Caring for one billion: assessing the new social protection programmes in rural China

Linxiu Zhang
Hongmei Yi
Renfu Luo
Chengfang Liu
Yaojiang Shi
Scott Rozelle
Kim Babiarz Singer
Grant Miller
Scott Atlas

CSP Research Report 07
January 2011
This Research Report was written by Linxiu Zhang, Hongmei Yi, Renfu Luo, Chengfang Liu (Center for Chinese Agricultural Policy, Chinese Academy of Sciences, Beijing, China), Yaojiang Shi (Northwest University, Xi’an, China), Scott Rozelle, Grant Miller, Scott Atlas (Stanford University, USA) and Kim Babiarz Singerd (University of California, Davis, USA).

Please see the two-page Research Report Summary for a quick overview, available on the CSP website www.ids.ac.uk/go/centreforsocialprotection

Acknowledgements
This CSP Research Report series presents findings from 11 research projects conducted over the last two years, 2008–2010, for the Social Protection in Asia (SPA) policy-research and network-building programme, funded by the Ford Foundation and the International Development Research Centre (IDRC). The programme was managed by the Centre for Social Protection (CSP) at the Institute of Development Studies (IDS), Sussex, UK, and the Institute for Human Development (IHD), New Delhi, India, with projects and partners in China, Vietnam, Indonesia, India, Pakistan and Bangladesh.

For further details of SPA programme research findings and policy lessons, see the programme synthesis report 2010, available online here: www.ids.ac.uk/go/idspublication/socialprotection-in-asia-research-findings-and-policy-lessons

For more information about the SPA programme and links to other SPA research outputs please visit www.socialprotectionasia.org
or email info@socialprotectionasia.org

Programme administrative coordinator: Marion Clarke
Publications coordinator: Peroline Ainsworth
Report copy editor: Dee Scholey
About CSP

The Centre for Social Protection was established in 2006, to provide a global focus for research, policy analysis, and capacity building in social protection. Based at IDS, the Centre supports interaction between networks of equal partners, including researchers and policy-makers who work to mainstream social protection in development policy, and to build effective social protection systems throughout the world that are national, comprehensive, sustainable and equitable, and that improve the wellbeing of poor and vulnerable people.

*CSP – Influencing social protection debates and strengthening capacities to deliver sustainable policies and systems, that protect lives and livelihoods while promoting wellbeing and social justice.*

Contact

Centre for Social Protection

Institute of Development Studies

At the University of Sussex

Brighton BN1 9RE

UK

Email: socialprotection@ids.ac.uk

Website: www.ids.ac.uk/go/centreforsocialprotection

Research Report submission

CSP Research Reports are produced by individuals and organisations working with the CSP. For enquires concerning the submission of Research Reports please contact us by email or by writing to the above address.

The opinions expressed are those of the authors and do not necessarily reflect the views of any of the institutions involved

Readers are encouraged to quote or reproduce material from CSP Research Reports in their own publications. In return, the Centre for Social Protection requests due acknowledgement and a copy of the publication.

© Centre for Social Protection and IDS 2011
Abstract

The overall goal of this report is to understand the progress in implementing the New Cooperative Medical Scheme (NCMS) in China, while seeking to assess the strengths and weaknesses of the programme and, in particular, to understand its effects on the incidence of catastrophic medical payment for farmers and on the operation and use of village health clinics. The study is based on two rounds of nationally representative household survey data and village clinic survey data collected in 2005 and 2008. The study found that the programme has a very high level of participation, and has increased farmers’ use of medical services. However, despite efforts by both central and local governments and high household participation, the programme is only partially achieving its policy objectives. In particular, it has been able to extend to almost all of the rural population, but has failed to cover expenses for catastrophic illness, due to insufficient funds. At the village clinic level, it was found that NCMS has increased patient numbers and gross income, but not net revenue. This is partly because clinics have had to take on uncompensated responsibilities.

Keywords
Rural China; NCMS; Village clinics
1 Background and motivation

With rapid economic growth, the Chinese population has experienced a dramatic improvement in living standards in the past 30 years. The annual per capita disposable income of urban households increased from 343 RMB in 1978 to 15,781 RMB in 2008, and the annual per capita net income of rural households increased from 134 RMB to 4,761 RMB (NBSC 1998 and 2009). Moreover, by the World Bank $1 per day poverty standard, the absolute number of poor people fell from 652 million in 1981 to 135 million in 2004, and the fraction of the population with consumption levels below this poverty line fell from 65 per cent to 10 per cent (World Bank 2009).

However, not everyone has benefited from economic growth. As of 2009, 35.97 million of the rural population still lived below the China official poverty line of about $0.43 per day (State Council Information Office 2010). Many of the remaining poor are the elderly, the sick and the disabled; due to lack of human capital, these groups have been unable to benefit from economic growth and the government’s traditional area-based poverty reduction strategies (Zhang et al. 2007). Furthermore, even amongst the non-poor, some are vulnerable to poverty because they lack the capacity or resources to cope with various kinds of risks. Between 2001 and 2004, nearly one third of China’s rural population was below the $0.29 a day poverty line (888 yuan per year) at least once (World Bank 2009).

The central concern of social policies includes both raising the living standards of those who lag behind, and protecting part of the population from deprivation in the event of livelihood shocks. Social protection in general aims to protect individuals and families from contingencies associated, for example, with ill-health, old age and unemployment, which threaten basic living standards. This is usually achieved through a range of public institutions, norms and programmes (International Labour Organization 2005). However, over recent decades, approaches to social protection have placed greater emphasis on reliance on market mechanisms for reducing or mitigating risk, and for access to services such as healthcare, often with disqualising and detrimental effects on the poor.

