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Good News, Bad News
Results from a National Representative Panel Survey on China's NCMS

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Abstract

The overall goal of the paper is to understand the progress of the implementation of China's New Cooperative Medical System (NCMS) program. In the paper we seek to assess the strengths and weaknesses of the program and understand its effect on rural residents using a panel of national-representative, household survey data that were collected in 2005 and early 2008. According to our data, we found that there have been substantial improvements to the NCMS in coverage and participation. The service received by rural residents also improved in 2007. While the progress of the NCMS program is clear, there are still weaknesses. Most importantly, the program clearly does not meet its goal of providing insurance against catastrophic illnesses. On average, individuals that required inpatient treatment in 2007 were reimbursed for 15 percent of their expenditures. Although this is higher than in 2004, on average, as the severity of the illness (in terms of expenditures on health care) rose, the rate of coverage fell. The reimbursement rate for illnesses that required expenditures between 5,000 and 10,000 yuan (over 10,000 yuan) was only 11 percent (8 percent). Our analysis shows that the limiting factor is constrained funding.

Keywords: Rural health; Insurance; China

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The most overarching purpose of a national health system is to ensure that the country's population is provided sufficient health services so that the citizens of the country can attain the good health that is required for development (Rivera, Xu and Carrin, 2006). Evidently China believed enough in the importance of health during the pre-reform era since it was thought to have one of the best records of any developing nation in achieving its health system objectives. After the onset of the economic reforms, however, China's priorities—or at least its ability to achieve its health goals—changed. Between the early 1980s and the late 1990s, China's health system deteriorated. During this period the use of medical care in China dropped sharply, especially in poor rural areas (Eggleston et al., 2006; Akin et al., 2005).

One reason for the drop in the quality of health care in rural areas was the collapse of the Cooperative Medical System (CMS). Through the 1970s, more than 90 percent of China's rural residents were covered by the CMS, a health protection system run by the commune. However, the coverage rate of the CMS declined after 1980. Although China's government struggled to re-construct the CMS several times in early and middle reform period, the coverage of the rural population by the CMS was only 9.5 percent in 2003 (MOH, 2004). The rest of the rural population was basically accessing health services on an out-of-pocket, fee-for-service basis.

With the deep concerns about the flagging state of health services in rural China, top officials decided to initiate a new effort to raise the state of rural health care. Beginning in 2003 the government launched its new rural health care initiative called the New Cooperative Medical System (NCMS), which is run at county level and the central and local governments are supposed to bear the major burdens of

funding. The overall goal of the NCMS is to improve the access of rural residents to health services and—above all—help rural residents reduce the risks that accompany catastrophic illnesses (WHO, 2004). According to government statistics, in the past five years the NCMS has expanded dramatically. In fact, the government recently claimed that it has already covered all rural counties ahead of time (MOH, 2008).

When looking at the results of the studies using information from surveys of rural households, the findings have shown the program's past record can best be described as mixed. For example, Chen et al. (2005) interviewed 1080 households in Hubei province between 2003 and 2004 and concluded that the NCMS played an important role in reducing the poverty caused by illnesses. Using a 15924-household survey in 32 counties, the NCMS Pilot assessment group stated that the hospitalization rate increased by 52.7 percent and that after receiving their NCMS reimbursement, the share of inpatient expenditures—measured as a share of net per capita income—dropped by from 89 percent to 65 percent (Assessment Group on the Performance of NCMS Pilots, 2006). While based on a large sample, this study is also suffered from that it is from the earlier stage of NCMS implementation. However, Zhang et al. (2006) found that the reimbursement rate was far lower than what had supposedly been promised in 2004 based on a national representative sample. Using survey data from one county of Jiangxi province, Yuan et al. (2006) found that many respondents reported that they did not seek medical service because it was still too expensive while NCMS increased the rate of hospitalization of rural residents. Given the importance of health in the rural population and the size and expense of the NCMS program, it is somewhat surprising that there are no recent national-level, economic studies that empirically assess the effectiveness of the program over time.

