The cost of coverage: rural health insurance in China

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China has undergone great economic and social change since 1978 with far reaching implications for the health care system and ultimately for the health status of the population. The Chinese Medical Reform of the 1980s made cost recovery a primary objective. The urban population is mostly protected by generous government health insurance. A high share government budget is allocated to urban health care. Rural cooperative health insurance reached a peak in the mid-1970s when 90% of the rural population were covered. In the 1980s rural cooperative health insurance collapsed and present coverage is less than 8%. The decline has been accompanied by reports of growing equity problems in the financing of and access to health care. This article is the first in a four-year study of the impact on equity of the changes in Chinese health care financing. The article examines the relationship between rural cooperative health insurance as the explanatory variable and health care expenditure, curative vs. preventive expenditure and tertiary curative care expenditure as dependent variables using a natural experimental design with a ‘twin’ county as a control.

The findings support the hypothesis that cooperative health insurance will induce higher growth of health care expenditure. The findings also support the hypothesis that cooperative health insurance will lead to a shift from preventive medicine to curative medicine and to a higher level of tertiary curative care expenditure. The empirical evidence from the Chinese counties is contradicting World Bank health financing policies.

Background
Since 1987 the World Bank has promoted a health finance policy package consisting of user fees, health insurance, privatization and decentralization. China implemented a Medical Reform in the 1980s much in line with the World Bank policy recommendations.

China has undergone great change during the recent 15 or so years - the Deng Xiaoping era. Change is evident in the GNP growth, income distribution, health care utilization and in the health status of the population. GNP growth has outperformed all other countries in the world, present and past. It is generally accepted that the economic level of a society, alongside female education and well-designed public health interventions, is one of the strongest determinants of the health status of the population. Thus, it could have been expected that the health indicators of China would improve sharply over the same period.

The health indicators have improved in the big cities of China, but in the countryside, housing the vast majority of the population, signs of improvement are few. Instead, concern1 has been expressed that some of the previous gains in health status may be lost. The differences between regions, and between urban and rural populations, are wide and widening. In a country of China’s dimensions average data are not sufficient to understand the multi-faceted reality. Yet, it is alarming to note that the average infant mortality rate (IMR) was officially recorded at 34.7 per 1000 in 19812 and at 37.0 in 1992.3 Even more alarming is the growing difference in IMR between the poorer rural areas and the major cities in China, which was of a factor of 4.6 or mirroring the difference in mortality levels between Lesotho and Hungary (Table 1).

According to UNICEF the true IMR for China is around 52 per 1000 (1993).4 A survey of the health services and the health status of the population in
Rural health insurance in China

Table 1. Infant Mortality Rate – Trends of inequity in China (mortality within first year of life per thousand born)

<table>
<thead>
<tr>
<th></th>
<th>1981*</th>
<th>1992**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole China</td>
<td>34.7</td>
<td>37.0</td>
</tr>
<tr>
<td>Major cities</td>
<td>15.8</td>
<td></td>
</tr>
<tr>
<td>Poor rural counties</td>
<td>71.8</td>
<td></td>
</tr>
</tbody>
</table>

*: 1981 data are based on the Third National Census
**: 1992 data are based on the Fourth National Census

Table 2. Per capita consumption – Trends of inequity in China: RMB Yuan (percentage of whole China average)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole China</td>
<td>289 (100)</td>
<td>635 (100)</td>
<td>947 (100)</td>
<td>1148 (100)</td>
</tr>
<tr>
<td>Urban areas</td>
<td>547 (189)</td>
<td>1281 (202)</td>
<td>2032 (215)</td>
<td>2480 (216)</td>
</tr>
<tr>
<td>Rural areas</td>
<td>232 (80)</td>
<td>473 (74)</td>
<td>650 (69)</td>
<td>774 (67)</td>
</tr>
<tr>
<td>Shanghai:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>3050 (322)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guizhou Province:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>421 (44)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: China Statistical Yearbook 1994, current prices

300 poor counties (12% of all China) was undertaken by the Ministry of Health (MoH) in 1989, with technical assistance and financial support by UNICEF and UNFPA. The survey documents a dismal state of maternal and child health in the poor areas. Maternal mortality exceeds 300/100,000 in some poor and remote areas, a level comparable to that of Rwanda. The IMR exceeds 100/1000 in 38 of the 300 counties and the average IMR was 68/1000, comparable to Kenya. At the same time the health indicators of the big cities, like Shanghai and Beijing, are on a level with or better than those of big cities in the US.

Although there could be questions regarding the reliability of earlier health statistics, there is little doubt that China of the 1960s and 1970s had achieved a high level of public health, thanks to successful preventive programmes and an emphasis on primary health care and universal accessibility. The absence of health improvements for the rural population in the last 15 years could partly be explained by improved health statistics, but the disappointing health development is likely to be more related to the combined effects of widening income gaps and the large-scale introduction of market elements in the Chinese health care system.

The income and consumption inequities have widened in the last few years (Table 2). The average rural Chinese had a consumption level which was 80% of the national average in 1983, but in 1993 he/she enjoyed only 67% of the national average. In the same period the average urban Chinese increased his/her consumption from 189% of the national average to 216%. The average per capita consumption in 1992 of urban Shanghai citizens was more than 7 times that of rural residents in Guizhou province.

