

# A STUDY TO INVESTIGATE THE VARIABLES THAT CONTRIBUTE TO INEFFICIENCIES IN THE CHINESE HEALTH-CARE SYSTEM

**XIULI HAN**

Research Scholar of Lincoln University College Malaysia.

**TUKIMIN BIN SANSUWITO**

Lecturer of Lincoln University College Malaysia.

**SARINA BINTI JAMALUDDIN**

Lecturer of Lincoln University College Malaysia.

**Dr. SANDEEP SHRESTHA**

Professor of Lincoln University College Malaysia.

## Abstract

The authors of this paper advise Chinese policymakers to look at measures to provide equal access to health care and reduce supplier-induced demand. Outpatient and inpatient care benefit packages under the NCMS need to be improved, as well as the provision of additional benefits for low-income households. Aside from changing the payment structure for providers, the government should also control provider conduct and take many additional steps to avoid overprescribing drugs and providing excessive healthcare services. The impoverished have consistently poorer health results (World Health Organization, 2008, World Health Organization, 1996). There is a lot of focus on reducing health inequity and increasing the average level of population health in both developed and developing countries. These policies aim to reduce socioeconomic inequities and disparities related to health outcomes and accessibility as well as health financing equity inequities that exacerbate access issues. In recent years, the subject of health and healthcare disparities has piqued the interest of many Chinese citizens. Since the introduction of comprehensive market reforms in 1978, China's economy has expanded at an impressive rate. However, while China's economic growth has brought significant improvements in population health, these gains have not been distributed equally, leading to growing healthcare inequalities. An increasing amount of data indicates that the gap between the affluent and the poor in terms of health care is expanding (Akin et al., 2004, Gao et al., 2002, Liu et al., 2012b, Luo et al., 2009, Meng et al., 2012, Yip and Hsiao, 2009a). Chinese poor had higher death and morbidity rates than affluent between 1980 and early 2000, according to government figures. They also use fewer health care while having larger requirements (Centre for Health Statistics and Information, 2008). Insurance coverage was very inadequate, and the majority of rural Chinese farmers were without any form of protection from the disaster. When it came to health care financing, most Chinese families couldn't afford it because of out-of-pocket (OOP) expenses (Gu 2008).

**Keywords:** NCMS, out-of-pocket (OOP), socioeconomic, healthcare, World Health Organization

## 1. Introduction

Destroying the Cooperative Medical Scheme (CMS), which provided 90 percent of rural residents with access to basic healthcare throughout the 1980s was made possible by the deconstruction of communal farms (Liu and Yi, 2004). Around 95% of rural residents lacked access to health insurance by the early 2000s (Babiarz et al., 2010, Yip and Hsiao,

2009b). A national survey found that three-quarters of rural inhabitants did not seek medical attention when suggested; at the same time, rural inpatient costs jumped from 613 RMB to 2,649 RMB over the course of a decade (Chen et al., 2011, you and Kobayashi, 2009).

Access to health care in rural areas in China has worsened after the introduction of China's New Cooperative Medical Scheme (NCMS). The NCMS is a government-subsidized health insurance scheme that is operated at the county level. One of its primary objectives is to alleviate the financial pressures rural residents have when it comes to healthcare. China's National Health and Family Planning Program (NCMS) have grown tremendously since its beginnings, covering 97.5 percent of the country's rural population by 2012. (China Daily, 2012).

Despite the NCMS' quick development, its ability to reduce rural people' financial difficulties in paying for healthcare should not be assumed. Several studies have found that medical expenses and out-of-pocket payments, especially for catastrophic illnesses, have decreased since the program was launched (Wagstaff et al., 2009a, Wagstaff et al., 2009d, Tan and Zhong, 2010, Babiartz et al., 2012), but other researchers found that OOP payment for health services remains a severe financial burden for subscribing rural households and that the financial protection provided to participants was in fact rather limited (Babiartz et al., 2012, Wagstaff et al., 2009a, 2009b) (Sun et al., 2010, Zhang et al., 2010a). It is possible that the NCMS may have raised medical expenditures at village clinics and township health facilities, which tended to prescribe too many medications for NCMS-covered patients (Sun et al., 2009a, Sun et al., 2009b).