In China, decollectivisation led to two decades of relative neglect of welfare measures for the rural population, during which period many social services were effectively privatised. Following the expansion of social protection to the urban population, in recent years the government has recognised that providing more protection to the rural poor and vulnerable are essential to further economic development and the maintenance of social stability. Moreover, the construction of rural social protection is an important measure taken by the Chinese government to reduce urban-rural inequality and realise the equalisation of public services. The Report to the 17th National Congress of the CPC on Oct 15 2007 emphasised that social security is an important guarantee of social stability and committed the Chinese government to building a sound social security system that is based on social insurance, assistance and welfare, with a basic old-age pension, basic medical care and subsistence allowances as its backbone, and supplemented by charity and commercial insurance. In the first decade of this century, a number of major new initiatives have been taken in this direction: a New Cooperative Medical Scheme (NCMS), Medical Financial Aid programme (MFA), Minimum Living Standard Protection and New Rural Old-Age Insurance have been set up in rural areas.

The rapid expansion of such programmes has made it hard for researchers and policy analysts to keep up with the pace of their development. A number of questions thus remain insufficiency addressed. These include how effectively the programmes are being implemented; their expansion and coverage; the extent to which they address needs or problems (such as high medical costs); the impact of the programmes both in terms of the socioeconomic status, welfare or behaviour of recipients, and in terms of the system of provision; and the financing and resource constraints.

To address some of these questions, this paper will take the NCMS as a window through which to understand the expansion, strengths and shortcomings of social protection in rural China. It aims to evaluate the impact on the rural population and on primary health providers. Specific questions to be addressed include: how extensive is coverage and how well implemented is NCMS? Does NCMS help rural individuals and families to address their medical needs and cope with high medical costs? How do such programmes impact on rural residents’ healthcare behaviour? What are the socioeconomic impacts of the programme on the household? What is the impact on rural healthcare providers? How are resources mobilised and what are the factors enabling or constraining resource mobilisation? An assessment on the effectivenes and impact of such a massive national health programme is essential, both to ensure effective implementation and desired outcomes; and more generally to contribute to an
understanding of the rapidly unfolding reforms of social protection in rural China.

In order to meet these objectives, the paper is organised as follows: Section 2 introduces the methodology of the study; Section 3 describes the introduction and implementation of NCMS in rural China; Section 4 evaluates the impact of NCMS on rural residents; Section 5 identifies the impact of NCMS on rural primary healthcare providers; and Section 6 concludes.

In addition to contributing to academic research, this study provides Chinese policymakers with convincing, data-based evidence of problems in the design and implementation of the NCMS, and their potential solutions. It identifies a number of actions which are both affordable and doable in China today.
2 Methodology

The data used in this research have been collected after two rounds of surveys led by the Center for Chinese Agriculture Policy at the Chinese Academy of Sciences in Beijing, in collaboration with Stanford University and MIT, USA. There were three modules in the survey to collect information on NCMS: household, village clinic, and county office of NCMS. The two surveys were conducted, respectively, in 2005 and 2008 in five provinces and focused on a time period extending from the first full year after implementation (to the end of 2004) and the fourth full year after implementation (to the end of 2007) of NCMS. Being a true panel (that is, we made repeat visits to the same households and village clinics in the same villages in both time periods), the data provide an opportunity to examine the progress of NCMS and impact over time. Given the timing of the most recent data collection effort, few other studies provide such recent information, especially both from the point of view of the household and healthcare providers at the same time.

2.1 Sampling

The first round of the survey was conducted in April 2005 by using a randomly selected, nationally representative sample of 100 rural villages in five provinces (Jiangsu, Sichuan, Shaanxi, Jilin and Hebei). The sample provinces were randomly selected from each of China’s major agro-ecological zones. Five sample counties were then selected from each province through a two-step procedure. As the first step, the enumeration team listed all counties in each province in descending order of the per capita gross value of industrial output (GVIO). The GVIO was used on the basis of the conclusions arrived at by Rozelle (1996) that GVIO is a good predictor of the standard of living and development potential and is often more reliable than the net rural per capita income statistics. As the second step, the five sample counties were selected randomly from each list. After the county selection was completed, the team then chose the sample townships and villages by following the same procedure that was used in the selection of the counties. In principle, two townships were selected in each county and then two villages were selected in each township. Finally, the survey team used village rosters and the survey team’s own counts (of households that were living in the village but that were not on the roster) to randomly choose twenty households within each village. In the first round, eight of the households participated in a full household survey, while 12 of the households participated only in a focus group.

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 (including the original eight survey households and the 12 households that were part of the focus group in 2005). The household survey thus covered a total of 2000 households and 7,939 individuals.

2.2 Survey instruments

Our survey instruments were applied to three levels: household, village, and county. Of which, the household survey form was designed to collect information on a wide number of variables. At first, the household survey form collected information on each individual’s health status and the medical history, medical expenditure and its sources 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 in it (and whether the decision to do so was voluntary or not). The respondents also provided information about the reasons as to why certain individuals did not participate in the programme. The questionnaire included a special block that focused on collecting individual health information. In particular, each respondent was asked whether or not he/she had fallen sick during the previous year and how (and if) he/she responded (by seeking outpatient, inpatient or no medical care). 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 also recorded detailed information on household demographics and assets through the household survey.