The overall goal of our paper is to understand the progress of the implementation of NCMS, seeking to assess the strengths and weaknesses of the program and to understand its effect on rural residents using two rounds of national-representative household survey data. To meet this goal, we are trying to achieve three specific objectives: a.) to assess whether or not rural residents believe they have a need for health insurance from the prospective of demand side; b.) to describe the progress of NCMS over time, including the coverage, participation and nature of the payments by household; and c.) to describe the effect of NCMS on the alleviation of financial risk associated with illness bore by rural residents and try to understand if there are still shortcomings in the NCMS program.

To meet the objectives, the rest of the paper is organized as follows. The next section describes the data that forms the basis for this paper. The following two sections look at the need for health insurance in rural China and examine the progress the nation has made in creating and extending the NCMS program. The final substantive section examines the strengths of the NCMS program as well as several of the shortcomings. The final section concludes.

Data

The data are from two rounds of household-level surveys led by the Chinese Academy of Sciences. The two surveys focus on time periods which include the the program's second (2004) and fifth (2007) years of implementation. The data provide an opportunity to examine the progress of the NCMS effort and its impact.

The first round of the survey was conducted in April 2005. At first, 5 provinces (Jiangsu, Sichuan, Shaanxi, Jilin and Hebei) were randomly selected from each of China's major agro-ecological zone. And then, counties, townships, and

villages were selected in these provinces following stratified random sampling method. There were 100 rural villages in our sample[1]. Finally, the survey team used village rosters and the survey team's own counts (of households that were living in the village but not on the roster) to choose randomly twenty households with each village. In the first round, 8 of the households participated in a full household survey; while 12 of the households only participated in a focus group. In total, 800 households and 3141 individuals were included in the survey.

The second round survey was conducted in April 2008. The enumeration teams visited the same provinces, counties, townships, villages and households that had been sampled and surveyed in 2005. During the second round, the enumerators re-implemented nearly the same survey instrument (as in 2005). This time, however, the household survey was given to all 20 households per village. In total the household survey covered 2000 households and 7939 individuals.[2]

The household survey form was designed to collect information on a wide number of variables, including information on each individual's participation in the NCMS program, health status and the medical history of each household member during the previous year. In particular, questions were asked about whether or not NCMS was available in the village and, if so, whether or not each household member participated and whether or not the decision was voluntary of not. The respondents also provided information about the reasons why certain individuals did not participate in the program. The questionnaire included a special block that focused on collecting individual health information. In particular, each respondent was asked whether or not he/she got sick during the previous year and how (and if) he/she

[1] 100 villages = 2 village/township * 2 townships/county*5 counties/province*5 province.
[2] If the household selected in 2005 migrated out of the village, the enumeration team selected a replacement household following the same procedure that was used in the selection of the households in 2005. The second round survey included a total of 2020 households. By the end of the survey, 84% of original households surveyed in 2005 were successfully re-surveyed in 2008. In total, we have observations on 681 households for both years.

responded. The survey also documented detailed information on two episodes of illnesses during the year, including information on "the most recent illness" and "the most serious illness." In addition, we carefully documented for each episode, all expenses that the household spent on medical care and the sources of financing).

Finally, one enumerator interviewed officials in the county NCMS office. to gather detailed information on NCMS policy for both 2004 and 2007. In each county, among other pieces of information, we documented the amount of the payment that the NCMS program demanded of the participants in their county; the nature of the matching payments; and the reimbursement rules.

Need for Health Insurance

In China's post-reform rural economy, there is no doubt that many rural households could benefit from a high quality, effective health insurance program, especially in the case of poor villages. According to our data, approximately 75 percent of all sample individuals self-reported being ill at least once during 2004; 25 percent of all individuals self-reported to be chronically ill.[3] In addition, the incidence of being chronically ill varied between villages. While only 19 percent of individuals in our sample self-reported being chronically ill in the richest villages; 29 percent did so in the poorest villages. The patterns changed little between 2004 and 2007. At the same time, the number of people with illnesses that cost more than 5000 yuan (which in the paper we define as *catastrophic*)[4] to treat rose between 2004 and 2007.

