high-technology procedures.

To obtain a general overview of income and expenditure data for hospitals consider Table 2.3.6 below. It appears that on average medical treatment and drugs are equally important income generators for all types of hospitals, but typically (on average) profits are negative for medical treatments while they are strictly positive on drug sales (again independent of the type of hospital). Of course these numbers may conceal substantial differences between individual hospitals[19] but the overall picture seems to be in line with the fact that the government regulates treatment prices below actual costs and that the hospitals are forced to compensate through profits made on prescription drugs.

[17] Cf. China Drug Control Law (from 2002) and China Price Control Law (from 1997).

[18] Typically modeled over the Hainan experiment.

[19] To get an impression from an individual hospital we may consider the following case from Shaoxing city in Zhejiang province: Hospital income per year is 222,457,000 yuan, which consists of medical income of 54,520,000 yuan, drug income of 99,107,000 yuan and some (unspecified) residual income of 68,830,000 yuan. Compared to the average distribution (in Table 2.3.6 above) we see that drug income is particularly high constituting half of the total income. Meanwhile, hospital expenditure per year is 205,667,000 yuan consisting of medical expenditure of 119,555,000 yuan and drug expenditure of 84,488,000 yuan, which are in accordance with the average picture in Table 2.3.6 above. Looking at average medical expense per outpatient (Yuan) the total amount of 135.80 yuan is shared as 81.70 yuan for drug, 20.30 yuan for examination and 12.30 yuan for diagnosis. Average medical expense per inpatient is 7,610.90 yuan which is shared as 3,176.70 yuan for drug, 406.30 yuan for examination, 1,633.60 yuan for treatment and 550.40 yuan for surgery.

Table 2.3.6: Income and expenditure of hospitals of health sectors in 2005

	General hospital[1]	Hospital of MOH	Province Hospital	Hospitals of City at prefecture	Hospital of City at County level	County Hospital
Income per Hospital (million yuan)	55.756	798.927	319.949	95.653	31.510	20.443
of which :						
Business Income	51.749	758.919	300.942	87.660	29.486	18.786
Medical Income	26.857	399.482	159.093	45.465	15.006	9.636
Drug Income	23.836	340.573	136.635	40.580	13.767	8.705
Other income	1.056	18.864	5.215	1.615	0.713	0.443
Expenditure per hospital (million yuan)	53.457	775.454	304.785	91.438	30.462	19.643
of which:						
Business expenditure	51.749	752.122	295.388	88.460	29.710	18.839
Treatment expenditure	30.200	453.379	172.631	51.818	17.193	10.829
Drug expenditure	20.961	292.368	119.395	35.664	12.158	7.776
Other expenditure	0.588	6.375	3.363	0.978	0.358	0.234
Average medical expense per outpatient (yuan)	126.9	247.1	192.5	130.7	105.2	84.2
of which: for drugs (yuan)	66.0	136.7	102.0	69.3	53.5	41.0
Average medical expense per inpatient (yuan)	4661.5	12650.9	9871.2	5452.4	3380.9	2266.5
of which: for drugs (yuan)	2045.6	5089.9	4186.1	2374.6	1544.6	1057.8
for examination & treatment	1230.6	3460.6	2602.5	1501.2	864.5	550.8

Source: Chinese Ministry of Health (www.moh.gov.cn)

2.3.2 Provider incentives

To understand hospitals incentives it is necessary to understand the conditions under which they are actually working. To some extent, public hospitals are independent units, but still receive government subsidies primarily to cover part of their fixed costs (such as buildings and capital). Since the hospitals are not fully sponsored by the government, they gain some freedom to pursue other than public interests. Meanwhile, the hospitals are not privately owned profit maximizing entities, so they actually end up being primarily pursuing staff interests; that is, although not caring about cost minimization they are still required to obtain a certain level of profitability. There are many indicators that point towards the management of hospitals pursuing staff interests. For instance, various sorts of inefficiencies are often debated, such as a decreasing workload of doctors and low utilization rates of capital (beds and equipment), etc. (Wang, 2004). Moreover, it is commonly known that there is a widespread tendency of over-treating patients using too many (and unnecessary) drugs, high-technology tests and procedures.