At the same time, the enumeration team sent one of its members to interview local health providers – doctors in the village clinics. During the interview, information on health service utilisation, finances and operations are collected. Specific variables include patient flow, annual income and share of income attributable to drug sales.
They also provided information about NCMS participation and programme rules, including whether or not patient expenditures were reimbursable.

In each county, among other pieces of information, the following details were also documented by the visiting county NCMS office: the amount of the payment that the NCMS programme demanded of the participants in their county; the nature of the matching payments (the share contributed by the local/regional governments and the central government); the reimbursement rules, such as the size of the deductible amount, the reimbursement rates and ceiling regulations.
3 Introduction and implementation of NCMS

3.1 Introduction of NCMS
The breakdown of the healthcare system throughout China since the economic reforms has been a concerning aspect accompanying the economic reform process. In the socialist era, officials put great emphasis on providing basic medical care in rural areas and created a cooperative medical system (CMS) that provided most rural residents with free basic healthcare services. In the late 1970s the coverage rate of the CMS was greater than 90 per cent of the rural population. With the advent of the household responsibility system, however, there was a widespread collapse of the rural healthcare network and the CMS. Rural health services were gradually privatised in an ad hoc way. The central government reduced its commitment to the provision of healthcare, leaving responsibility to sub-national governments. With limited help from central government and their own tight budget constraints, many local governments, especially those in poor regions cut spending on social services, including healthcare, making individuals share more, if not all, of their healthcare costs.

Consequently, a considerable number of China’s rural residents are not able to afford even basic healthcare, and the utilisation of basic health services by farmers has actually fallen because of the rise in the costs of healthcare and the inability of some households to pay for such costs. A nationwide health service survey undertaken in 2003 reveals that 38 per cent of those who were sick did not seek care because they were unable to pay the high healthcare bills. Seventy per cent of patients that should have received inpatient care in a hospital did not opt for it because of the financial difficulties of paying the hospital bill. According to a number of community surveys, catastrophic illnesses are the number one reason that households fall into poverty.

Recognising the serious problems that are plaguing the rural health system, China’s government took a bold step and initiated a new social insurance programme in 2003, the New Cooperative Medical Scheme (NCMS). The overall goal of NCMS is to improve the access of rural residents to health services and – above all – help them to cushion the risks that accompany catastrophic illnesses. The NCMS differs from the CMS in being run at the county level, with the central and local governments in theory bearing the major funding burden, and voluntary-basis participation. Just as promised by the government, by the end of 2009, the NCMS have been extended to more than 95 per cent of rural counties in rural China.

3.2 Progress of NCMS implementation

3.2.1 Rapid expansion of coverage
By some criteria, the extension of NCMS over the past several years could not have been faster. Although the piloting started in a few counties in 2003, by the end of 2004, 24 of the 100 sample villages were covered. Of the 3,141 individuals surveyed in that year, only 783 (or 24 per cent) were living in villages covered by the programme (henceforth ‘covered individuals’). By the end of 2007, all the surveyed villages had been covered. In addition, more than 90 per cent of the individuals in the participating villages were covered by the programme. If the sample villages are nationally representative, this would mean that at least 90 per cent of the rural population is now participating in the NCMS programme. When compared to the situation in the early 2000s, when less than 10 per cent of the population was covered by a national health insurance programme, the progress, by any standard, has been rapid and comprehensive.

3.2.2 High voluntary participation
Survey data from both rounds demonstrate that the programme was implemented on a voluntary basis and has a high participation rate. In 2007, 90 per cent of covered individuals were part of NCMS, 98 per cent of them on a voluntary basis. At the same time, our study also shows that farmers in bad health are more likely to participate in NCMS than those in good health. That is to say, adverse selection exists although a high participation rate is achieved.

The high participation on a voluntary basis is a remarkable success, possibly due to improved programme design. In our survey, we asked individuals who did not participate in the programme their reasons for not participating. The pre-coded reasons were divided into two major categories – for personal reasons (including, ‘I am already covered by other insurance’; ‘My household registration [hukou] is not in this village’; ‘I do not expect to get sick in the coming year’) and for reasons that might be interpreted to be associated with the faulty design of the NCMS programme (including, ‘I am working at another place and cannot be covered’; ‘It is inconvenient’; ‘The reimbursement rate is too low’; ‘The reimbursement procedure is too complicated’). In 2004, nearly half (47 per cent) of the non-covered individuals stated that problems with programme design were the major reason why they did not participate. However, only 18 per cent said this in 2007.

1 In the household survey form, we asked the question ‘Did you participate in the New Cooperative Medical Scheme on a voluntary basis?’ To collect information on this.
The existence of family accounts might also contribute to this high level of voluntary participation. The fund of family account is a part of the premium paid by participants within a family and can be directly used to pay outpatient services by participants and his/her families. In our sample, 64 per cent of counties set up family accounts and promised that the surplus could be automatically rolled over to the next year. To some extent, the family account acted as a savings bank account for medical expenses for farmers who thus would not lose much even if they did not get any reimbursement from NCMS, especially when the money annually paid into the family accounts was close to the ceiling of the premium paid by the participant.

The popularity of NCMS also benefited from the ‘model effect’ of reimbursement and aggressive publicity. At first farmers worried that the government would not reimburse them as promised. In fact, the data show that in 86 per cent of villages, farmers who suffered catastrophic illness were reimbursed by NCMS smoothly in 2004, and in 2007 this figure was 93 per cent. The cases where participants were successfully reimbursed by NCMS were usually publicised widely by newspapers, radio and television. The household data also showed that in 2007, 60 per cent of households received brochures from the NCMS administration.