Although from the discussion of the nature of illnesses, the data might seem to indicate that individuals in poorer villages suffered from more serious illnesses, they did not necessarily receive more care. In fact, in 2004 of those who were sick and did

[3] We gave respondents leeway in their response about what was counted as "being ill." We instructed all individuals that were survey to tell us to report on all episodes in which they considered themselves "to be ill."
4 It is measured in real term, and Gao et al. (2006) have used this standard in their studies.

not seek medical care, it is 6 times more likely that those in poor areas did not seek medical care due to financial difficulties than in richer villages. Our data also suggest that many individuals that self-reported having a serious illness can not afford to be hospitalized. In our entire sample, of the 316 individuals that self-reported having a serious illness but did not opt to stay in a hospital in 2004. Although non-financial constraints such as unavailability of beds are part of the reason for not seeking inpatient servincee, the most (56 percent) cited financial problems directly. In 2007, a similar pattern was found from the data provided by the 2000 household surveys. Of the 8000 respondents, 4700 reported that they had at least one episode of a "most serious" illness. Around 4000 of these stated that they did not receive inpatient treatment. By far (about 3200) said that they did not seek inpatient treatment because the illness was not actually severe enough. Of the patients that should have received inpatient but did not (701 individuals), 377 of them reported that they did not do so because they could not afford it. Clearly there is a need—at least for a large part of the population—for some kind of assistance to help them afford health care in rural areas.

Even using such simple-to-collect descriptive statistics from a sample survey, the need for a rural health insurance plan is clear. Like people everywhere, those in rural China have a great need for health care services. Most people get sick each year, many seriously. With rising health care expenses, health costs are rising over time (Yip and Hsiao, 2008). Our data show that most individuals in rural China are able to seek treatment. However, there are a considerable number in all areas, but especially poorer areas, that can not afford further treatment although it is needed.

Availability of and Participation in the New Cooperative Medical System

Although our data showed that there was a great need for NCMS in both years of our survey, as of the end of 2004 the program still had not spread very far. Only 24 of the 100 sample villages were covered by NCMS in 2004. Of the 3141 individuals that we surveyed in 2004 during our household survey, only 783 were living in villages that were covered by the NCMS program (henceforth called *covered individuals*). The level of coverage of our sample was higher than the national number (14 percent) at that time (MOH, 2005).

The progress over the past several years in coverage could not have been more successful, and particularly when the program was truly voluntary. In our sample villages by the end of 2007, 100 percent of villages were covered. More than 90 percent of individuals in the covered villages were participating in the program at the end of 2007 and each participant made a single 10 yuan payment in all of the counties outside of Jiangsu. In addition, fully 98 percent of participants reported that the program was voluntary. If our sample villages are truly representative of China, it would mean that there are now more than 700 million covered individuals in the rural population. Hence, the data from our survey support the government reports of nearly universal coverage.

There also is evidence that the design of the NCMS program has improved. If an individual in sample did not participate in the NCMS program, we asked "why." The pre-coded reasons were divided into two major categories—for personal reasons and for reasons that might be interpreted to be associated with the faulty design of the NCMS program (Table 1). In 2004 47 percent of the non-covered individuals stated that problems with the program design was the major reason that they did not participate. Only 18 percent said so in 2007. For example, more than 10 percent of the

individuals in covered villages did not participate in the NCMS program in 2004 because they did not live and work in the village (that is, they were a migrant worker); only one percent of all individuals in our sample said this was the reason for not participating.

Another question in our survey supports the finding that the current NCMS program is running relatively smoothly. In 2004 there were many complaints about the slow processing of reimbursements for NCMS-related expenses. In 2007 87 percent of respondents stated that they were reimbursed within one week. In some township health centers and county hospitals patients did not even need to apply for reimbursement; their final bill was reduced by the amount that they needed to pay by the amount that was covered by the NCMS program.

Effects on the Rural Population

While not all of the increase in the use of medical services between 2004 and 2007 is necessarily due to the NCMS program, there has been an observed rise in the use of health care services between the two waves of the survey. In response to the question, “Did you seek medical services when you got sick last year,” the share of individuals that responded “yes” rose from 90 to 95 percent. The share of those that used inpatient medical services rose from 7 percent in 2004 to 10 percent in 2007.