For example, in the Shandong province, a retired provincial government official (that is, A-group member), Wang Jie, stayed in a top ranking hospital for 22 days being treated for

pneumonia. In the end he died and total charges reached the striking figure of 20,000 yuan.[20] Interestingly, it turned out that he did not use all the prescribed drugs since his family members obtained more than 100 unopened drug packages from the hospital after his death. Medical records show that he was prescribed 171 different types of drugs and, as the bill is paid by the day, the maximum charge for a single day reached 5,576 yuan.[21]

It is also well known that patients usually pay so-called "red-bag money" to doctors treating their case (to be seen as very big tip meant to ensure good service) and that octors furthermore obtain commission from their drug sales. In fact, more than 90% of marketed priced drugs are sold with commission implying that the doctors have incentive to choose maximum commission drugs among those with the same curative effects. For example, a given tumor drug sold at a hospital pharmacy at a price of 2,000 yuan includes the actual expense for the hospital of only 100 yuan and the doctors commission of 500 yuan – leaving both a good commission to the doctor and a good profit for the hospital. Both "red-bag money" and commission are examples of hospital management accepting that doctors are quite powerful in making their own production decisions pursuing their own interests. It could also be viewed as part of a motivating payment scheme chosen by the hospital, but in connection with low degrees of efficiency it seems more likely to be the result of the former.

Together, inefficiency and employee power creates high production costs, which again pushes treatment and drug prices upwards. The highly limited state subsidies are further fueling this effect. Adding to that, in competing for State subsidies as well as for general demand, hospitals further increase production costs since typically more subsidies and patients go to hospitals with a high level of service and technological equipment. The final result is that public hospital prices exceed private hospital prices. To finance the purchase of high-technology medical devices and buildings, hospitals typically have huge debts to State banks.[22] Since the banks are also State owned, the hospitals are reluctant to pay back their debts because in the end the government cannot justify closing down hospitals.

Considering the relation between the service provider and the social plans, the change from a fee-for-service scheme to a pre-payment scheme obviously has changed the incentives of the provider. Under fee-for-service the hospitals lack incentive to reduce overall production costs because the reimbursement is based directly on their activity level. Meanwhile, a pre-paid 90%-budget induces some element of cost-consciousness by introducing the supply side cost sharing, although in principle the 90%-budget limits the residual saving to a maximum of 10%. The positive effect on overall costs is also partly neutralized by the fact that hospitals face a ratchet effect in their efforts to save on costs — see Yip and Eggleston (2004).

In the case of the drug market, the fact that hospitals and pharmacies are integrated units strongly limits the effect of government price regulation. In general prices on drugs are considered to be too high due to the situation mentioned above. However, when the government tries to lower drug prices of market priced drugs, the room for pharmaceutical companies to give discounts to hospital pharmacies and doctors will be smaller. As a result of this, doctors tend to substitute to another type of drug and the pharmaceutical companies will respond by changing the drug (either changing name, or dosage, or package) so that it will appear as a new type of medicine which may be market priced again (until it ends up at the regulated list). This type of product change is difficult to be disclosed by the government price

[20] For comparison, in 2005 the average yearly income was 16,614 yuan per capita in the urban area of Shandong province. Source: Statisticss Yearbook of Shandong 2006, *Shandong Statisticss Information Net* http://www.stats-sd.gov.cn/tjsj/nj2006/NJ04/HTML/0415.htm

[21] A family member of Wang said, "It is hard for a person without medical knowledge to tell which drug should be used. But it is obvious that doctors treat a given sickness with multiple drugs with the same curative effect." Source: http://www.southcn.com

[22] As an example, cf. "Huge debts of local public hospital in Dongbei area", Health News November 13 2007 http://health.sohu.com/20071113/n253230097.shtml (in Chinese)

bureau. In fact, from 1998 to 2006 the government implemented 17 times drugs price reduction without success.[23] The average scope for price reduction increased from 15% to 40% and the loss for the pharmaceutical companies for each reduction amounted to billions of yuan. Not surprisingly, the regulation of the drug market has lead to a heated debate in China where the pharmaceutical industry complains about a loss of profitability and argues for free market prices, but the public opinion seems to be that prices are still too high and need more government regulation.