Outpatient care has been included in the NCMS benefit package since 2007 in an effort to increase rural farmers' consumption of outpatient care, which is the most commonly utilized and generally accessible form of treatment. Chronic and severe chronic problems qualify as catastrophic outpatient care, whereas non-catastrophic outpatient care qualifies as normal outpatient treatment. According to earlier NCMS research, inpatient care is the primary emphasis, but this new project focuses on outpatient care utilization in rural regions. To determine if the enlarged benefit package may lead to supply-induced-demand of outpatient usage, it is required to examine the effects of China's social health insurance (Yip et al, 2010, Wagstaff et al, 2009c; Tang et al, 2012). There is a pressing need to examine the health care expenditures borne by rural inhabitants at village clinics and township health facilities, but so far no comprehensive analyses of these prices have been carried out.

A longitudinal household survey, CHNS, is used to investigate these concerns by tracking the impact of NCMS on outpatient expenses. Due to its comprehensiveness and recentness (2004 and 2009 surveys), data from the NCMS survey are ideal for this study because they cover the entire time period from the NCMS's inception in 2003, through its initial rapid growth, and into the years immediately following an important benefit

extension to include outpatient care in 2007. Three modeling methodologies are used in our study. A sample group of persons from 2004 (the year before the NCMS began) to 2009 (the year after the NCMS began) were compared to see how their average outpatient expenses changed over time (when all participated in the NCMS). In order to estimate the impacts of the NCMS on outpatient care use, outpatient costs prior to the NCMS reimbursement, and OOP payments for outpatient care, another approach is to use pooled data from the most recent two rounds (2004 and 2009) of the CHNS (Gravelle et al., 2006, Jones, 2007, O'Donnell et al., 2008b). This approach makes use of a Two-Part Model (2PM) and Heckman Selection Model (HSM) (after the costs are reimbursed by the NCMS). The NCMS' impact on outpatient expenses was estimated using a Propensity Score Matching (PSM) and Difference-in-Differences (DID) model in the third method.

## 2. Literature Review

Even though insurance's most fundamental justification is that it decreases health costs and protects families financially, it is not clear in the actual world how much health insurance reduces health costs or how much health insurance helps to reduce health costs. According to Heath economists,

Patients may benefit from their health condition and financial riches, as well as extra medications and treatments that may boost the likelihood of a recovery, if they are aware of the sorts and range of health services that are covered by insurance. In this situation, a robust insurance plan may lead to an individual's increased demand for health care because insurance lowers the cost. Providers' willingness to deliver additional services might be influenced by the fact that their clients had health insurance, which would result in higher OOP payments. Some of the most recent studies have been published in (Chen, 2006, Eggleston et al., 2008, and Zhan et al., 1998).

Questions persist about whether the NCMS has had a positive influence on healthcare costs, and in particular if it has reduced patients' out-of-pocket expenses. However, it's possible that the availability of insurance claims has prompted healthcare providers and doctors to prescribe more expensive drugs or order unnecessary treatments, resulting in an increase in overall healthcare expenditures. Participants may observe a decrease in OOP payments for health care if the first of these two impacts prevails. Participant out-of-pocket costs might rise if the second effect is more pronounced, as the growth in healthcare expenditures surpasses the quantity of insurance reimbursement claims.

In spite of this, a number of studies have shown that NCMS has decreased out-of-pocket expenses and safeguarded families from financial risks by decreasing the costs of catastrophic sickness, especially among low-income patients. OOP payments after enrollment remained a financial hardship for rural families, and NCMS financial protection was found to be relatively minimal, researchers concluded (Sun et al., 2010). Even though

most rural regions were covered by the NCMS, deductibles and co-payments were high, and OOP payment was not decreased by the NCMS, as Zhang et al. (2010b) pointed out. As a matter of fact, several studies have revealed that the NCMS resulted in consumers receiving more unnecessary and expensive healthcare. There has been a dramatic rise in the number of people Disadvantaged groups received larger out-of-pocket payments (Long et al., 2010).