The per capita expenditure on medicine and medical services in 1993 in urban Guangdong (RMB 103.70) was more than 33 times that of rural Tibet (RMB 3.10). A report, however, from an 8 province survey in China on equity in the utilization of health services concludes that China has achieved a very wide distribution of clinics and other services and that they are widely used by those who identify needs for them. These findings contrast with a number of other reports both in China and outside, which have pointed to a declining accessibility of services in recent years.

China has an impressive network of health services extended over the country. Up to the end of the 1970s most health services were provided free or at a small cost and until recently the income differences were small. Starting from around 1986 Chinese health care underwent a Medical Reform (Yiliao Gaige), the prime feature of which was increased emphasis on cost recovery. The health care system in China has now become extremely dependent on fee-for-service (FFS) revenue, mainly from drug sales. Bonus payments to physicians provide an incentive to raise service revenue as much as possible. Targeted marketing methods, previously unheard of in China, even bribes to treating physicians, are now quite commonplace.

These facts, however, conceal considerable local variations in a system that has become increasingly decentralized. The direction of the recent changes is all the more surprising, given that they have their point of departure in a health care system which was designed with equity as a top priority and where equity was achieved relatively successfully. Cooperative health insurance is seen by the Ministry of Health in China as an important part of the solution to the growing inequities in access to basic health care.
The focus of this paper is on the allocative efficiency of cooperative health insurance, with implications for equity in health care utilization and health outcome. This represents the first phase of a SAREC-funded study of the impact on equity of the changes in health care financing in China since 1986.

Rural health insurance – the Chinese experience
Cooperative health care insurance has a relatively long history in China. In the 1940s cooperative rural health care was organized in the Shan-Gan-Ning border area in China. In 1955 cooperative rural health insurance was set up in Henan province. The Communist Party Central Committee expressed its approval of cooperative health insurance on 2 February 1960. In December 1968 Chairman Mao commended the cooperative health insurance system of Leyuan people’s commune in Changyang county in Hubei province. This created the impetus to start cooperative health insurance systems all over the country.

In 1976 about 90% of all the production brigades (villages) in China were covered by cooperative health insurance. By 1978 cooperative health insurance was stipulated by law and on 15 December 1979 the Ministry of Health, the Ministry of Finance and the Ministry of Agriculture jointly issued regulations governing the cooperative insurance systems.

The cooperative movement grew quickly during the 1970s, but faded even more precipitously in the following years. The development of rural cooperative health insurance coincided with the cultural revolution (1966–1976). This association has left a negative imprint on the population in many areas, who continue to view cooperative insurance as a 'product of the cultural revolution'. Moreover, poor management and frequent misuse by cadres during the early implementation added to the negative image. At present less than 8% of the population are covered by cooperative or collective health insurance.

In the past few years reports of decreasing accessibility of health services have contributed to revived interest and active promotion by the Ministry of Health of rural cooperative health insurance schemes.

Rural health insurance in other developing countries
Voluntary health insurance schemes for the rural populations are now encouraged by the governments of China, Thailand, Vietnam and other countries. It has to be noted, however, that the success stories are few.

In Thailand the voluntary health card scheme has been promoted since 1983, but has only reached a coverage of 5% of the population. There has been reluctance from the population to purchase the card unless a major expenditure is imminent, such as a delivery. As a consequence the scheme is heavily dependent on government subsidies. Another problem is that card holders sometimes find that they get less attention from care providers than if they were paying in cash.

Vietnam launched a voluntary health card scheme in 1993. The coverage remains low, less than 5% of the population, of which more than 90% are compulsory participants. There are many problems reported; high dependence on government subsidies, poor quality of services, doctors asking for bribes and discrimination against card holders.

The low participation in Asian countries could be explained by many factors in addition to the problems reported, e.g. culturally determined risk evaluation.

Burundi has implemented a health card scheme since 1984. In a survey it was found that 23% of households held valid health cards. Women who were interviewed thought that the health card was good for poor families, for families with seasonal income and for women with husbands who drink. However, it was also noted that the quality of services was low, that drugs were frequently out of stock and that card holders received less attention. A 50% higher utilization among card holders was observed. Twenty-seven per cent of the households reported financial inability as the reason for non-participation. The revenues of the card sales cover only one-third of the drug costs.

The Bamako Initiative
The Bamako Initiative refers to a variety of models for community financing of essential drugs for primary health care, an initiative endorsed in 1987 by African leaders. With financial backing and promotion by UNICEF, it has been implemented in different forms and to different extents by a number of countries in Africa and Asia. Although China is not officially participating there are many similarities between the Bamako Initiative and the Chinese system of community financing by means of user fees, mainly for drugs.
A study of the early implementation of the Bamako Initiative in four countries concluded that there is considerable variation between the countries both in the way the Initiative has been implemented and in the country experiences. In most of the countries problems exist with respect to the incentives created by the pricing structure. The failure of the exemption mechanisms to protect vulnerable groups was evident in all countries. The affordability of services was cited as a serious problem in relation to travel and other costs involved in the use of higher level facilities, and to use of NGO-facilities. The evaluation suggested that a clearer picture of the relative affordability of the Bamako Initiative activities is needed. The concerns in respect of the incentives, the exemption mechanisms and the affordability of the Bamako scheme could be equally relevant for the Chinese rural health care system.