3.2.3 Revenue collection and reimbursement policy

Per capita funding in NCMS increased from 30 yuan in 2004 to 50 yuan in 2007. Of which, although per capita funding supported by both central government and local governments increased from 20 yuan in 2004 to 40 yuan in 2007, the premium paid by NCMS participants was 10 yuan in all the surveyed areas except Jiangsu.2

There are four typical models of NCMS reimbursement package: inpatient expenses only (16 per cent); inpatient expenses and family accounts for outpatient expenses (36 per cent); inpatient expenses and catastrophic (chronic) outpatient expenses (20 per cent), and inpatient expenses and family accounts for outpatient expenses and catastrophic (chronic) outpatient expenses (28 per cent). As found by earlier studies (Wang et al. 2008; Brown et al. 2009; Wagstaff et al. 2009a), one of the outstanding features of NCMS was that inpatient reimbursement was consistently regarded by all NCMS administrative offices as the best means of providing financial protection to the insured. NCMS was also characteristic of the fact that patients were encouraged to seek medical services at lower-level health facilities. As shown in Table 1, the deductible for inpatient services at township health centres were much lower than county provincial hospitals while the nominal reimbursement rates were higher for the same medical expenditure. In addition, the nominal reimbursement rate was supposed to rise with the level of medical expenditure at the same level health facility.

Table 1

<table>
<thead>
<tr>
<th>Medical Expenditure</th>
<th>Township Health Centre</th>
<th>County Hospital</th>
<th>Provincial Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Deductible (Yuan)</td>
<td>53</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>0.1–200</td>
<td>48%</td>
<td>0%</td>
<td>70%</td>
</tr>
<tr>
<td>200–2,000</td>
<td>54%</td>
<td>30%</td>
<td>70%</td>
</tr>
<tr>
<td>2,000–4,000</td>
<td>56%</td>
<td>35%</td>
<td>70%</td>
</tr>
<tr>
<td>4,000–10,000</td>
<td>59%</td>
<td>35%</td>
<td>75%</td>
</tr>
<tr>
<td>&gt;=10,000</td>
<td>60%</td>
<td>45%</td>
<td>75%</td>
</tr>
<tr>
<td>Ceiling (Yuan/participant )</td>
<td>24,500</td>
<td>10,000</td>
<td>80,000</td>
</tr>
</tbody>
</table>

Source: Authors’ data collected from records of county NCMS offices.

1 Jiangsu is the richest province in our sample. The funding supported by local governments and the premium paid by farmers both in 2004 and 2007 were relatively higher than other provinces.
4 Effects of NCMS on rural residents

4.1 Key achievements of NCMS

4.1.1 Increased use of medical services

While not all the increase in the use of medical services between 2004 and 2007 was necessarily due to the NCMS programme, there has been an observed rise in the use of healthcare services during the period between the two phases of the survey. The share of individuals who sought medical care when they became sick rose from 90 to 95 per cent. The share of those who used inpatient medical services rose from 7 per cent in 2004 to 10 per cent in 2007.

The rise in per capita medical expenditures before reimbursement in real terms also demonstrates that there is at least some propensity to increase expenditures on healthcare, for residents of both the poorest and the richest villages. Outpatients (that is, those who sought outpatient services) in the poorest areas increased their expenditure by 15 per cent, from 572 to 656 yuan. Expenditures by outpatients in the richest areas rose from 390 to 565 yuan. Expenditures on inpatient care also rose. Inpatients in the poorest villages increased their healthcare expenditures by 43 per cent from 3,362 to 4,796 yuan, while people in the richest villages increased their expenditures from 5,819 to 7,789 yuan.

4.1.2 Increased expected returns to premium

The rise in direct programme payout, especially relative to the premium that individuals are paying, provides more evidence that the NCMS programme is improving. In 2004, the expected level of reimbursements to individuals was extremely low. After making a premium payout of 10 yuan, the average covered individual in the sample received 14 yuan in reimbursements. The actual payout rate is far lower than the 35 yuan per individual which is jointly invested by individuals and the local and central governments. By 2007, the situation had changed dramatically. While the premium was still 10 yuan (for most participants), the average received back by covered individuals was 47 yuan. This means that not only was the return on the 10 yuan high (a fact that almost certainly accounts for the popularity of the NCMS programme in rural areas and its high rate of participation), but also that the share of the total investment used for reimbursements was also increasing, from 40 per cent in 2004 (14/35) to 94 per cent in 2007 (47/50).

4.1.3 Improved equality of medical expenditure

Using information on demographic and household assets, we constructed a destitution index to measure poverty. Where the destitution index is smaller, the household is poorer. Based on a destitution index, we ranked all households that are eligible to reimbursement from NCMS. The concentration curve plotted shares of reimbursement received from NCMS against quantiles of the destitution index in 2007 (Green line, Figure 1). The further the curve is above the line of equality (Grey line, Figure 1), the more concentrated the NCMS reimbursement is among the poor. Furthermore, the concentration curve of medical expenditure before reimbursement (Black Line, Figure 1) statistically dominated after reimbursement (Red line, Figure 1) at 5 per cent significance level. That is to say, the equality of medical expenditure was improved after reimbursement.