The present Chinese healthcare system promotes clinicians to give the most advanced care feasible, as has been extensively documented. Researchers claimed that present provider payment mechanisms based on the FFS system offered providers skewed incentives and were not conducive to cost control (Li et al., 2011). Healthcare facilities rely largely on medicine income and health service revenue to exist, which may be further exacerbated by insurance such as the NCMS. (Latker, 1999; Yip and Hanson, 2009; Yip et al., 2008a). After the NCMS was implemented, for example, the rate and expense of caesarean sections rose dramatically in rural regions (Bogg et al., 2010). Over-prescription of antibiotics at village clinics for NCMS patients was also shown to be widespread, according to studies (Sun et al., 2009b, Bogg et al., 2010). As a result of the National Center for Health Metrics and Evaluation (NCHME) initiative, village clinics and township health centres in NCMS-covered counties generated more money than equivalent institutions in non-participating counties (Babiarz et al., 2012). (Wagstaff and Lindelow, 2008).

Studies to far have helped us get a better understanding of the NCMS's influence on medical expenses, but there are still many significant gaps in knowledge that may help shape policy. Before 2007, the NCMS's outpatient care coverage was expanded, but no research has yet examined the program's influence on outpatient care expenditures after 2007. No systematic comparison of expenses spent at different health facilities has been done, despite the fact that cost escalation has been researched at village clinics and township centres (Babiarz et al., 2012, Brown and Theoharides, 2009). In addition, the effort to demonstrate a causal link between the insurance and health care expenses isn't as robust as it may be. There have been various research that has contributed to the wide variety of provider payment incentives, but relatively few have suggested what more thorough examination would show; consequently, conclusions are by far still anecdotal. Individual-level data, such as multivariate regression analysis, is needed to separate or control other factors that may impact health expenses, or to determine how much.

### **3. Research Gap**

To meet our needs, the survey data (from 2004 to 2009) covers the whole time from NCMS' beginning in 2003 to the early years of its outpatient coverage extension in 2007. As seen in Table 6.1, the NCMS grew rapidly from 2004 to 2009: In 2004, less than 5% of rural inhabitants were enrolled in the NCMS, but by 2009, more than 90% were. Since 2007, four provinces (Henan, Hubei, Liaoning, and Guangxi) have started to compensate

catastrophic outpatient treatment in the nine provinces examined by the NCMS. Catastrophic healthcare and general outpatient services were included to the NCMS benefit package in all examined provinces by 2008, according to data from the People's Daily, People's Daily and Ministry of Health of Guangxi Province, as well as from Hao and Yuan and Hu et al. (2008).

Using the CHNS poll to draw policy conclusions has two possible drawbacks, according to our study. There are just nine provinces covered in the study, most of which are located in the eastern and southern regions.

CHNS data should be used with caution when generalizing to national circumstances because the coastline region of China is a distinct area. Second, both supply and demand have an effect on outpatient costs. It was impossible for us to examine the impact of supply-side characteristics like the number of doctors in a health facility, ownership structure, and the number of medical facilities in a certain geographic area in our research since the CHNS survey does not provide this information. Finally, the healthcare recall period is just four weeks. A four-week span isn't long enough to cover all of the healthcare demands of a whole population. Most polls allow for a memory span of 12 months.

Pre- and post-insurance outpatient expenses are the dependent variables, and their occurrence is determined by the dependent variables. The CHNS has a four-week payment window for health care. Individuals are requested to provide the proportion of their health care costs that the NCMS is able to reimburse. Pre- and post-reimbursement health payments are constructed using these two factors. The Consumer Price Index (CPI) was used to alter the costs of health services in China because of the country's high inflation rate. As stated in the China Statistical Yearbook 2005 and 2010, using 2009 as a base year, CPIs for 2004 are 0.927 (National Bureau of Statistics of China, 2005, 2011 and 2007, respectively)

Knowing that NCMS was initially deployed in 2003, it is apparent that the rural cooperatives that joined the NCMS after that date are covered by the NCMS. ' (Lei and Lin, 2009). In addition to NCMS membership, the model takes into account a number of other factors that may influence outpatient care utilisation and outpatient care costs. This comprises both health-related and non-health-related variables that are regularly utilised in the literatures (Hernandez Quevedo and Jimenez Rubio, 2009, Gravelle et al., 2006, Jones, 2007). Health need factors are accounted for by age, gender, and morbidity type in the model. If you're sick, you're classified into one of four categories: Type 1: fever; Type 2: aches and pains in the joints and muscles such as rashes; Type 3: infectious illnesses; Type 4: non-communicable diseases. Family income, education, and work experience all play a role in determining non-necessary components.

