

# Do Different Health Insurance Plans in China Create Disparities in Health Care Utilization and Expenditures?

Hai Fang<sup>\*</sup>, Qingyue Meng, and John A Rizzo

Peking University, Peking University, and State University of New York at Stony Brook

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**Abstract:** China has recently reformed its health care system with the intent of providing universal coverage for basic health care to every Chinese citizen. This study investigates whether different health insurance plans have created disparities in health care utilization and expenditures. This study uses 9,329 respondents from 2009 China Health and Nutrition Survey. Health utilization is measured as uses of preventive care services and the probability of seeing a doctor when sick; health expenditures are measured as total medical expenditures for physician treatment and the percent of costs covered by insurance. Respondents under urban employee-based health insurance are more likely to receive preventive health care services (odds ratio = 1.64; 95% CI: 1.03, 2.60) than those under the rural newly cooperative medical scheme. There are no significant disparities in terms of seeing a doctor when sick and total health expenditures, but the reimbursement of urban employee-based health insurance is 25% (95% CI: 17.49, 35.87) greater than other two health insurance plans. In order to create truly universal health care coverage for all the Chinese population, China should seek to eliminate disparities in health reimbursements under its various health insurance plans and encourage uses of preventive care services.

*Keywords:* health insurance, health disparity, China

*JEL Classification:* I11; I13

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## 1. Introduction

China has achieved significant economic development, averaging more than 10% annual growth in Gross Domestic Product (GDP) since the Reform and Opening Policy in 1978 (National Bureau of Statistics of China, 2010). In 2010 China was the second largest economy in the world with a GDP of US \$5.8 trillion after the United States (BBC, 2011). However, China's health care system did not match this rapid economic development during the same period. To bridge this gap, China has substantially reformed its health care system in recent years (Li et al., 2012; Yip et al., 2012). The ultimate goal is to provide universal coverage for basic health care to every Chinese citizen (Yip et al., 2009; Barber and Yao, 2011, Meng et al., 2012; Tang et al., 2013). Three major health insurance plans, namely, the rural newly cooperative medical scheme, urban resident health insurance, and urban employee-based health insurance have recently been launched to achieve this objective. Each plan operates independently, and contributions come

from a variety of sources, including the central government, local governments, employers, employees, and residents (Hsiao and Maynard, 2009). In 2009, these three health insurance plans covered approximately 1.2 billion people (90% of the Chinese population). The present study is the first to compare the three health insurance plans, examining whether they have created disparities in health care utilization and expenditures, as some of these plans are newly launched.

The major distinguishing features of these plans are that the availability of a specific health insurance plan depends on one's employment status and/or residency status (urban vs. rural). Prior to the Reform and Opening Policy in 1978, urban employees and retirees as well as their dependents could receive partial reimbursements for their medical expenditures from their employers, but unemployed urban residents lacked any coverage. In rural areas, a cooperative medical scheme covered almost all residents, and was very effective in the 1950s – 1970s in terms of reducing mortality and morbidity in China. Following the Reform and Opening Policy in 1978, due to low productivity and the use of outdated technology many state-owned enterprises in urban areas went bankrupt while the collective economy in many rural areas virtually collapsed. Thus, reimbursement for medical care became quite limited with most medical expenditures paid for out-of-pocket by both urban and rural residents in China. In rural China, lack of demand for voluntary community financing plans and inadequate government policies were two major problems in the development of the health insurance system in the 1990s (Liu, 2004). In urban China, health access of the urban population, particularly the poor, to professional health care services had declined and became more inequitable since the early 1990s due to the lack of health insurance coverage (Gao et al., 2001). In response to this, the Chinese government decided to reform the entire health care system, resulting in the three separate health insurance plans, which we describe in more detail below.

## **2. Three Major Health Insurance Plans in China**

### **2.1 The Rural Newly Cooperative Medical Scheme**

The cooperative medical scheme was initially implemented in rural China in the 1950s (Yip and Hsiao, 2008; Lei and Lin, 2009). The old cooperative medical scheme was financed by the rural collective economy, and one village clinic provided health services to all the residents in the village. Due to the collapse of the rural collective economy, the old cooperative medical scheme was nearly bankrupted in the 1980s. In 2003, the rural newly cooperative medical scheme was launched (Chinese Ministry of Health, 2003). Participation is voluntary but at the household level, so either all or none of the household members participate in this new rural cooperative medical plan. In order to pool health risks at a more aggregated level, the plan is no longer administrated by individual villages. Instead, a county-level administration is required with individual premium contributions and subsidies from the central and local governments. In 2011, the rural newly cooperative medical scheme covered nearly every rural resident in China. Its