4.1.4 Improved reimbursement services

Another question in the survey supports the finding that the current NCMS programme is running relatively smoothly. In 2004, there were many complaints about the slow processing of reimbursements for NCMS-related expenses. In 2007, 87 per cent of the respondents stated that they had been reimbursed within a week. In some township health centres and county hospitals, patients did not need to apply for reimbursement: the final bill was reduced by the amount covered by the NCMS. This finding is consistent with Brown et al. (2009).
4.2 Shortcomings and challenges

4.2.1 Stagnant share of participants who were reimbursed

While the preceding evidence suggests that the NCMS programme initially seems to be doing well in terms of its reimbursement performance, closer scrutiny reveals a number of weaknesses, some of them serious. First, the household data show that the share of participants reimbursed did not rise between 2004 and 2007. In 2004, 22 per cent of the covered participants who sought medical attention were reimbursed for at least some share of their expenditures. In 2007, only 21 per cent were reimbursed (although the drop between 2004 and 2007 is not statistically significant).

4.2.2 Decreasing reimbursement rate for catastrophic medical payment

This insignificant change in the share of those who were reimbursed may have occurred if the NCMS programme had shifted its emphasis from reimbursing those 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, 36 per cent of those who received reimbursement incurred expenses amounting to less than 200 yuan. An even larger proportion (41 per cent) of all of those who received reimbursements incurred expenses ranging between 200 and 2,000 yuan. In other words, 77 per cent of those who received reimbursements incurred medical expenses of less than 2,000 yuan.

The tendency to favour reimbursements for those who incurred lower levels of expenditure is borne out by data that reveals the contribution of NCMS reimbursements to total health expenditure. Although overall the real reimbursement rate in 2007 for both inpatients (15 per cent) and outpatients (4 per cent) was higher than that in 2004 – (7 per cent for inpatients and 3 per cent for outpatients), the current NCMS programme does not appear likely to achieve its objective of helping rural residents in dealing with catastrophic illnesses.³ As seen in Figure 2, as one moves from expenditure categories (for inpatient care) of 200 to 2,000 yuan; 2,000 to 4,000 yuan; 4,000 to 10,000 yuan; and 10,000 yuan and above, the reimbursement rate falls. Notably, for those who suffered catastrophic illnesses (henceforth, the term for all illnesses in which the inpatient spent more than 4,000 yuan) the reimbursement rate was 11 per cent for illnesses costing between 4,000 and 10,000 yuan, and only 8 per cent for illnesses costing above 10,000 yuan, which was obviously not the policymakers’ aim.

According to the data collected as part of this study, the problem appears to be that rural residents are not being reimbursed at the levels being promised by the NCMS rules. In Table 2, the real reimbursement rate is compared with the promised reimbursement rate. Clearly, patients are not receiving what is being promised by the programme. Moreover, the gap widens as the severity of the illness (in expenditure terms) rises.

³ Our definition of catastrophic payment here is 4000 yuan, which is equal to annual per capita net income of rural residents in China in 2007.
The multivariate analysis also suggested that the impact of NCMS on the incidence of catastrophic medical payment is very weak although the detailed results are not reported in this paper because of space limitation.

4.2.3 High incidence of catastrophic medical payment

It is clear from the claims of the respondents who participated in the NCMS that in terms of providing funds for covering catastrophic illnesses, the programme is playing only a minor role. For example, in the case of inpatient care for catastrophic illnesses, the programme contributes only 9.8 per cent. In order to finance the rest of their medical expenses, rural households have to draw on their own savings (62 per cent), borrow from friends and relatives (16 per cent) and even sell off assets (12 per cent). Thus, while every little helps, the reimbursements from the NCMS programme are nowhere near a level where they provide credible insurance against the risks of catastrophic illness.

The descriptive statistics indicate that, although the incidence of catastrophic medical payment after reimbursement from NCMS declined significantly, the value was very small in 2007 (Table 3). Here, the incidence of catastrophic medical payment were defined as occurring where annual medical expenditure and out-of-pocket medical expenditure exceeded a certain share (100 per cent, 60 per cent, or 40 per cent) of annual per capita net income at village level. Obviously, different from the earlier definition of catastrophic medical payment of 4000 yuan (absolute value), this definition will help us take the regional differences in economic development into account. The data also suggest that the incidence of catastrophic medical payment in the poorest areas was much higher than in the richest areas before NCMS reimbursement, and that this situation did not change even after reimbursement. Moreover, the reduction of incidence of catastrophic medical payment by NCMS reimbursement in poor areas was much lower than that in richer areas, that is to say, the NCMS reimbursement played a more significant role in the reduction of the incidence of catastrophic medical payment in richer areas.

4.2.4 Constraints of financing to NCMS

Further analysis illustrates that the main problem is a lack of sufficient funds in the programme. In order to demonstrate this, we first total the contributions from the 7,175 individual participants, 25 local governments, and the central government. The localities for this sample of individuals would thus have at their disposal a total revenue pool of 358,750 yuan for insuring all illnesses of the covered individuals during 2007. As shown in Table 4, this amount falls far short of being able to cover all the programme’s commitments. If instead of being used as they were (columns 2 and 3 of Table 4), all the funds were used to reimburse inpatients with catastrophic illnesses for 21 per cent of their expenditures (a level that is still only half of what the programme promises), all the funds would be (more than) used up (columns 4 and 5). If the cost of illnesses in all the categories were to be reimbursed at the same rate, columns 6 and 7 of the table show that there were only enough funds to reimburse 16 per cent of inpatient care, even if nothing were assigned to outpatient care. It is obvious from these figures that the programme is severely under-funded, even to meet the promises currently made by the programme.