3. Main Problems

Having been trough the main structure of the Chinese health care system, it is clear that the system faces many acute problems and serious future challenges. Even though the system is constantly trying to adapt to population needs and improve its performance, there is official recognition of fundamental problems like insufficient coverage and lack of expenditure control.[24] The central government is aware of the necessity of increasing substantially its investment in health care—see Hsiao (2007). As we have seen above, even official data seems to indicate rather serious problems, which further more tend to interact and create a complicated situation for the governing authorities. To briefly sum up, the main problems concern:

Coverage: In effect the current system design excludes the poorest and most vulnerable groups, especially a large part of the rural population. However, the system seems to change towards an urban and a rural system (like now) but with global coverage including people outside the labour market — adding a new scheme to the B-scheme which includes children, unemployed persons, etc. But there are no details yet about financing it.[25]

Pooling level: Even when people are covered, there may still be problems related to the actual pooling level. Typically the individual and social accounts are city or region specific. This means that if a given person is covered in one city or region and moving to another he/she does not have the right to coverage in that city or region. Obviously this is a huge problem for the growing migrating labour force but in principle it concerns everyone.

Limited access: Looking at who actually receives benefits in the system, it turns out that there are huge inequalities. In reality many people in need of medical services are left without the possibility of receiving help even though they are covered by the official system. This is because it typically requires considerable additional out-of-pocket expenses to receive medical care. Often insurance premiums are low resulting in limited benefit coverage, in terms of low reimbursement rates (20-30%) for both outpatient and inpatient services (see Hu 2004) and this creates highly limited access. Even official data indicates that there are serious problems. For example, the ratio between people who should receive a medical service but did not was 36.4% in 1993 and has risen to 48.9% in 2003. In particular, according to the third National Health Service Investigation by the Chinese Ministry of Health (2003), for rural areas this ratio was 63.7% in 1998 and has risen to 75.4% in 2003.

Provider efficiency: Due to price regulation and lack of a well-functioning referral system, patients prefer going to top ranking hospitals producing long waiting lists while at the same time there is free capacity in lower ranking hospitals. This obviously gives a bad utilization of

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[23] Cf. "The puzzle of 17 times No Effective Drug Price Deduction", Xinhua Net, October 31 2005. http://news.xinhuanet.com/fortune/2005-10/31/content_3707704.htm (in Chinese)

[24] Cf. "Four Most Serious Problems of China Medical Care Insurance Reform", Xinhua Net, July 16 2005. http://finance.sina.com.cn/money/insurance/bxsd/20050706/17251767967.shtml (in Chinese). http://news.xinhuanet.com/politics/2007-07/25/content_6429758.htm (in Chinese).

[25] Cf. *Policy Explanation from Ministry of Labour and Social Security: Establishment of Basic Medical Insurance System for All Urban Inhabitants*, Xinhua Net July 25, 2007.

the available capacity of the system. Moreover, at all levels of government, investment seems to be focused on top-ranking hospitals only to make the problem worse.

Cost inflation: Because of price regulation combined with lack of public funding, the hospitals are allowed to make a profit on certain high-technology treatments and drugs. Due to serious moral hazard problems, hospitals have incentives to divert activity into profit giving areas creating substantial cost inflation.

Credibility problem: People (especially in rural area) are typically distrustful of the local government insurance fund management and worried that their insurance premiums might be diverted to other uses. Moreover, the central government launches many different experiments in different regions and nobody knows which system will finally be adopted. Obviously this creates much confusion as to the functioning of the final system and consequently some reluctance and distrust to the current one.

The problems of coverage and pooling level are in many ways interrelated. One way of solving the coverage problem would be to organize the social pooling on a national level, which in effect leads to a national health care system. However, such a solution seems difficult to realize because of huge regional differences in China. For instance, in poorer regions the current system may not even be fully implemented and these regions will further typically lack the information systems necessary to make the health insurance plans operational. Therefore, in practice the system must consist of regional risk pooling. While it is relatively obvious that the individual accounts should follow people when they move between regions, it is less obvious how the accounts connected with social pooling should be allocated and how the local authorities should cooperate on this issue. The credibility problem seems to increase these difficulties because people lack confidence in the current system, feel uncertain about future benefits, especially the ones who expect future migration among cities and are therefore reluctant to increase the coverage.

The many instances of provider inefficiency push cost inflation and thereby aggravate the problem of limited access simply because few people can afford treatment as this typically requires too large additional out-of-pocket expenses. It is somewhat ironic that price regulation ensuring cheap basic treatment, which was meant to promote access, seems to have had the direct opposite effect due to wrong provider incentives.

4. Conclusion and Future Challenges

Looking at future trends, the Chinese health care system seems to face a substantial increase in demand. There are at least three main reasons for that.

Firstly, the present coverage is very limited — even the most optimistic estimate is that the current system covers less than one quarter of the total population (Liu 2004) — and since the government intent to change the system from being based on job function to being based on citizenship in urban areas, this change alone in the number of people covered is likely to increase future demand.