User fees and 'quality'
Litvack and Bodart reported in 1993 a pre-post controlled experiment in Cameroon of introducing user fees simultaneously with improved drug supply. Their conclusion was that utilization increased significantly, especially among the poorest quintile, as a result of the intervention. The report has been frequently quoted in World Bank publications as empirical evidence supporting the World Bank policy package. The fact that people will be prepared to pay according to their ability when drugs are available and that they will not bother to visit clinics without drugs, even if no charge is made, is not really surprising. This notwithstanding, the study design has been repeated by others.

These studies are based on only partial cost recovery and tell us little of the long-term viability of such schemes and even less of the impact in terms of the commercialization of services. To increase the utilization of health facilities by providing the drugs that should have been there in the first place is not sufficient to convince that user fee financing is the path to a better health for all.

Health insurance and health care expenditure – a theoretical framework
The World Bank has focused on health care financing in developing countries as one of its central areas of interest since it started to take an active role in the health sector in the 1980s. In 1987 the World Bank published its policy paper ‘Financing Health Services in Developing Countries: An Agenda for Reform’. The Agenda for Reform proposes four policies:

- to charge user fees at government health facilities,
- to promote health insurance,
- to promote the private sector, and
- to decentralize government health services.

This World Bank policy document reflected the market-oriented trends of the 1980s and has had considerable influence. Today the majority of governments in developing countries are involved in health sector reforms implementing part or all of the proposed policies. China, whether influenced by the World Bank or not, has followed the recommendations closely.

The four policies are interrelated in the sense that privatization will require user fees, which will facilitate decentralization. The increased reliance on user fees is likely to create financial difficulties for the poor and for those suffering from catastrophic or chronic diseases, which will prompt health insurance.

The Agenda identified three main problem areas in the health sector, which the policies were targeted to deal with:

- allocation, insufficient spending on cost-effective programmes;
- internal efficiency, poor use of scarce resources; and
- inequity, inequalities in access to care.

According to the Agenda, health insurance would help to improve allocative efficiency and to reduce inequities, in access to care.

The World Bank’s Agenda for Reform linked the successful introduction of user fees in developing countries to widespread popular participation in health insurance schemes. Four main systems were suggested:

- Social insurance, which is related to a government sponsored health insurance, often compulsory for government staff.
- Employer-based schemes, where the employer either maintains his own on-site health facility or contracts with an external facility to provide health care for his employees.
- Prepayment schemes, including, for example, health maintenance organizations (HMOs), systems where the participants have formed or joined a group to regularly pay a fixed amount and
in turn receive care according to the rules of the organization.

• **Private insurance**, which involves voluntary payment of premiums to an insurance company to get the agreed coverage with respect to health care fees.

All four systems can be found in Chinese rural health care financing.

Health insurance can involve both a *savings aspect*, i.e. risk sharing across the time span of an individual's life, and an *equity aspect*, i.e. risk sharing across the population. If the risk sharing is limited to the local community, which is often the case with rural health insurance, the equity implications of the insurance scheme will obviously be more limited. The objective can be to cover smaller expected expenditure as a kind of prepayment or savings system and/or to cover major unexpected expenditure of a more catastrophic nature.

What constitutes a particular challenge in the design of health insurance systems, and especially in rural health insurance, is the fact that health care needs are greater among those with the least ability to pay, while for most other insurance systems the demand for insurance increases with the ability of the insured to pay.

One of the purposes of introducing health insurance is, obviously, to improve access to services for underserved groups. However, improving access may increase costs more than expected. For health insurance to be viable, long-term expenditure must not exceed long-term revenue. Health insurance is sometimes introduced with expenditure projections based on past expenditure patterns. This is likely to be misleading, since large previously unmet needs can be anticipated, particularly among low-income groups.

The concept of *moral hazard* refers to the risk that those individuals who are aware of their poor health and have a high likelihood of medical expenditure will be more prone to enroll in voluntary health insurance, and that those who have enrolled will be less hesitant to use the available services since they only have to pay part of the cost. There is a risk that providers may induce extra demand that will consume the additional resources mobilized by health insurance. It is well established that in the health care sector the providers, e.g. the physicians, have a considerable influence on the demand for health care by the patients, something which is usually referred to as 'supplier-induced demand' (SID).

Public subsidies of health insurance are motivated by the public interest to ensure the entire population's access to basic health services, arising both from the wish to prevent or reduce disease spreading and from altruistic motives to avoid human suffering as far as possible. These characteristics have led most of the European countries to establish tax-financed or compulsory social insurance systems of financing health care.\(^27\)

In China, as in most of the developing countries, tax-financing has not been seen as a feasible short-term solution to health care financing. An efficient tax system requires legal, accounting and auditing systems, and, even more critical, a body of trained professionals to operate the systems.

**Finance and ethics**

Two broad but rival ethical bases on which systems of health care finance can be based appear from the literature. The first considers access to health care as essentially similar in ethical respects to access to other goods. The second ethical basis regards access to health care as a right of citizenship, like the right to vote, which should not in any way depend on individual income or wealth.

This second ethical basis is clearly the predominant viewpoint in most European countries and in Canada. This was the ethical basis of Chinese health care up to 1978, even if at all times there have been difficulties in living up to the high ideals. Article 45 of the Chinese Constitution stipulates: 'Citizens of the People's Republic of China have the right to material assistance from the State and society when they are old, ill or disabled. The State develops social insurance, social relief and medical and health services that are required to enable citizens to enjoy this right.'