Status, location, and time of year employing Equivalence Scales, per-capita income is computed (Citro et al., 1995). No education, elementary and secondary, high school and technical, and university and above are all examples of educational levels. Those with a

bachelor's degree or higher are considered to be in the reference group. Village clinics, township hospitals, county and city hospitals, private clinics, and other health institutions are classified into five types. Village clinics serve as a benchmark for all other clinics. The province variable is assigned to Guizhou province as a reference group for the province variable. September to December and January to March are two distinct seasons. The period from January to March serves as a benchmark. Table 6.2 offers the data set's descriptive statistics.

#### **4. Research Objective & Methodology**

The impact of NCMS on outpatient care costs was estimated using three different modeling methodologies. As a first step, we compared the average outpatient expenses for a particular set of persons between 2004 (when no one participated in NCMS) and 2009 using the panel structure of the CHNS survey (when all participated in NCMS). In the 2004 CHNS survey, 96% of respondents were not covered by NCMS, however in the 2009 study, 93% were. Individuals aren't being compared to one another, therefore using the entire sample to compute the average might introduce selection bias. Propensity Score Matching (PSM) has traditionally been used to reduce selection bias by matching samples with comparable features. While PSM can rectify selection bias based on observable characteristics, it is limited in its ability to do so. Problems arise when trying to figure out how to account for a variety of previously unobserved personal traits that have persisted over time and might affect how often and how much outpatient treatment would cost.

A total of 1,954 people who were questioned in 2004 but didn't engage in NCMS were re-interviewed in 2009, when NCMS was used by everyone, according to this study (Table 6.3). In 2004 and 2009, 186 of these people provided information on their outpatient costs. People who were uninsured in 2004 and covered by health insurance in 2009 are used as the basis for a mean comparison. We are able to account for sample characteristics that are not changeable over time by employing the approaches.

NCMS' influence on rural China's outpatient care expenses was examined in the study, and some startling new conclusions emerged. Since the new effort was established in 2009, outpatient treatment expenditures for the program's participants have been much higher than those for the uninsured. Village clinics, township hospitals, and private clinics are the worst hit by this pre-reimbursement price gouging. There has been a rise in the cost of health insurance in nations other than China. Increased usage of high-tech obstetric procedures and greater caesarean delivery rates in Chile were attributed to the availability of private health insurance in the country (Murray and Elston, 2005). Prescription medication coverage also had a favorable impact on the usage of specialty care (Allin and Hurley, 2009). In the late 1990s, China's urban health insurance programme saw a rise in costs before the introduction of NCMS for the rural population. Health care practitioners were encouraged to prescribe expensive pharmaceuticals and

high-tech diagnostic procedures, which had better profit margins, as a result of these schemes (Wagstaff and Lindelow, 2008).

Patients' insurance claims from NCMS may also have influenced participating health facilities and doctors to prescribe more expensive drugs or order unnecessary treatments throughout our study period (2004-2009). This phenomenon has been documented in the literature" (Yip et al., 2010, Yip and Mahal, 2008, Wagstaff and Lindelow, 2008). Before and after rural residents signed up for NCMS, the average cost of outpatient treatment per episode was comparable. Even though OOP payments were lowered after claims were made, it appears from this data that the NCMS is related with an increase in pre-reimbursement per episode outpatient health expenses for its members throughout the time period examined (gross billings before claims were filed). In this case, we'll use

Pre-reimbursement expenses for outpatient treatment for rural NCMS members are 40% higher than for non-subscribing, uninsured individuals, according to DID study. Due to this limited influence on outpatient expenses, the NCMS may see a surge in OOP payments for NCMS-billed outpatient treatments rather than decrease them.

## 5. Data Analysis & Findings

In this situation, more government subsidies aimed at offsetting growing NCMS expenses may only lead to more cost escalation unless the programmer can utilize its purchasing and third-party payer status to implement cost-saving initiatives in participating health care institutions.

Village clinics and township health centers, where rural residents are most likely to seek outpatient treatment, appear to be under more pressure to raise prices than bigger institutions. Patients who are covered by the NCMS pay much more for outpatient care at village clinics and township health centers than those who are not. The NCMS encourages its users to seek care in low-level health institutions that are most accessible to rural populations; the claims reimbursement rates for care supplied in these, tiny local health facilities, are the highest offered by the programmer. These similar venues got fewer government subsidies through the NCMS than other institutions, such as larger health facilities, over the time period analyzed. While some NCMS money was available in the local area, it may have contributed to increased fees for participants because of the local institutions' financial difficulties. It's possible that much of the government funding meant to help participants pay for healthcare has instead been swallowed by the unquenchable need for revenue and cost coverage at these smaller rural health institutions.