coverage focuses on catastrophic illness for inpatient and outpatient services and excludes some basic outpatient health care services such as annual physical exams and treatment for the flu. The government subsidies in 2010 were 120 Chinese Yuan, and increased to 200 Chinese Yuan in 2011 (1 US dollar = 6.3 Chinese Yuan in 2011). Inpatient reimbursement rose by 60 to 70 percent in 2011 after deductibles, and the maximum recommended reimbursement amount has also been raised from 30,000 Chinese Yuan to 50,000 Chinese Yuan (Chinese Ministry of Health, 2011). However, coverage for outpatient health care services and/or annual physical exams also differs across rural areas (Lei and Lin, 2009; Brown and Theoharides, 2009; Yi et al., 2009).

## **2.2 Health Insurance for Unemployed Urban Residents**

Prior to 2007, nearly all unemployed urban residents lacked any health insurance coverage (the dependents of employees may have been partially covered by the urban employee-based health insurance, however), and health care costs were paid for completely out-of-pocket. In 2007, China launched a new health insurance plan to cover unemployed urban residents (Chinese State Council, 2007). Young children less than 6 years old, students, and other unemployed residents in urban China were covered by this urban resident health insurance plan, with individual premium contributions and subsidies from the central and local governments. Like the new rural health plan, its coverage also focused on catastrophic illness for inpatient and outpatient services, while denying coverage for some basic outpatient health care services. Participation is also voluntary, but again on a household-level basis. The system is administered at the city level (Lin et al., 2009).

## **2.3 Urban Employee-Based Health Insurance**

With the rapid growth in foreign investment enterprises and bankruptcies of state-owned and collective economies, the need for comprehensive employee-based health insurance in urban China became apparent. Thus, in 1998, urban employee health insurance was officially launched (Chinese State Council, 1998). In addition to employees of private and state-owned/collective companies, the plan is extending coverage to urban employees of government and non-profit organizations. Both employers and employees are required to contribute approximately 6 percent and 2 percent, respectively, of employees' annual wages to the plan. Urban employee health insurance is administered at the city level.

Table 1 provides a brief summary of three health insurance plans in terms of initiating year, administration level, insured population, premium contributions, annual maximum reimbursement cap, and inpatient/outpatient coverage.

Although some form of health insurance is available to most every Chinese resident, as Table 1 indicates, the three major health insurance plans differ substantially. Previous studies suggest that differences in health insurance play an important role in creating health disparities for other

nations (Hafner-Eaton, 1993; Krobot et al., 2004; Hadley, 2007; Sabik and Dahman, 2011). One concern is that individuals under the different health insurance plans in China may vary their health seeking behaviors, leading to disparities in health care utilization and expenditures.

As these three health insurance plans have been implemented fairly recently in China, there are no existing studies on comparing different effects on health seeking behaviors and costs. Instead, several previous studies have analyzed individual health insurance plans (Lei and Lin, 2009; Brown and Theoharides, 2009; Yi et al., 2009; Lin et al., 2009).

### **3. Data Sources**

#### **3.1 Data Source**

This study uses data from the China Health and Nutrition Survey (CHNS) 2009 maintained at the Carolina Population Center in the United States (The Carolina Population Center, 2011). The CHNS is an ongoing international collaborative project between the Carolina Population Center in the USA and the National Institute of Nutrition and Food Safety at the Chinese Center for Disease Control and Prevention. The CHNS covers 9 provinces (Heilongjiang, Liaoning, Jiangsu, Shandong, Henan, Hubei, Hunan, Guangxi, and Guizhou) in China that differ substantially in terms of economic development, public resources, and health care indicators. These nine provinces were selected to capture a wide range of socioeconomic and urban-rural characteristics. Mainland China has 32 provinces or province-equivalent administrative regions, and the 9 provinces included in the CHNS covered approximately 45% of Chinese population in 2009. The CHNS 2009 includes 10,078 respondents aged 18 and above. After omitting those with missing values in health insurance, health utilization, and health expenditure variables, our final sample includes 9,329 adult respondents aged 18 and above.