**The Medical Reform (Yiliao Gaige) in China**

During the 1980s the Chinese government had to face a shrinking revenue situation. Both central and local government revenue decreased from more than 34% of the GNP in 1978 to less than 20% in 1992.\(^28\) In 1987–88 the provinces had to cut their expenditure on health care by 18%.\(^30\) The central government saw its power slip along with the shrinking tax base. The MoH's already small support for village doctors...
declined by 45% in real terms from 1979 to 1987. At the same time the cost to the government of the 'free' government health insurance (Gongfei) system increased by an average of 30% annually.

In May 1982 the central government allowed some enterprises to try new methods to reduce medical costs. From around 1985 the previous system of financing rural health care by a cooperative medical service (health insurance) was replaced by user fee financing. In March 1988 a reform research group was set up to review the (government) medical insurance system. The group produced a draft titled 'A Plan to Reform the Medical Insurance System'. Four cities were chosen in March 1989 as trial areas.

According to a statement by Dr Chen Minzhang, Minister of Health: 'the way to reform the free medical care system is to change it into a comprehensive social medical insurance system, strengthening gradually people's 'sense of cost' and getting more efficient use of the state's medical funds.' The implication of this statement seems to be that the 'free' government health insurance system (gongfei) will eventually cease to exist and will be replaced by a social health insurance system, with considerable co-payments and/or co-insurance. A key objective appears to be a better control of the rapid cost escalation.

Health care expenditure and provision of services in rural China

The rural health care system in China is organized in a three-tier system in the counties; county hospital, township hospital/health centre and village health station. A survey in 1987–1988 of the financing and provision of MCH services in six counties in China by the Shanghai Medical University and the MCH Project Office of MoH demonstrates that the lower the level of care, the heavier the reliance on fee-for-service and especially drug sales for revenue (Table 3).

In five of the six surveyed counties an average of 71.5% of the total health care revenue was fee-for-service revenue. The county government provided on average 24.8% and province and prefecture (between county and province-level) governments contributed an average of 3.7%. Sales of drugs made up no less than 53.1% of the total health care revenue. Surgery accounted for less than 2% and other clinical fees for less than 7% of total revenues. This reflects the perverse pricing of health services in China, where clinical services are priced below costs, which again are kept low by central salary controls.

In maternal preventive work fee-for-service revenue accounted for an even higher share, 93.0% of total revenue, with drug sales providing 57.5%. Prevention in this context is defined on the basis of administrative structure and includes all services performed through the maternal and child health and the anti-epidemic (immunization) units. In preventive health care for children fee-for-service revenue provided 95.0% of total revenue, of which 56.3% was from drug sales.

The bulk of preventive work in Chinese rural health care is performed at township or village level. At township level (including villages) the county budget provided 14.5% and the township budget another 1.3% of the total revenue. Fee-for-service charges generated the remaining 84.2% of the revenue. Drug sales contributed 60.8% of the total revenue at the township level.

Most of the public budget funding (60.2%) is allocated to the county level (tertiary care) while most curative work takes place in the villages where almost no public budget funds (0.4%) are allocated. Most preventive work is based at the township health centres (64.8%), which receive only 39.4% of the public budget funds (Table 4).

Purpose and hypothesis

In 1993 we initiated a research project focusing on the impact on equity in the financing of and access to health care resulting from the medical reform in...
Table 4. Allocation of public budget expenditure, curative and preventive services in Rudong County, Jiangsu, China, 1988 (percentages)

<table>
<thead>
<tr>
<th>Level of care</th>
<th>Public budget expenditure</th>
<th>Curative services</th>
<th>Preventive services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td>60.2</td>
<td>9.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Secondary</td>
<td>39.4</td>
<td>36.4</td>
<td>64.8</td>
</tr>
<tr>
<td>Primary</td>
<td>0.4</td>
<td>54.5</td>
<td>34.4</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: MCH Services and Expenditure Research 1990 Shanghai Medical University/MCH Project Office of MoH, Beijing

China. For the present paper we have used a controlled natural experimental design to analyze the health expenditure trends in two 'twin' counties in Jiangsu province of China. One of the counties has a health financing system built on health insurance and the other county has a predominantly user fee funded system. The analysis is based on macro-level health care expenditure data. We believe this to be one of the first reports using this study design.

The Rand health insurance experiment was an important (and very costly) randomized experiment which demonstrated in an American setting that co-insurance will reduce total health expenditure. The Rand study also found that 'well-care' services are about as price responsive as other services. Similar experiments have not been reported from other countries and are perhaps unlikely for cost reasons.

The Agenda for Reform postulates that health insurance will improve allocative efficiency and help to reduce inequities in access to care. Our assumption is that different financing systems yield different health care expenditure profiles and will differ in their impact on equity in terms of who bears the cost of and who enjoys access to care. The interrelationship between the financing system and the provision of health services is determined by a complex interaction of the political sphere, third party-payers, providers and patients. Their interaction determines the availability of funds for health services, the allocation of funds for different services, and the equity and efficiency of the system. Exactly how this interaction develops is determined by the general socioeconomic environment, as is suggested by our model (Figure 1).