Rising per capita medical expenditures in real terms also demonstrate that there is at least some propensity to increase expenditures on health care—for both those in poorer villages and richer villages. Outpatients (that is, conditional on seeking outpatient services) in poor areas increased their expenditures by 15 percent, increasing from 572 yuan to 656 yuan. Expenditures by outpatients in richer areas rose from 390 yuan to 565 yuan . Expenditures on inpatient care also rose. Inpatients

in poor villages increased expenditures by 43 percent from 3362 yuan to 4796 yuan. Those in richer villages increased expenditures from 5819 yuan to 7789 yuan.

The rise in direct program payments—especially relative to the premium that individuals are paying—provides more demonstrative evidence that the NCMS program is improving. In 2004 the expected level of reimbursements to individuals was extremely low. After making a premium payout of 10 yuan, the average individual in the sample (averaging over all covered individuals) received 14 yuan in reimbursements while the combined investment into the program from individuals and local and the central government was 35 yuan per individual.

By 2007 the situation had changed dramatically in a number of dimensions. First, the combined investment from individuals and local and the central government rose to 50 yuan. The share of the central government's contribution accounted for most of the rise. In addition, the expected reimbursement rose. While the premium was still 10 yuan (for most participants), the average covered individual received back was 47 yuan. Not only does this mean the return on the 10 yuan was high, it also means that the share of the total investment used for reimbursements also was much high, rising from 40 percent in 2004 (14/35) to 94 percent in 2007 (47/50).

Shortcomings in the NCMS Program

While from casual observation it initially appears as if the reimbursement performance by the NCMS program is performing well, closer scrutiny reveals a number of possible weaknesses, some of them serious. First, the raw reimbursement coverage rate did not rise between 2004 and 2007. In 2004 22 percent of covered participants who sought medical attention were reimbursed for at least some share of their expenditures. In 2007, only 21 percent of covered patients were reimbursed.

The fall in the share of those who were reimbursed might have occurred if the NCMS program had shifted its emphasis from reimbursing those that who incurred relatively small medical expenses to those who incurred large medical expenses. The data, however, do not support this explanation. In fact, in 2007, of those that received reimbursement, a large share of them (36 percent) incurred expenses less than 200 yuan. An even larger share (41 percent) of all of those that received reimbursements incurred expenses between 200 and 2000 yuan. In other words, 77 percent of those that received reimbursements incurred medical expenses under 2000 yuan.

The tendency to favor reimbursements to those that incurred lower levels of expenditures is born out by data that look at the contribution of NCMS reimbursements to total health expenditures. Although overall the reimbursement rate in 2007 for both inpatients (15 percent) and outpatients (4 percent) was higher than that in 2004 (for both inpatients—7 percent—and outpatients—3 percent), the current NCMS program appears to not achieving its objective to help rural residents deal with catastrophic illnesses. As seen in Column 3 of Table 2, as one goes from expenditure categories (for inpatient care) from expenditures of 200 yuan to 2,000 yuan; 2,000 yuan to 5,000 yuan; 5,000 yuan to 10,000 yuan; and 10,000 yuan and above, the reimbursement rate falls. Notably, for those that suffered relatively catastrophic illnesses the reimbursements rate was between 11 percent (for illnesses between 5,000 yuan and 10,000 yuan) and only 8 percent (for illnesses above 10,000 yuan).

It is not that rural residents are not willing to receive the levels of reimbursement that are being offered, but, it is clear when asking respondents who participated in NCMS for the sources of funds for covering catastrophic illnesses that the NCMS program is only playing a minor role. For example, in the case of inpatient care for catastrophic illnesses, the NCMS program only contributes 9.8 percent. To

finance the rest of their medical expenses, rural households draw on their own savings for 57 percent. They borrow from friends and relatives for 17 percent. They even sell off assets for financing 1.4 percent of the expenditures on catastrophic inpatient expenditures. So, although any little bit helps, the reimbursements from the NCMS program are no where near a level that they can be said to be providing true insurance against the risks of catastrophic insurance.