#### **3.2 Measures**

##### **3.2.1 Health Care Utilization Measures**

Each adult in the CHNS 2009 was asked “During the past 4 weeks, did you receive any preventive health care services, such as health examination, eye examination, blood test, blood pressure screening, tumor screening?” A binary variable indicating whether preventive health care services were received in the past 4 weeks is created as the first health utilization variable. Each adult in the CHNS 2009 is also asked “During the past 4 weeks, have you been sick/injured? Have you suffered from a chronic or acute disease?” If the answer to the above question is yes, the respondent is further asked “What did you do when you felt illness?” The second health utilization variable measures whether the respondent saw a doctor. A binary variable indicating whether a respondent sees a doctor when ill is created for the subsample of respondents who reported having an illness during the past 4 weeks. 2,046 respondents answer “yes” to this illness question and make up this subsample. No other health utilization and expenditure variables are available for the entire study sample in CHNS data.

### **3.2.2 Health Expenditure Measures**

If the respondent saw a doctor for illness during the past 4 weeks, he or she was asked to report total health expenditures for this treatment. Then the respondent was queried as to what percentage of these health expenditures had been paid or might be paid by insurance if he or she had health insurance.

### **3.2.3 Health Insurance Measures**

Each adult in the CHNS 2009 is asked whether he or she has health insurance at the survey time. If the answer is yes, he or she is asked whether the health insurance plan is the rural newly cooperative medical scheme, the urban resident health insurance, or the urban employee-based health insurance. Urban-employee-based health insurance also includes formal government (free) health insurance. Approximately 3 percent of respondents under commercial health insurance or other health insurance plans are excluded from this study due to their diverse medical coverage and small sample sizes. Three binary variables are created to represent each health insurance plan with the rural newly cooperative medical scheme as the reference group (the most common health insurance plan). We also add a binary variable indicating no health insurance in the bivariate and multivariate analyses to capture the roughly 10% of Chinese population that still lacks any health insurance coverage (the various reasons why this group lacks health insurance are discussed below).

### **3.2.4 Other Explanatory Variables**

In addition to binary variables indicating the type of health insurance plans the respondent has, if any, the multivariate analysis controls for a variety of sociodemographic factors, health indicators, and regional variables that could independently affect health care utilization and expenditures. Specifically, the models control for the following explanatory variables: gender, age, race minority, marital status, highest education level, province where the respondent resides with Heilongjiang as the reference province, a binary variable indicating whether the respondent lives in a rural or urban area, an urbanization index, a binary variable that indicates whether the respondent has previously been diagnosed with a chronic and/or acute disease (hypertension, diabetes, myocardial infarction, apoplexy, and/or asthma), a binary variable indicating whether the respondent is currently a student, a binary variable indicating employment status, and a series of binary indicators of occupation types if employed, with farming (self employed) as the reference occupation. The models also control for household income (in Chinese Yuan) in natural logarithms and household size.

## **3.3 Statistical and Econometric Analyses**

We employ bivariate and multivariate methods in the empirical analyses. First, we compare health care utilization and expenditures among people with different health insurance plans using

the Chi-square test for binary variables and the Student's t test for continuous variables. Due to the binary nature of the health care utilization measures (e.g., receiving preventive health care services or seeing a doctor for illness), we employ logistic regression. The total health care expenditures and reimbursement percentages are continuous measures, so ordinary least squared (OLS) estimation is employed. The total health expenditure variable is transformed using a natural logarithm, to help normalize its distribution (Mullahy, 1998).

#### 4. Empirical Results

Table 2 shows descriptive statistics for our study sample. In 2009, 8,427 (90.33%) respondents in the study sample had one of three major health insurance plans. The majority of our study sample is insured by the rural newly cooperative medical scheme (5,419 respondents, 58.09% of the study sample). 902 respondents do not have any health insurance coverage. Urban resident health insurance and urban employee-based health insurance account for 933 respondents (11.01% of the study sample) and 2,075 respondents (24.01% of the study sample), respectively. The Chi-square test is used for binary health utilization variables and the Student's t test is used for continuous health expenditure variables to compare the descriptive statistics among various health insurance plans (including no health insurance). We find that respondents with urban resident health insurance and urban employee-based health insurance are more likely to receive preventive health care services ( $p$  values  $< 0.01$ ). Seeing a doctor for illness is quite similar for all three health insurance plans, and even respondents without health insurance are just as likely to see a doctor when ill. In contrast, we find that total health expenditures in Chinese Yuan and reimbursement percentages for urban employee-based health insurance are substantially higher than those for the other two health insurance types and that these differences are statistically significant.