One of the fundamental problems is to understand exactly which parameters in the financing system are the explanatory variables; the relative mix of user fees, budgets and insurance, the payment modes and levels or the relative price of different services. Few empirical studies have attempted to shed light on this question. Most of the studies so far have been exploring only one explanatory variable, for example the GDP level or the introduction of user fees or health insurance. We are examining cooperative health insurance versus user fees as explanatory variables, with inflation-adjusted per capita health care expenditure, curative expenditure, preventive expenditure and tertiary curative expenditure as the dependent variables. We have recently collected micro-level data in household surveys, provider interviews and patient exit-interviews which will make multivariate analysis possible in the near future.

The provider and patient incentives of the reformed Chinese health care system, with its fee-for-service system, could be expected to result in a high proportion of expenditure on curative medicine relative to preventive medicine and to a shift towards higher level curative care. This is due to the fact that the price level of services is kept below cost except...
for pharmaceuticals and high-tech diagnostics\textsuperscript{36,37} and that providers have financial incentives (bonus income) to increase service revenue, at the same time as insurance-covered patients may demand or be induced to demand excessive services or unnecessary drugs.

Our hypothesis is that a system based on voluntary health insurance will contribute to a higher level of health care expenditure, to an increasing share of curative care expenditure and to an increasing share of tertiary care expenditure.

**Setting and methods**

We have reviewed the health care revenue and expenditure in Jintan county and in Jurong county. Jintan county has developed a comprehensive health insurance system covering the majority (more than 60\%) of its inhabitants, while Jurong has decided to refrain from developing health insurance and has mainly user-fee based financing of health care. Both counties are relatively well-off by Chinese standards. Jintan county has a slightly smaller population of 541,000 (9.1\% less) with an average GNP per capita of RMB 4210 (1993). Jurong has a somewhat larger population of 598,000 and a slightly lower GNP level, RMB 3833 per capita (minus 9.0\%). Both are above the national average GNP per capita in China and around the average of Jiangsu province.

Jintan and Jurong counties were purposely selected as two neighbouring ‘twin’ counties with similar socioeconomic environment, demographic and health status, geographic, cultural and educational conditions as well as political and regulatory environment, but with different health financing systems (Table 5).

We have reviewed health sector accounts data and compared the funding sources, expenditure levels and trends of the two counties. The time period reviewed was 1986 to 1994. This period was chosen as 1986 was approximately the time that emphasis was shifted from cooperative medical services to cost recovery, by means of user fees, in Chinese rural health care. From that time only part of the health care expenditure, indeed only part of the staff salaries, has been paid from public budget contributions.

The GNP and the health expenditure data have been adjusted by the rural general price index, using 1986 as the base year. We did not use the rural medical price index for reasons of comparability with GNP. We were also not so much concerned with determining the volume changes but rather the change in cost to the patients, whether caused by volume or price

### Table 5. Health systems environment of two ‘twin’ counties in China (1994)

<table>
<thead>
<tr>
<th>Financing system</th>
<th>Jintan county</th>
<th>Jurong county</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health insurance coverage</td>
<td>Fee-for-service payments to providers with health insurance refunds of part of the cost for the majority</td>
<td>Fee-for-service payments to providers without insurance refunds for the majority</td>
</tr>
<tr>
<td>Income per capita</td>
<td>&gt;65% of the population</td>
<td>&lt;5% of the population</td>
</tr>
<tr>
<td>Service delivery</td>
<td>RMBY 2522</td>
<td>RMBY 1847</td>
</tr>
<tr>
<td>Socioeconomic characteristics</td>
<td>public ownership</td>
<td>public ownership</td>
</tr>
<tr>
<td>Population</td>
<td>agriculture-based village and township enterprises, 25.3% farmers</td>
<td>agriculture-based village and township enterprises, 47.2% farmers</td>
</tr>
<tr>
<td>Health status</td>
<td>541,000 pop. (1992), 11.8% urban, one-child policy, 5.8% &lt;5 years old, 14.2% &gt;60 years old</td>
<td>598,000 pop. (1992), 15.2% urban, one-child policy, 5.0% &lt;5 years old, 10.4% &gt;60 years old</td>
</tr>
<tr>
<td>Traditions/culture</td>
<td>growing problems with chronic and degenerative diseases, gaining control over epidemic diseases</td>
<td>growing problems with chronic and degenerative diseases, gaining control over epidemic diseases</td>
</tr>
<tr>
<td>Health care regulatory system</td>
<td>Han Chinese population</td>
<td>Han Chinese population</td>
</tr>
<tr>
<td>Geography</td>
<td>central government price controls, central salary system</td>
<td>central government price controls, central salary system</td>
</tr>
<tr>
<td>Educational system</td>
<td>southwest Jiangsu, mainly flat land with some hilly areas</td>
<td>southwest Jiangsu, mainly flat land with some hilly areas</td>
</tr>
<tr>
<td>Political system</td>
<td>&gt;99% school enrolment</td>
<td>&gt;99% school enrolment</td>
</tr>
</tbody>
</table>
level changes. For 1994 we used the general price index, since the rural general price index was not available.

The data sources for this paper are interviews and accounts data extracted from the public health system in the two counties. It is our impression that the quality and detail of public health accounts have greatly improved in recent years. During a visit in October-November 1993 to both Jurong and Jintan counties we interviewed health officials at county, township and village levels. Health facilities and practitioners outside the public system were not included. The private sector, NGOs and other non-MoH operators remain very small in the Chinese health sector, with the exception of hospitals operated by the army of other units, e.g. the Railway Ministry. The village doctors in Jurong county can be viewed as semi-private; they are, nevertheless, included in this study.