Table 3 Incidence of catastrophic medical payment at individual level by economic development, 2007

<table>
<thead>
<tr>
<th>Groups</th>
<th>Incidence of Catastrophic payment – 100 per cent</th>
<th>Incidence of Catastrophic payment – 60 per cent</th>
<th>Incidence of Catastrophic payment – 40 per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
<td>%</td>
</tr>
<tr>
<td>Poorest</td>
<td>8.84</td>
<td>8.39</td>
<td>5.09***</td>
</tr>
<tr>
<td>Poorer</td>
<td>11.02</td>
<td>10.62</td>
<td>3.63**</td>
</tr>
<tr>
<td>Middle</td>
<td>3.94</td>
<td>3.57</td>
<td>9.39**</td>
</tr>
<tr>
<td>Richer</td>
<td>3.58</td>
<td>3.08</td>
<td>13.97**</td>
</tr>
<tr>
<td>Richest</td>
<td>2.48</td>
<td>2.13</td>
<td>14.11**</td>
</tr>
<tr>
<td>Average</td>
<td>6.05</td>
<td>5.63</td>
<td>6.94***</td>
</tr>
</tbody>
</table>

Source: Authors’ data collected from household survey and village leader survey.

Note: Column 1 of every block is the incidence of catastrophic medical payment before reimbursement; Column 2 of every block is the incidence of catastrophic medical payment after deducting NCMS reimbursement; Column 3 of every block is the reduction of catastrophic medical payment by NCMS reimbursement, which is equal to (Column 1−Column 2)/Column 1*100%.

* significant at 10%; ** significant at 5%; *** significant at 1%.
In addition, because the average medical expenditure of participants is much higher than that of non-participants before the implementation of NCMS, adverse selection which exists significantly in this programme would have a huge impact on the financial sustainability of NCMS although the current high enrolment rate of NCMS buffered the negative impact of adverse selection.

4.2.5 Impact of NCMS on Village Clinics

The village clinic is the grassroots of the three-tier health system and has experienced dramatic changes with the introduction of economic reform. During the 1960s and 1970s, the village clinic was fully funded by villages (production brigades). With the introduction of the Household Contract Responsibility System, most village committees lost their ability to fund the development of village clinics and then lost the power to enable village doctors in their provision of primary health care to villagers. The barefoot doctors under the collective economy were becoming private practitioners and feeding themselves mainly by selling medicines.

Given the programme setting, the bulk of NCMS payouts for inpatient services and catastrophic outpatient services are supposed to flow into the township healthcare centre and upper level medical institutions. Thus, whether the village clinics, the grassroots healthcare service providers, once the most frequently visited medical institution by rural residents, could survive from the reform has been a concern.

Our analyses of how village clinic operations have changed under NCMS take three basic forms. For simplicity, we call these basic, full, and combined models. The basic model estimates how clinic outcomes are associated with a single NCMS measure (eligibility for NCMS reimbursement) controlling for a detailed set of clinics. The controlling variables were the number of doctors, doctor training, doctor age, size of service area, size of medicine stock and average village income per capita. Finally, to adjust for unobserved differences across villages and to account for common changes over time, we also include dummy variables for villages and years (in our case, for the year 2007).

Given substantial cross-county heterogeneity in NCMS policies, the full model then estimates how village outcomes are associated with distinct policy attributes of county NCMS programmes (hereafter policy attributes) in addition to the single NCMS measure. Results from the full model provide a more nuanced picture of specific behavioural mechanisms embedded in NCMS that might explain its impact. The three specific policy attributes that we analyse for clinics are NCMS availability to village residents, coverage of outpatient services at local township health centres, and household account requirements. The policy attributes that we study for individuals are the availability of NCMS reimbursement for village clinic services, NCMS reimbursement of outpatient services at township hospitals, and whether or not an individual’s family has a household account. All control variables included in the basic models are also incorporated into the full models.

Finally, to evaluate the combined impact of common county-level bundles of policy attributes, we specify three frequently-observed bundles of policy attributes (hereafter policy bundles): (a) reimbursement for inpatient services at township health centres and hospitals (from the common fund), (b) reimbursement for inpatient services at township health centres and hospitals from the common

### Table 4 Scenario analysis under the constraint of total revenue collection for sample population, 2007

<table>
<thead>
<tr>
<th>Medical expenditure</th>
<th>Mean</th>
<th>Freq.</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reimbursement rate (%)</td>
<td>Reimbursement (Yuan)</td>
<td>Reimbursement rate (%)</td>
<td>Reimbursement (Yuan)</td>
</tr>
<tr>
<td>0–200</td>
<td>129</td>
<td>11</td>
<td>16</td>
<td>228</td>
</tr>
<tr>
<td>200–2,000</td>
<td>1,173</td>
<td>150</td>
<td>16</td>
<td>28,162</td>
</tr>
<tr>
<td>2,000–4,000</td>
<td>2,930</td>
<td>102</td>
<td>16</td>
<td>47,818</td>
</tr>
<tr>
<td>4,000–10,000</td>
<td>5,943</td>
<td>106</td>
<td>21</td>
<td>132,291</td>
</tr>
<tr>
<td>&gt;=10,000</td>
<td>23,820</td>
<td>49</td>
<td>21</td>
<td>245,108</td>
</tr>
<tr>
<td>Total</td>
<td>418</td>
<td>418</td>
<td>377,399</td>
<td>363,749</td>
</tr>
<tr>
<td>Deficit</td>
<td>18,649</td>
<td>4,999</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ survey.