Table 3 describes reasons for having no health insurance. 20.62% report that they do not need health insurance because they are healthy, 11.09% indicate that it is not worth having because insurance reimburses only small portion of total medical costs, 27.27% cannot afford health insurance due to high insurance premiums, 38.03% report other reasons that are not further delineated from the data, and 3% do not answer this question.

We report odds ratios (OR) from the logistic regressions for preventive health services and the probability of seeing a doctor when ill. Consistent with the results of the bivariate analyses, Table 4 shows that respondents with urban employee-based health insurance are significantly more likely to receive preventive health services than those with the rural newly cooperative medical scheme (odds ratio = 1.64; 95% CI: 1.03, 2.60), but urban resident health insurance is not statistically significant (odds ratio = 1.20; 95% CI: 0.71, 2.05) any more. Respondents without health insurance have the lowest likelihood of receiving preventive health services (odds

ratio = 0.60; 95% CI: 0.32, 1.12). However, we do not find any disparities in terms of seeing a doctor when a respondent feels ill (odds ratios are close to 1 for different health insurance plans and not statistically significant).

Table 5 shows the results of multivariate analyses for total health expenditures and reimbursement percentages. We do not find any evidence of disparities in terms of total health expenditures after controlling for the other explanatory variables. Even though urban employee-based health insurance has 30% higher medical expenditures compared to the rural newly cooperative medical scheme, this difference is not statistically significant. However respondents with urban employee-based health insurance receive 26.68% (95% CI: 17.49, 35.87) greater reimbursements from their insurance than respondents with the other two health insurance types.

## 5. Summary and Conclusions

We find substantial disparities in terms of receiving preventive health care services for the different health insurance types, but no evidence supports the existence of disparities when people need to see a doctor for illness. One potential explanation is that the rural newly cooperative medical scheme and urban resident health insurance may not cover all the basic outpatient services and/or annual physical exams, which often include preventive health care services. Health insurance plan is unrelated to total medical expenditures, but urban employee-based health insurance is significantly more generous. This disparity in reimbursement percentage may reflect more comprehensive benefits packages in urban employee-based health insurance, in contrast to the high deductibles/copayments and low maximum reimbursement caps for the rural newly cooperative medical plan and urban resident health insurance.

The rural newly cooperative medical scheme generally does not reimburse expensive outpatient services for chronic conditions;<sup>7</sup> indeed, the reimbursement rate was as low as 11-15% in its early years.<sup>12</sup> Compared to those without the rural newly cooperative medical scheme in rural China, the rural newly cooperative medical scheme did not increase total medical expenditures and/or out-of-pocket medical expenditures (Wagstaff et al., 2009; Babiarz et al., 2010).

This study has some limitations. First, the CHNS data only cover 9 provinces in China, which may not be representative of the general population in China. However, there are at present no national data available to study all three health insurance plans in China yet. Second, health care utilization and expenditures were reported during the past 4 weeks, and there were no measures available in the CHNS data for a longer period, such as one year before the survey time. These long-term measures may better reflect health utilization and expenditures. However, recall bias may be greater for health care utilization and expenditures reported over longer time horizons, particularly in rural China as respondents may not be well educated. Third, the rural newly cooperative medical scheme and urban resident health insurance have only been implemented

recently, and it may take some time for people to fully understand the details of their new health insurance coverage.

Preventive health services have been shown to enhance health and reduce future medical expenditures (Fries et al., 1993; Cohen et al., 2008; Monheit, 2010), so providing more preventive health services to people with the rural newly cooperative medical scheme and urban resident health insurance are policy changes that warrant serious consideration. Such changes may eventually reduce the utilization of inpatient services and total health care costs.

At the same time, extending health insurance coverage may have limited success if reimbursement rates remain low. Moreover, there are substantial regional variations in coverage and reimbursement rates across different regions in China, and these coverage decisions are made at the local rather than the central government level. Thus, important variations in access to care may persist within each health care system. These observations suggest that, even if the disparities we document are reduced or eliminated, inadequate access may persist for many insured patients in China in the absence of more generous coverage and given variations in coverage rates within each of these three health insurance plans. Understanding this issue is an important direction for further research.

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## Endnotes

\* Corresponding author: Hai Fang, PhD, MPH, Professor, China Center for Health Development Studies, Peking University, 38 Xueyuan Road, PO Box 505, Haidian District, Beijing, 100191, China; Telephone: +86 10 82805702; Fax: +86 10 82805695; E-mail: hfang@hsc.pku.edu.cn.