Findings and discussion

Jintan county – rural health insurance system

Jintan county has developed, in collaboration with medical universities and encouraged by the MoH, a rural health insurance system, which by some is seen as a possible model for national level implementation. The health insurance system as of the late 1980s was described in an ILO report.38

Several health insurance systems combine to build a relatively comprehensive system. First, there are the national insurance systems: the Government Health Insurance (Gongfei) and the State Enterprise Worker Insurance (Laobao). Gongfei and Laobao mainly cover the urban state-employed population. In Jintan county about 3.7% of the population are covered by either Gongfei or Laobao. Gongfei can be characterized as a social insurance with coverage of government staff and limited coverage for their immediate dependants. Laobao can be classified as an employer-based scheme. Previously, the entitlements were similar under the two systems, which both guaranteed free examination, treatment, hospitalization and drugs, except for a minimal registration fee, board expenses during hospitalization and nutritious medications. Direct dependants receive 50% coverage of expenditure.

The Jintan cooperative health insurance system covers more than 60% of the county population. In 1969 the coverage was more than 75%. Later it decreased until in 1983 the system again started to attract participants. In 1992 there was yet another decrease in participation. The growth of private enterprise has affected participation negatively. It was reported that healthy people generally were less inclined to participate in the system. The Jintan cooperative health insurance is built on an individual contribution of 1.0–1.5% of the per capita income, or RMB 8–10 per year. The villages contribute from their welfare funds and the county contributes from the previous year’s excess service revenue. There is a list of 120 essential drugs which are covered by the system. Fifty per cent of the funds are expended at village health stations (primary care). The participants pay the registration fee (RMB 0.20) only, treatment and drugs are covered. Drug demand is controlled by issuing only one day’s need at a time, except for some chronic diseases. A list defines the ailments covered by the scheme. The system will reimburse outpatient visits by RMB 3–5, inpatient visits at township hospitals up to RMB 50 and county hospital inpatient visits up to RMB 100. Inpatient visits will require referrals. Outpatient visits to higher level facilities are not reimbursed. The ceilings for reimbursement appear modest in view of the cost of, for example, a CT scan (RMB 400), tuberculosis chemotherapy (several hundred RMB) or cancer care (several thousand RMB).

A high-risk insurance system was started in 1989 in Jintan county. The premium is RMB 2–3 per person per year. The insurance is intended to cover hospitalization and will reimburse 40% of charges above RMB 300 up to RMB 1000, 50% of charges above RMB 1000 up to RMB 2000 and 80% above RMB 2000, up to a ceiling of RMB 3000. Treatment charges are refunded, but not drugs and not high-tech diagnostics.

Jurong county – user fee based system

In Jurong county, health officials reported that although the MoH advocated cooperative rural health insurance there was considerable resistance both from the doctors and from the public. The officials did not believe that cooperative insurance was a viable option since the healthy were reluctant to pay the premiums and the doctors preferred more market-oriented solutions and the bonus payments that go with it.

Patients covered by Laobao are often required to seek care at the factory health station or hospitals contracted by the work unit. Gongfei patients are, in
principle, subjected to referral restrictions, but in practice appear to have been freer in their choice of facility, although restricted within the boundaries of their county. Since the medical reform, co-payments (flat-rate contribution) and co-insurance (percentage contribution), and expenditure ceilings, have been introduced according to local rules and applications. Gongfei is administered by the county health bureau, while Laobao is administered by the respective work unit. In Jurong county approximately 1.5% of the total population are covered by Gongfei.

The Jurong Office of Government Health Insurance under the County Health Bureau allots RMB 74 per insuree/year of which RMB 40 is allocated from the government health budget. The work units provide the remaining RMB 34 per insuree. Claims above RMB 40 per person/year will be reimbursed by a certain percentage depending on the patient category. Expenditure above RMB 74 per person/year will be covered up to 70% by the county government and up to 30% by the work unit. The patient has to pay first and reclaim later from the work unit.

The Laobao insurance is controlled by the work unit, which applies its own rules, but in general follows the Gongfei system. Expenditure up to RMB 40 per person/year is free. A co-insurance is applied for amounts above. Since the rules are decided by the work unit the system varies between townships and between work units. In Shishi township in Jurong county only inpatient visits were reimbursed. The reimbursement rates varied from 0-100%.

Prepayment schemes for preventive services
In addition to the insurance systems there are several prepayment systems which are interesting examples of Chinese health finance innovations. There are prepayment schemes for immunizations, child health and for perinatal care. These schemes function mainly as savings systems, but they also include an insurance element. The main purpose, however, is to stimulate demand for preventive services. In Jurong county the immunization prepayment scheme was initiated in 1987. It involves a premium of RMB 40 per child, which will guarantee free treatment should the child fall ill with any of the target diseases, provided that the vaccination schedule has been followed. The immunization coverage is reported to be above 99%.

The immunization prepayment system in Jintan was started in 1985 in Shetou township. The first system broke down financially, however, due to an outbreak of measles in the same year. In 1986 Houyang township restarted the system and in 1987 it was implemented over the whole county. In 1986 the premium was only RMB 5. In 1993 it had risen to RMB 60 per child. Around 95% of the eligible children are enrolled. The funds, of which 20% are for the anti-epidemic station, are managed by the township hospitals. The anti-epidemic station uses the funds for cold chain operation, equipment, insurance and bonus payments.