Note: The total revenue collection for the NCMS programme includes the premium paid by the sample population and subsidies from local government and central government. The total amount in 2007 equaled 358,750 RMB (=7,175 NCMS participants * 50 yuan per participant).
fund plus reimbursement for village clinics services from household accounts, and (c) reimbursement for inpatient and outpatient services at township health centres and hospitals from the common fund plus reimbursement for village clinics services from household accounts. (In other words, (b) = (a) plus household accounts, and (c) = (b) plus outpatient reimbursement.) To calculate the impact of each policy bundle, we use the full model to conduct joint significance tests of each bundle’s components. When justified by significant F-statistics, we then sum across policy components to obtain the implied net impact of each of the three combinations.

We present results for each type of model (basic, full and combined) in Table 5. The results from the basic model for village clinics show that clinic designation for NCMS reimbursement is associated with a 26 per cent increase in weekly patient flow and a 29 per cent increase in monthly gross income. However, annual net income and share of income from drug sales remain unchanged. Taken together, the gross and net income results suggest possible reductions in the provision of high profit margin specialty services as well as possible increases in unfunded clinic responsibilities under the NCMS (such as enrolling participants, managing patient reimbursement applications, complying with required facility renovations, and financing mandated clinician training – all of which may have raised costs but not net earnings).

The full model shows that clinic eligibility is positively associated with weekly patient flow, but no longer significantly so. Instead, simply being in a village with an NCMS programme is associated with a near-doubling of weekly patients (a 55 per cent increase – implying that NCMS programmes generate large spillovers for all local clinics that dominate the effect of eligibility for reimbursement). One possible explanation is that NCMS lowers the cost of medical care at township health centres, so patients are more likely to seek follow-up services and drug refills at more accessible village clinics. Estimates for clinic income follow the basic model’s general pattern and also match the full model patient flow results. Clinics in NCMS counties experience large increases in gross income (71 per cent) regardless of clinic eligibility for reimbursement but no change in net income or share of income from drug sales. Consistent with studies of medical savings accounts (in combination with greater regulation and oversight) (Yip and Hsiao 1997; Hsiao 2001), household account requirements are associated with substantial reductions in weekly patient

### Table 5 Impact of NCMS on village clinics

<table>
<thead>
<tr>
<th></th>
<th>Log weekly patient flow</th>
<th>Log monthly gross income</th>
<th>Share of monthly income from medicine sales</th>
<th>Log annual net income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic</td>
<td>Full</td>
<td>Comb.</td>
<td>Basic</td>
</tr>
<tr>
<td>Eligibility for NCMS</td>
<td>0.26***</td>
<td>0.22</td>
<td>0.29***</td>
<td>0.18</td>
</tr>
<tr>
<td>Reimbursement rate</td>
<td>0.07 (0.07)</td>
<td>0.15 (0.03)</td>
<td>0.29 (0.73)</td>
<td>0.46 (0.47)</td>
</tr>
<tr>
<td>NCMS village</td>
<td>0.55*</td>
<td>0.71***</td>
<td>-0.25</td>
<td>0.24 (0.15)</td>
</tr>
<tr>
<td>Outpatient</td>
<td>0.28</td>
<td>-0.06</td>
<td>0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Reimbursement available at township health centre</td>
<td>-0.39**</td>
<td>-0.33</td>
<td>-0.05</td>
<td>0.13</td>
</tr>
<tr>
<td>Family accounts</td>
<td>-0.39**</td>
<td>-0.33</td>
<td>-0.05</td>
<td>0.13</td>
</tr>
<tr>
<td>Policy Bundle A</td>
<td>0.55***</td>
<td>0.71***</td>
<td>-0.25</td>
<td>0.24 (0.15)</td>
</tr>
<tr>
<td>Policy Bundle B</td>
<td>0.38***</td>
<td>0.38***</td>
<td>-0.24***</td>
<td>0.00</td>
</tr>
<tr>
<td>Policy Bundle C</td>
<td>0.66***</td>
<td>0.56***</td>
<td>-0.22**</td>
<td>0.04</td>
</tr>
<tr>
<td>Constant</td>
<td>3.75***</td>
<td>3.60***</td>
<td>7.61***</td>
<td>7.42***</td>
</tr>
<tr>
<td>Observations</td>
<td>301</td>
<td>301</td>
<td>301</td>
<td>301</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.64</td>
<td>0.66</td>
<td>0.71</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Note: Only key variables are reported in this table. And robust p-values reported in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.
flow (39 per cent) and nearly significant reductions in gross clinic income (as individuals spend account funds more like their own money because they can be saved for catastrophic needs or spent in subsequent years). Outpatient reimbursement of township health centre services is not associated with any village clinic outcome.

The combined model results present cumulative effects for common NCMS policy bundles. Estimates and levels of statistical significance for policy bundles (a), (b), and (c) are sums across full model estimates for individual policy attributes and corresponding F tests of their joint significance. Panel A’s clinic results for policy bundle (a) generally correspond to those of the basic model. The results for benefit policy bundle (b) are qualitatively similar, suggesting that reductions in patient flow and gross income associated with household accounts are dominated by increases associated with inpatient coverage. The most comprehensive of the three policy bundles is associated with larger patient flow and gross income gains (again perhaps due to spillover effects of coverage at township health centres). Policy bundles (b) and (c) are also associated with reductions drug sales as a share of clinic revenue (24 per cent and 22 per cent, respectively). No bundle, however, is associated with a significant change in village clinic annual net revenue.