According to our data, the problem clearly appears to be that rural residents are not being reimbursed at the levels being promised by the NCMS program rules. In each of the counties, our enumerators collected information on the level at which different illnesses should be reimbursed. In Column 5 and 6 of Table 2, we reported the official reimbursement rate against the actual reimbursement rate. Clearly, the patients are not receiving what the program is promising. Moreover, the gap widens as the severity of the illness (in expenditure terms) rises.

Further analysis illustrates that the main problem is one of not having sufficient funding. To show this, we begin our analysis by summing the contributions from the 7175 individuals (participants), 25 local governments (usually county governments) and the central government. In total the localities for this sample of individuals would have at its disposal a revenue pool of 358,750 yuan for insuring all illnesses of the covered individuals who used inpatient services during 2007. As shown in Table 3, however, 358,750 yuan falls far short of being able to cover all of the obligations (promises) of the program. If instead of the using the funds the way that they were used (columns 2 and 3), all of the funds were used to reimburse inpatients with catastrophic illnesses for 22 percent of their expenditures, all of the funds would be used up (columns 4 and 5). If the illnesses in all of the categories were reimbursed at the same rate, columns 6 and 7 show that there were only enough funds

to reimburse 16 percent of inpatient care. Finally, if all of the funds were used for extraordinarily severe illness (greater than 10,000 yuan), in total all of the funds could only cover 31 percent of the output of the residents.[5] Clearly, from all of these simple illustrations, the program is severely underfunded—even for the level of promises made by the program currently.

Conclusions

In this study, we use a nationally representative panel survey of 2000 households in 2004 and 2007 to investigate the newly launched NCMS from the perspective of rural residents. From our data, we can conclude that there continues to be a strong demand for medical coverage in rural areas, especially in low income regions.

In terms of developing a new program that can provide a foundation to address the need for a rural health system, China's NCMS program has made tremendous progress. The coverage of villages has reached 100 percent. Nearly 90 percent of rural individuals are covered by the NCMS. It is voluntary. The program design is improving. Based on our data and on our interviews, there is no other way to put it: NCMS is a popular program in China's countryside.

However, China's NCMS program still has a long way to go if it is to meet its own goal to help rural residents minimize the risks associated with contracting catastrophic illnesses. The program reimburses rural residents for only a small share—less than 15 percent of their total health costs. More troubling the reimbursement rate falls are the severity of the illness (in expenditure terms) rises.

[5] Note that in these simple exercises/simulations, we are assuming that when more of the total expenditure rate is being covered by the NCMS program (which can be construed as the true price of seeking medical care falls), there is no response by the sample individuals to seek more health care. However, it is well known that the demand for health care is price elastic and so this response would mean that the program is even more underfunded.

We have shown in a simple quantitative accounting exercise that the fundamental problem is that the program is underfunded. There are just not simply enough funds in the system to meet the promises of the program. In fact, even if the funding of the NCMS program increased to 100 yuan per individual the program could not even meet the promised level of reimbursement (45 percent or so) for those catastrophic illness when considering the price elasticity of health care expenditures. And if so, there would be no funding left to reimburse any inpatient with an illness less than 5,000 and outpatient.

Although the current program is very popular with a high expected return, when we asked respondents if they could choose between two options—one, a system similar to the current NCMS program; or, two, a program that was effective at insuring farmers for catastrophic illnesses—almost all households chose the second option. Clearly, rural residents seem to prefer a program that would eliminate at least part of the risk of having someone in the household contract a catastrophic illness.