Jintan has a perinatal prepayment system, where prospective parents pay RMB 37 which entitles them to care from marital advice to post-partum care. More than 80% of the couples elect to participate. Up to 12 antenatal visits and three postnatal visits plus post-partum examination of mother and child 42 days after delivery are covered. Some health instruction and information materials will be provided. The cost of the delivery itself is not included, but the scheme covers insurance of the mother against death from obstetrical problems (the amount in case of death is RMB 2000). The fund is managed by the township hospital. Out of the RMB 37, RMB 8 are for the MCH institute for the insurance component, for the training of doctors and for doctors’ bonuses.

There is also a child health prepayment system in Jintan county. Parents pay RMB 37 from the time of the delivery and will be entitled to free health check-ups four times in the first year of the child’s life, two check-ups from one to three years of age and one check-up from four to seven years of age. The insurance component is RMB 7. The prepayment schemes do not cover the cost of drugs, laboratory tests or treatment charges.

Escalation of health care revenue
The real per capita fee-for-service health care revenue in Jintan county (insurance county) has grown faster than in Jurong county (user fee county) in the period from 1986 to 1994, which is consistent with our hypothesis that health insurance will reduce financial barriers to access to care.

As shown in Figure 2, the deflated GNP per capita has increased moderately in both counties in the period 1986–1994, whereas the growth of the deflated health care fee-for-service revenue (= patients’ direct health care expenditure) per capita has clearly outpaced economic growth in Jintan county (insurance
county) in the study period. When we compared the
development of the two counties we found that the
growth trends of the GNP per capita were similar,
although the level of the deflated GNP per capita has
been slightly higher in Jintan (insurance county).

There was only a small difference of RMB 3.42 (US$ 0.41) per capita in 1986 in the health care fee-for-service
revenue. This difference has six-folded in 1994, in constant (1986) money value. The fee-for-service revenue per capita in 1994 was 87% higher in the health insurance county than in the user fee county. The difference is statistically significant (P<0.02, double-sided Wilcoxon test).

More curative and less preventive services
Examining the composition of the care provision, our
findings are serious.

The World Bank argued in its 1987 policy document
that full-cost fees could not be introduced until health
insurance was widely available and that the revenues
from user fees can be used for vital preventive and
basic curative programmes. What we see from China
is not only that user fees have been implemented on
a large-scale without health insurance being available
to the rural population, but also that the revenues
generated by user fees have gone to curative medicine
and not to preventive medicine (Figure 3). We can
see that in both counties the (tertiary level) deflated
funding of preventive medicine dropped until 1992,
although in the same period the funding of curative
medicine grew rapidly. After 1992 the county govern-
ments increased allocations to preventive care.

A benevolent interpretation of these findings would
be that, indeed, health insurance has contributed to
removing financial barriers to access to care and that
this is reflected in the higher curative care expenditure
in the insurance county. It remains to be investigated
whether the increase in health expenditure has been
for ‘desirable’ care consumption, i.e. for the basic
package of vital preventive and curative services as
promoted by the World Bank, or if it has gone to
clinically unmotivated consumption of vitamins,
multi-antibiotics and CT scans. From our visits to
health facilities in the counties and from interviews
with households and providers we have reason to fear
that the expenditure growth is primarily related to the
latter category. We already know, as noted above,
that real per capita expenditure on preventive
medicine decreased by 55% in the insurance county
from 1986 to 1992. Figure 4 gives an indication of
what type of care expenditure has grown.

Figure 2. Trends of real GNP and health care fee-for-service revenue in Jintan county (insurance) and Jurong county (user fees)

Figure 3. Trends of real tertiary preventive funding in Jintan county (insurance) and Jurong county (user fees)

Figure 4. Trends of real per capita expenditure on obstetrical care and laboratory tests, Jintan county (insurance) (RMB, 1986 money value)
The real per capita (fee-for-service) expenditure on obstetric care in Jintan (insurance county) dropped slightly (14.1% decrease) from 1990 to 1992, while real per capita expenditure on laboratory tests nearly doubled (86.0% increase). Comparable data from earlier and later years, and from Jurong county, were not available.

In Jurong county (user fees) 21.1% of total county-level health care funds were used for preventive services in 1985 against only 6.4% in 1992. In Jintan county (insurance) the share of county-level preventive services dropped from 8.6% in 1986 to 4.0% in 1992.

The total health care funding in Jintan (insurance) in 1992 (except unofficial payments and funding of army and other non-MoH facilities) consumed 2.4% of the GNP of the county. Total health care funding in Jurong (user fees) in 1992 (except funding of army and other non-MoH facilities and except unofficial payments) was 1.4% of the GNP of the county, a drop from 1.6% in 1991.

Expanding tertiary curative care services

The funding of county (tertiary) level curative care was increasingly higher in Jintan (health insurance) relative to Jurong (user fees). The difference increased by 473% in real terms and is statistically significant at $P < 0.02$ (double-sided Wilcoxon test) (Figure 5). The level of tertiary curative care revenue per capita was 286% higher than in Jurong in 1994. The growth of tertiary curative care was very rapid in Jintan (insurance) from 1986 to 1989, when it exceeded that of Jurong by 147%. Apparently this led to some restrictive action in Jintan county, because in 1990 the fee-for-service revenue level was brought down. After 1990, growth of tertiary curative care has again shot up in Jintan.