NCMS' quick growth through substantial government subsidies has thus far had no impact on enhancing outpatient care access or decreasing out-of-pocket costs at participating health institutions, given these concerns. According to our research, rural inhabitants are more likely to be affected by climate change than those in urban areas.

Uninsured residents who do not subscribe to NCMS are more likely to seek outpatient treatment than those who are covered by NCMS. Our study found no indication that NCMS lowers outpatient OOP payments. As a result of providers' efforts to improve outpatient treatment, the total cost of outpatient care has grown, resulting in no overall cost reduction for outpatient participants, despite claims payments through NCMS.

For the sake of rural citizens, it is imperative that further study is done into how and to what degree NCMS has and may continue to increase health care costs for lower-level providers. These tiny facilities may be obliged to raise reimbursable charges to make ends meet due to a mandate for better services to their rural customers and a lack of cash. As a result, participants in the program aren't worse off than non-participants when it comes to OOP payments per episode of care, but they don't receive the savings that the program was supposed to deliver over earlier, uninsured levels of expenses.

Medical costs at all levels of health institutions must be carefully examined before policymakers can pinpoint the core reasons of this problem. For China's enormous rural population, the expected advantages of a health insurance scheme will be impossible to materialize unless the governance structure supporting it is understood (Ramesh et al., 2012). Aside from addressing growing healthcare costs, new steps to improve NCMS should also focus on creating and executing cost management reforms in participating health service institutions in order to maximize public funding over the long run. Rural members have a higher chance of saving money on medical care under NCMS if expenses can be kept under control.

## 6. Conclusion

An underlying goal of this thesis was to examine China's healthcare disparities and inefficiencies. In order to answer these questions, this thesis focused on: Whether or whether China's healthcare system suffers from a lack of equity and efficiency is an open question. In rural China, how much of an impact does the rural insurance program have on healthcare disparities and inefficiencies? There has been an increase in income-related health disparities between rural and urban China, which is examined in this thesis. To better understand which socioeconomic or income categories are impacted by certain health concerns, the study focuses on the distribution of health outcomes for urban and rural populations. Mainly, it discusses rural health insurance reform and its effect on health disparities. Although the NCMS has achieved some of its primary aims of extending coverage and improving consumption of particular services, there is still a lack of equality in this system. There is little emphasis on outpatient care, which often covers the "basic" and most cost-effective treatments, in the coverage package. Even if a household is covered by the NCMS, outpatient care expenditures may still be deemed catastrophic and even a poverty trap for some households. Studying the NCMS's connection to rising healthcare costs sheds light on the problem of inefficiency in health care delivery. Doctors and hospitals may raise demand for individuals with health

insurance, according to this theory, which implies that the NCMS might respond to certain cost increases.

The empirical chapters' findings are summarized in the first section of this chapter. On the heels of recent government efforts, such as NCMS, this paper outlines some policy recommendations for improving China's healthcare system and addressing disparities and inefficiencies there. Limitations and future research plans are also included in this section.

The primary focus of this thesis is to determine whether or not China's healthcare system in the 2000s is unfair or inefficient, and if so, how the NCMS addresses these problems. There are several types of health disparities that are examined in this thesis, such as socioeconomic factors that influence health outcomes, access to care that is unequal across communities, catastrophic medical costs, and the consequent financial hardship that results from these costs. It raises worries regarding affordability for the poor by analyzing data from the CHNS of 2004, 2006, and 2009. The problem is that those who are NCMS-insured are more likely to utilize folk doctor care and less likely to use preventative care than those who are not. They may also be unable to afford the care they require or may be required to spend a significant portion of their salary on it. This thesis examines China's healthcare system's inefficiencies. NCMS may worsen the problem of healthcare inefficiency since it may lead to an increase in healthcare costs. To achieve NCMS's stated goal of providing financial security for rural Chinese residents, the paper contends that the systemic inequities inherent in China's healthcare system must be addressed in order to do so.

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