Qingyue Meng, PhD, Professor, China Center for Health Development Studies, Peking University, China.

John A Rizzo, PhD, Professor, Department of Economics and Department of Preventive Medicine, State University of New York at Stony Brook, USA.

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Table 1: A Summary of Three Major Health Insurance Plans in China

	Health insurance schemes		
	Rural newly cooperative medical scheme	Urban resident health insurance	Urban employee-based health insurance
Initiating year	2003	2007	1998
Administration level	county	city	city
Insured population	rural residents	urban non-employed residents	urban employed residents
Insured population number (2011)	830 million	430 million	
Annual premium contributions (2011)			
Government	200 Chinese Yuan	200 Chinese Yuan	none
Individual	varied by locations	varied by locations	2% of wages
Employer	none	none	at least 6% of wages
Annual maximum reimbursement cap (2011)	at least 50000 Chinese Yuan	6 times of disposable personal income (at least 50000 Chinese Yuan)	6 times of disposable personal income (at least 50000 Chinese Yuan)
Inpatient and outpatient services for catastrophic illness	Yes	Yes	Yes
General outpatient services	Limited and varied by locations	Limited and varied by locations	Comprehensive

References: Chinese State Council (1998); Chinese Ministry of Health (2003); Chinese State Council (2007); Chinese Central People's Government (2011); Chinese Ministry of Health (2011).

**Table 2: Descriptive Statistics**

Variables	All sample		Rural newly cooperative medical scheme		Urban employee-based health insurance		urban resident health insurance		No health insurance		P value <sup>1</sup>
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Sample size	9329		5419		933		2075		902		
Health utilizations and expenditures (during the past 4 weeks)											
Preventive health services	0.04	0.19	0.03	0.16	0.05	0.21	0.06	0.24	0.02	0.14	<0.01
See a doctor for illness	0.44	0.50	0.46	0.50	0.45	0.50	0.40	0.49	0.47	0.50	0.17
Medical expenditure (Chinese Yuan)	1661	5892	1356	5728	1270	4141	2839	7641	1141	2530	0.02
Reimbursement percentage	22	33	16	27	20	31	46	40	N/A		<0.01
Province											<0.01
Heilongjiang	0.10	0.31	0.11	0.32	0.07	0.25	0.10	0.30	0.09	0.29	
Liaoning	0.10	0.30	0.08	0.28	0.08	0.27	0.16	0.36	0.12	0.32	
Jiangsu	0.12	0.32	0.09	0.28	0.15	0.36	0.18	0.38	0.11	0.32	
Shandong	0.11	0.31	0.11	0.31	0.14	0.35	0.12	0.33	0.07	0.25	
Henan	0.12	0.33	0.14	0.35	0.15	0.35	0.07	0.26	0.09	0.28	
Hubei	0.10	0.30	0.10	0.30	0.07	0.25	0.11	0.31	0.07	0.26	
Hunan	0.11	0.31	0.10	0.31	0.11	0.32	0.10	0.30	0.12	0.33	
Guangxi	0.14	0.34	0.14	0.35	0.14	0.35	0.08	0.27	0.25	0.43	
Guizhou	0.11	0.31	0.12	0.33	0.10	0.30	0.08	0.27	0.08	0.27	
Other confounding variables											
Chronic/acute diseases diagnosed	0.15	0.36	0.12	0.32	0.19	0.39	0.24	0.43	0.15	0.35	<0.01
Male	0.48	0.50	0.47	0.50	0.41	0.49	0.55	0.50	0.46	0.50	<0.01
Age	50	16	49	15	52	16	53	15	47	18	<0.01
Race minority	0.13	0.33	0.16	0.37	0.07	0.25	0.08	0.27	0.11	0.31	<0.01
Married	0.83	0.37	0.85	0.36	0.80	0.40	0.85	0.36	0.72	0.45	<0.01
Highest education levels											<0.01
Less than primary school degree	0.23	0.42	0.30	0.46	0.21	0.41	0.09	0.28	0.20	0.40	
Primary school degree	0.19	0.39	0.24	0.43	0.17	0.38	0.09	0.29	0.16	0.37	
Junior high school degree	0.33	0.47	0.37	0.48	0.32	0.47	0.25	0.43	0.33	0.47	