Government health budget and the growing cost of Gongfei insurance

While the government health budget in Jurong county has been kept at a stable nominal level since 1985, the government health budget of Jintan county has expanded. There could be a number of reasons for this difference, but the considerable above-county level contributions to Jintan, which is not paralleled in Jurong, provides part of the explanation. The stronger political support in Jintan county is probably fuelled by a desire to demonstrate the success of its health care system.

The budget allocation in Jurong county for Gongfei (government) insurance was RMB 1 500 000 (1993) corresponding to RMB 74 per person per year. Actual Gongfei expenditure has, however, exceeded budget allocations consistently and increasingly over the years. In 1992 current value Gongfei expenditure per enrollee in Jurong county was RMB 278, which is extremely high compared to the current value per capita health expenditure of RMB 34. After adjusting for the 50% partial coverage of dependants, the per capita expenditure, RMB 170, exceeds the average per capita expenditure by a multiple of five.

Gongfei expenditure in Jurong has grown proportionally more than the total health expenditure during the years 1988 to 1992. Gongfei expenditure increased by 97.1% compared to 77.2% growth of total per capita health expenditure.

Both in 1992 and in 1993 the Gongfei system faced huge deficits in Jurong. These deficits were eventually covered by the county government. But, since the funds are handled by the individual work units there are differences among them in financial viability. Not infrequently work units will resort to delays in refunding claims, with delays of up to one year reported. Co-insurance may also be raised.

Reported problems, outside the chronic deficits in the system, are cheating by the patients, for example by receiving medicine which is for use by other (non-covered) persons.

Coverage by the national insurance systems is very low in the two counties, less than 5% of the population, yet the systems consume a disproportionate
share of the total available health care resources. In Jurong county 12% of total health care resources were consumed by Gongfei participants who constituted less than 2% of the total population.

**Drug prescriptions**

'Da chu fang' (big prescriptions) is an expression describing the frequent overprescription practices motivated by revenue and bonus considerations. The findings have confirmed a difference in the level of drug sales between the two systems (Figure 6).

![Figure 6. Trends of real pharmaceutical fee-for-service revenue in Jintan county (insurance) and Jurong county (user fees)](image)

The trends of drug sales were similar until 1992, but in 1993 and 1994 growth of per capita drug sales in Jintan (insurance) has been markedly higher. The per capita consumption of drugs was 67% higher in Jintan than in Jurong (user fees) in 1994. For both counties drugs contribute a large share of total service revenue. In Jurong, 47.3% of the total health care funding came from drug sales, while drug sales contributed 38.3% in Jintan in 1994. Salaries are low, while the price level of drugs to some extent is global. The high reliance on drug sales for revenue raises questions about the pricing of health services in China; it also raises ethical questions.

**Summary**

We believe this to be one of the first reported controlled natural experimental studies examining the impact of voluntary health insurance on allocative efficiency. The expenditure data from the two counties confirm the hypothesis that health care expenditure will grow faster in a fee-for-service (FFS) system with voluntary health insurance. Real per capita curative care, tertiary level curative care expenditure and FFS revenue have grown in both counties, while the real per capita expenditure on preventive programmes has remained low, in contrast to the World Bank policy suggestions that revenue raised by user fees can be allocated to basic curative and preventive care.

County (tertiary) level health care consumes most of the public funding in both the counties, but is likely to be used mainly by the higher income urban population and by the small number of civil servants covered by government insurance. Village and township health care (PHC) serves the larger rural population, but receives a small share of the public funds.

Previously reported natural experiments were mostly lacking a control group. They have usually compared demand before and after the introduction of health insurance. The absence of a control group left the results open to the influence of various confounding factors. For example, it is impossible to disentangle the effects of general GNP changes from the impact of financial reform. Clearly, any study which is not a randomized controlled trial will be subjected to the influence of confounding factors, but we believe that our study design has allowed us to reduce such problems to a minimum. We believe that the most important influencing factors, such as changes in GNP per capita levels, educational levels and provider incentives, have been controlled by the study design.

Paretian welfare economics theory postulates that the sum of individuals’ health care demand will add up to the optimal societal utilization of health services. The paradox of health care demand is, however, that what is perfectly rational for the individual is not necessarily rational for the society. This is because health care involves life-death decisions or at least health-ill health decisions. If a patient suffers from a fatal condition where the chance of successful surgery is very small (e.g. liver cancer), it will, nevertheless, be perfectly rational for the patient to invest all the money that he/she can lay his/her hands on, to increase the chance of survival from, say, 1% to 3%. What is there to lose if the alternative is to die? From the society’s point of view, investing in liver cancer surgery is not likely to be
high on the list of cost-effective health interventions, precisely because of the small likelihood of survival. Paradoxically, the smaller the chance of survival and thus ceteris paribus the smaller the cost-effectiveness from societal point of view, the more the individual will be prepared to pay. If not for consideration of the loss to dependants, there would be no upper limit to what the patient would be prepared to pay, even for an infinitely small chance of survival.

This, in combination with the risk of moral hazard in health insurance systems and the risk of supplier-induced demand in fee-for-service systems, may explain why the World Bank policy package of user fees, privatization, decentralization and health insurance leads to an escalation of health care expenditure and a shift from preventive medicine to curative and to tertiary curative care, as witnessed in Jintan county.

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