If China is to develop a more comprehensive health system, the current NCMS program will have to evolve a long ways. Certainly part of the problem appears to be that the county is the unit of governmental jurisdiction which is ultimately responsible for covering the liabilities of rural health insurance. The fundamental concepts of insurance provision would suggest that there are many flaws with the current approach. First, most county governments are themselves in chronic fiscal deficit. Therefore, most counties will only be able to cover reimbursements that are equal to or less than the amount of their revenue pool. This is part of the reason that their levels of payout are so low. Counties simply do not have the funds to meet the promises of the program. Even in counties with some level of fiscal surplus, it is difficult to understand how any county should be thought to have the technical and

financial capabilities of running a complicated health insurance program. In simplest terms, more flexible programs are needed if the rural NCMS program is to meet its needs and it is difficult to see how the current funding arrangements will ever be able to meet the needs efficiently and comprehensively.

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Table 1. Reasons Reported by Sample Individuals for Not Participating in NCMS in Rural China, 2004 and 2007.

	2004		2007	
Stated Reasons	Of Total Non-Participating Individuals, Number in Each Category	Share of Total (Each Row/Row1)	Of Total Non-Participating Individuals, Number in Each Category	Share of Total (Each Row/Row1)
Total Non-Participating Individuals[a]	**160**	**100.0**	**738**	**100.0**
Personal Reasons	**73**	**45.6**	**511**	**68.7**
Already Covered by Alternative Insurance	27	16.9	109	14.8
No *hukou* in Village	18	11.2	255	34.0
Do Not Expect Family Members to Get Sick	14	8.8	76	10.3
Infant or Newly Married	3	1.9	43	5.8
Cannot Afford the NCMS Premium	11	6.9	28	3.8
Problem with Program Design	**75**	**46.9**	**135**	**18.3**
Working Outside of Village as Migrant or Self-Employed	39	24.4	87	11.8
Reimbursement Rate Too low	10	6.3	10	1.4
Reimbursement Procedure Too Complicated	9	5.6	17	2.3
Believe NCMS Fund Management Was Not Accountable	9	5.6	21	2.8
Price of Covered Services and Medicines Too High	8	5.0	0	0.0
Other Reasons[b]	**12**	**7.5**	**96**	**13.0**

Data source: Authors' surveys.

[a] "Total Non-Participating Individuals" is number of individuals in NCMS-covered villages reporting that they choose to "not participate."
[b] The Category of "Other Reasons" includes three relatively common answers that do not fit into the "Personal Reasons" or the "Problem with Program Design" categories, including: a.) Individual is so sick he/she is not willing to participate; b.) One of the members of the family is a doctor; c.) Individual is too busy and missed the enrollment date; and e.) etc.

Table 2. Reimbursement Rates in Sample Households in Rural China, 2007

	Inpatients who participated in NCMS		Inpatients who participated in NCMS (conditional on the inpatient sought medical service once and hospitalization and didn't refer)		
	Number of Obs	Actual Reimbursement rate	Number of Obs	Actual Reimbursement rate	Promised Reimbursement rate
0.1-200	11	9.0	3	26.6	42.6
200-2000	150	19.2	45	24.9	41.0
2000-5000	137	15.2	52	18. 8	42.6
5000-10000	71	11.3	14	9.8	45.7
>=10000	49	7.5	13	6.9	41.9
Total/Mean	418	14.9	127	18.9	42.3

Data source: Authors' Survey

Table 3. Scenario Analysis under the Constraint of Total Reimbursed Amount in Sample Villages, 2007.[a]

Medical expenditure	Mean	Frequency	Scenario 1		Scenario 2		Scenario 3	
			Reimbursement rate (%)	Reimbursement (Yuan)	Reimbursement rate (%)	Reimbursement (Yuan)	Reimbursement rate (%)	Reimbursement (Yuan)
0.1-200	129	11			16	227		
200-2000	1173	150			16	28152		
2000-5000	3323	137			16	72840		
5000-10000	6671	71	22	104201	16	75783		
10000-50000	19940	45	22	197406	16	143568	31	278163
>=50000	67475	4	22	59378	16	43184	31	83669
Total		418		360985		363754		361832
Deficit				**2235**		**5004**		**3082**

Data source: Authors' surveys.

[a] On the basis of information from each county's NCMS office, we were able to calculate the total amount of funding provided for the NCMS program in each county including the contributions from rural residents, local government and the central government. The total amount in 2007 equaled 358,750 RMB.

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