Secondly, the "one child policy" has at least two crucial effects, namely an aging population and a future inability of the family to take care of the elderly. Obviously an ageing population will demand more health care resources simply because elderly persons require more health care. Moreover, since the burden of the elderly will increase for the family household, the younger members will no longer be able to take care of the elderly themselves. Therefore, they will be forced to outsource this function requiring the professional services of public and/or private nursing homes.

Finally, with the rapidly growing middle class and good economic conditions in general, demand for quantity as well as quality of health care is likely to increase drastically.

With the current problems of the Chinese health care system (e.g. lack of public funding

and educated health care personnel), it is obvious that this increase in demand cannot be met directly by the public health care system. This leads to further substantial cost inflation and increased pressure on top ranking hospitals as well as increased pressure for the introduction of private providers.

Moreover, the supply side faces a dilemma: on the one hand, public health care resources are obviously insufficient and most public hospitals are in urgent need of investments; on the other hand, according to the current regulation, private capital is not allowed to be invested in the public health care sector.[26]

Solutions to this dilemma are fiercely discussed in China at the present moment. Typically, public hospitals would like to lease buildings and equipment financed by private capital but the private investors on the other hand want to be involved more directly in the running and management of hospitals.[27] Especially foreign investors have shown great interest for entering the Chinese health care market (for example, according to the survey of Chinese Hospitals Holdings Ltd, there are approximately 60 billion US dollars of funds in attention to China's medical market). Facing the combination of the hospitals urgent need of increased funding and the substantial interest shown by private investors to enter the market given acceptable conditions, the Chinese government now seems ready for a process opening up for private capitalization. According a former health minister, the government intents to encourage foreign capital to enter various large city hospitals subject to a 70% limit of ownership but no official plan is announced yet.

5. References

Blumenthal, D. and W. Hsiao (2005), Privatization and its discontents – the evolving Chinese health care system, *The New England Journal of Medicine*, 352, 1165-1170. Development Research Centre of the State Council & WHO (2005), Chinese Health Care system Reform, Research report. Dong W. (2006), Can health care financing policy be emulated? The Singaporean medical savings account model and its Shanghai replica, *Journal of Public Health*, 28, 209-214.

Eggleston K., L. Ling, M. Qingyue, M. Lindelow and A. Waagstaff (2007), "Health service delivery in China: A literature review", *Health Economics*, forthcoming.

Hu T-W, M. Ong, Z-H. Lin and E. Li (1999), "The effects of economic reform on health insurance and financial burden for urban workers in China", *Health Economics*, 8, 309-321.

Hu T-W. (2004), "Financing and organization of China's health care", *Bulletin of the World Health Organization,* 82.

Hsiao W. (1995), "The Chinese health care system: lessons for other nations", *Social Science and Medicine*, 41, 1047-1055.

Hsiao W. (2007), "The political economy of Chinese health reform", *Health Economics, Policy and Law*, 2, 241-249.

Liu, Y. (2004), "China's public health care system: facing the challenges", *Bulletin of the World Health Organization*, 82, 532-538.

Qiu, Y. (2004), "Opinion about urban sharing of enterprise of social insurance fee", *Economists*, 6 (in Chinese).

[26] Cf. Administration of State asset of State owned non-profit organizations, 2006.

[27] For example, on October 27 2007, at a convention concerning the financial situation of hospitals, a director of a local level II public hospital argued that leasing hospital buildings financed by private capital would greatly improve their situation. However, the president of Chinese Hospitals Holdings Ltd. Jiang Tao responded: "*We are not real estate investors; we would like to be involved in hospital management through acquisitions holding. It's not feasible to invest without private capitalization*."

Yip W. and K. Eggleston (2004), "Addressing government and market failures with payment incentives: Hospital reimbursement reform in Hainan, China", *Social Science and Medicine,* 58, 267-277.

Yip W. and W. Hsiao (1997), "Medical savings accounts: Lessons from China", *Health Affairs*, November-December issue, 244-251.

Wang H., L Zhang, W. Yip and W. Hsiao (2006), "Adverse selection in a voluntary rural mutual health care health insurance scheme in China", *Social Science & Medicine*, 63, 1236-1245.

Wang, S. (2005), "Crisis and challenge of China public health system", *Comparative Studies,*

Wei, D. and M. Lin (2004), "The development and complete of Chinese social security system", *Chinese Finance Information*, 19 (in Chinese).

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