Senior high school degree	0.12	0.32	0.07	0.26	0.18	0.39	0.19	0.39	0.16	0.37	
Technical or professional degree	0.07	0.26	0.02	0.14	0.07	0.26	0.20	0.40	0.08	0.27	
College degree	0.05	0.22	0.00	0.07	0.04	0.20	0.18	0.38	0.06	0.24	
Currently being a student	0.02	0.15	0.02	0.15	0.03	0.17	0.02	0.13	0.03	0.17	0.04
Currently be working	0.59	0.49	0.68	0.47	0.38	0.49	0.52	0.50	0.47	0.50	<0.01
Occupations if currently be working											<0.01
Farmer	0.28	0.45	0.46	0.50	0.04	0.20	0.01	0.07	0.10	0.30	
Professional worker	0.05	0.21	0.01	0.11	0.02	0.14	0.16	0.37	0.03	0.16	
Administrator/executive/manager	0.02	0.15	0.01	0.10	0.01	0.11	0.06	0.25	0.01	0.09	
Office staff	0.05	0.21	0.03	0.16	0.05	0.21	0.09	0.29	0.05	0.22	
Regular worker	0.17	0.37	0.15	0.35	0.23	0.42	0.17	0.38	0.23	0.42	
Other occupations	0.03	0.17	0.03	0.16	0.04	0.18	0.03	0.16	0.05	0.22	
Household income (Chinese Yuan, in natural log)	10.0	1.5	9.9	1.5	10.0	1.5	10.5	1.1	9.7	1.9	<0.01
Household size	3.73	1.66	3.99	1.73	3.47	1.52	3.14	1.33	3.83	1.69	<0.01
Urban	0.31	0.46	0.07	0.25	0.68	0.47	0.69	0.46	0.50	0.50	<0.01
Urbanization index	67	19	56	14	82	13	85	13	76	18	<0.01

Date source: China Health and Nutrition Survey 2009

N/A: not applicable.

<sup>1</sup> P values are based on Chi-Square tests for categorical variables and Student's t tests for continuous variables across 4 health insurance plans.

**Table 3: Reasons for Having No Health Insurance**

	Frequency	Percent
No health insurance (reasons)		
I do not need health insurance because I am healthy	186	20.62 %
It is not worth because insurance reimburses only small amount of total medical costs	100	11.09 %
The premium is too high for me to afford	246	27.27 %
Other reasons for no health insurance	343	38.03 %
Reasons not reported	27	2.99 %
Total	902	100.00 %

**Table 4: Logistic Regressions on Health Utilization**

Variables	Preventive health services		See a doctor for illness	
	OR	95% CI	OR	95% CI
<b>Health insurance types</b>				
Rural newly cooperative medical scheme (reference)				
Urban resident health insurance	1.20	( 0.71 , 2.05 )	0.95	( 0.67 , 1.34 )
Urban employee-based health insurance	1.64**	( 1.03 , 2.60 )	0.97	( 0.64 , 1.45 )
No health insurance	0.60	( 0.32 , 1.12 )	1.02	( 0.70 , 1.50 )
<b>Province</b>				
Heilongjiang (reference)				
Liaoning	3.61**	( 1.14 , 11.49 )	1.40	( 0.69 , 2.84 )
Jiangsu	9.70***	( 3.00 , 31.38 )	3.48***	( 1.86 , 6.51 )
Shandong	6.99***	( 2.09 , 23.30 )	3.19***	( 1.46 , 6.94 )
Henan	6.71***	( 2.16 , 20.79 )	3.75***	( 2.03 , 6.94 )
Hubei	6.01***	( 1.65 , 21.88 )	3.87***	( 1.98 , 7.56 )
Hunan	6.84***	( 2.00 , 23.38 )	2.92***	( 1.48 , 5.78 )
Guangxi	11.04***	( 3.22 , 37.81 )	5.08***	( 2.80 , 9.22 )
Guizhou	3.09*	( 0.88 , 10.78 )	3.96***	( 2.02 , 7.76 )
<b>Other confounding variables</b>				
Chronic/acute diseases diagnosed	2.71***	( 2.02 , 3.63 )	1.37***	( 1.12 , 1.67 )
Male	0.84	( 0.66 , 1.07 )	1.14	( 0.94 , 1.37 )
Age	1.00	( 0.99 , 1.01 )	1.00	( 0.99 , 1.01 )
Race minority	1.04	( 0.64 , 1.67 )	0.99	( 0.69 , 1.43 )
Married	1.11	( 0.81 , 1.53 )	1.24**	( 1.00 , 1.54 )
<b>Highest education levels</b>				
Less than primary school degree (reference)				
Primary school degree	1.12	( 0.69 , 1.80 )	0.84	( 0.63 , 1.12 )
Junior high school degree	1.08	( 0.69 , 1.69 )	0.90	( 0.65 , 1.23 )
Senior high school degree	1.07	( 0.65 , 1.74 )	1.02	( 0.67 , 1.56 )
Technical or professional degree	1.01	( 0.54 , 1.89 )	0.65*	( 0.40 , 1.03 )
College degree	0.87	( 0.39 , 1.92 )	0.66	( 0.31 , 1.36 )
Currently being a student	0.97	( 0.43 , 2.21 )	0.87	( 0.46 , 1.65 )
Currently be working	0.64*	( 0.40 , 1.04 )	0.86	( 0.64 , 1.15 )
Occupations if currently be working				