Overall, we find that NCMS has increased clinic patient flow and gross income – but not net revenue. Increases in patient flow and gross – but not net – clinic revenue may reflect desirable reductions in more specialised high profit margin services and drug sales. However, they may also raise important questions about uncompensated burdens that the NCMS has shifted to village clinics. Specific new responsibilities for which clinics are not paid include enrolling participants, managing patient reimbursement applications, complying with required facility renovations and financing additional mandated clinician training. In fact, many village clinicians participating in our survey reported that NCMS has hurt their overall business. Given renewed interest among China’s policymakers in emphasising primary care, future work is needed to more closely examine the impact of the NCMS on rural primary care facilities.

4.2.6 Implications for future research and policy reform
In this paper, using nationally representative household survey data, we evaluated the impact of NCMS, which is an important component of social protection in rural China, on rural residents and primary healthcare providers. The expansion of NCMS is surprising. Our data showed that the NCMS has reached 100 percent of villages, nearly 90 per cent of rural individuals are covered by the NCMS on a voluntary basis, and the programme design is improving. This effort is an important indicator that the Chinese government is trying to reduce the inequality between the rural and urban populations through funding these programmes. Our survey also showed that 82.2 per cent of respondents thought that the central government is paying more attention to rural population than their counterparts in urban areas.

However, this programme still has a long way to go if it is to meet its own goal of helping rural residents minimise the financial risks of catastrophic illnesses. The programme reimburses rural residents for only a small share – less than 15 per cent – of their total healthcare costs. More troubling, the reimbursement rate falls as the severity of the illness (in expenditure terms) rises. The effect of NCMS in reducing the incidence of catastrophic medical expenses is very limited. In this area, there also still exists significant gaps between regions.

We have shown in a simple quantitative accounting exercise that the fundamental problem is that the programme is underfunded, lacking the resources to meet its promises. In March 2009, the Central Committee of the CPC and the State Council issued a statement, ‘Deepening the Reform of the Medical and Healthcare System’. The statement highlighted the health insurance system and the government promised that the government (central and local) would increase the subsidy further to 120 yuan for each participant in 2010. However in reality, even if the funding of the NCMS programme achieved this increase it could still not meet the promised level of reimbursement for catastrophic illnesses, given the price elasticity of healthcare expenditures, let alone outpatients.

In addition, although the increase in medical expenses both in poor and rich areas may indicate that rural residents used more medical services due to the implementation of NCMS, our study could not identify how much of this increase should be attributed to rises in medical service prices and the purchase of inefficient medical services. Yip and Hsiao (2008) has concluded that the primary question is which agency can be entrusted to act in the best interests of the people. The increases in patient flow and gross, but not net clinic income might reflect desirable reductions in the provision of specialised, high profit margin services and rates of drug sales. However, it is not clear whether the NCMS has
changed the behaviours of other rural healthcare providers such as township health centres that NCMS heavily relied on. Thus, the impact of NCMS on rural primary healthcare providers deserves more attention. Otherwise, broader and deeper health insurance coverage would translate into a more resource-intensive style of healthcare (Wagstaff et al. 2009b).

It is clear that the government has tried to keep patients in lower level facilities in order to reduce medical costs and improve efficiency. However, it can be seen from our study, and from others, that people cannot get reimbursement from NCMS where they seek medical care in non-NCMS-contracted health facilities (Brown et al. 2009). Why do these people ignore the chance of reimbursement from NCMS? We must admit that one of the reasons is that the quality of medical services provided by lower level facilities are often poor, especially in poor areas. To some extent, patients in poorer areas have to pay more for equal medical services than those in richer areas although they earn less. This is one possible reason for higher incidences of catastrophic medical payment in poorer areas. Moreover, as financial health is undermined by uncompensated NCMS-related responsibilities, the village clinics might not have enough resources to invest in the improvement of service quality in the long run.

If China is to develop a more comprehensive healthcare system, the current NCMS programme will have to evolve a long way. Certainly part of the problem appears to be that the county is the unit of governmental jurisdiction that is ultimately responsible for covering the liabilities of rural health insurance. The fundamental concepts of insurance provision would suggest that there are many flaws in 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 and the NCMS performs worse in poorer areas in reducing the incidence of catastrophic medical payment than it does in richer areas. Counties simply do not have the funds to meet their programme commitments. Even in counties with some level of fiscal surplus, it is difficult to understand how any county could be thought to have the technical and financial capabilities to run a complicated health insurance programme. To conclude, more flexible programmes are needed if the rural NCMS programme is to meet its needs, and it is difficult to see how current funding arrangements will ever enable it to meet these needs efficiently and comprehensively.
7 List of outputs

7.1 Publications

Singer, Kim B.; Miller, Grant; Yi, Hongmei; Zhang, Linxiu and Rozelle, Scott (2010) 'New Evidence on the Impact of China’s New Cooperative Medical Scheme and Its Implications for Rural Primary Healthcare: multivariate difference-in-difference', BMJ 341: c5617


7.2 Policy Brief
Zhang, Linxiu; Yi, Hongmei; Luo, Renfu; Huang, Jikun and Rozelle, Scott (2008) ‘NCMS: Policy Assessment and Suggestions for Improvement (Internal)’, 5 [This brief has been recognised by high-level decision-makers]

7.3 Conference Papers


7.4 Working Papers
Singer, Kim B.; Miller, Grant; Yi, Hongmei; Zhang, Linxiu; Rozelle, Scott (2010) Impact of China’s New Cooperative Medical Scheme on Township Health Centers, Beijing: CCAP


References


World Bank (2009) From Poor Areas to Poor People: China’s Evolving Poverty Reduction Agenda – An Assessment of Poverty and Inequality in China, Poverty Reduction and Economic Management Department, East Asia and Pacific Region, Washington: World Bank