Farmer (reference)			
Professional worker	1.79	( 0.79 , 4.04 )	0.44* ( 0.19 , 1.05 )
Administrator, executive, or manager	1.96	( 0.86 , 4.45 )	1.06 ( 0.48 , 2.36 )
Office staff	1.89**	( 1.01 , 3.54 )	0.88 ( 0.48 , 1.59 )
Regular worker	1.36	( 0.73 , 2.53 )	1.21 ( 0.84 , 1.76 )
Other occupations	1.66	( 0.77 , 3.58 )	0.89 ( 0.48 , 1.67 )
Household income (Chinese Yuan, in natural log)	1.18***	( 1.05 , 1.33 )	0.97 ( 0.89 , 1.06 )
Household size	0.87***	( 0.79 , 0.97 )	1.03 ( 0.95 , 1.11 )
Urban	0.67*	( 0.42 , 1.06 )	1.14 ( 0.76 , 1.71 )
Urbanization index	1.00	( 0.99 , 1.02 )	1.00 ( 0.99 , 1.01 )

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\*statistically significant at the 10% level; \*\*statistically significant at the 5% level; \*\*\*statistically significant at the 1% level.



**Table 5: Ordinary Least Squares Regression on Health Expenditure and Reimbursement**

Variables	Medical expenditure (natural logarithm)		Reimbursement percentage	
	Coff.	95% CI	Coff.	95% CI
Health insurance types				
Rural newly cooperative medical scheme (reference)	-			
Urban resident health insurance	0.005	( -0.73 , 0.72 )	4.12	( -4.98 , 13.22 )
Urban employee-based health insurance	0.30	( -0.37 , 0.97 )	26.68***	( 17.49 , 35.87 )
No health insurance	0.06	( -0.51 , 0.64 )	N/A	
Province				
Heilongjiang (reference)				
Liaoning	-0.88**	( -1.73 , -0.04 )	-23.10***	( 40.88 , -5.32 )
Jiangsu	-1.76***	( -2.60 , -0.91 )	-14.93	( 32.91 , 3.05 )
Shandong	-0.78	( -1.74 , 0.18 )	8.52	( 14.06 , 31.10 )
Henan	-1.55***	( -2.23 , -0.86 )	-27.65***	( 44.96 , -10.34 )
Hubei	-0.97***	( -1.84 , -0.09 )	-5.80	( 27.90 , 16.30 )
Hunan	-2.01***	( -3.11 , -0.90 )	-14.09	( 32.28 , 4.10 )
Guangxi	-1.47	( -2.17 , -0.78 )	-26.63***	( 43.62 , -9.65 )
Guizhou	-1.39	( -2.14 , -0.64 )	3.18	( 17.42 , 23.79 )
Other confounding variables				
Chronic/acute diseases diagnosed	0.28	( -0.07 , 0.64 )	5.76**	( 0.58 , 10.95 )
Male	-0.09	( -0.42 , 0.25 )	2.26	( -1.99 , 6.52 )
Age	0.00	( -0.01 , 0.01 )	0.03	( -0.15 , 0.21 )
Race minority	0.65**	( 0.14 , 1.15 )	13.01***	( 5.68 , 20.34 )
Married	0.41	( 0.01 , 0.81 )	9.44***	( 4.37 , 14.51 )
Highest education levels				
Less than primary school degree (reference)				

Primary school degree	-0.03	( -0.52 , 0.45 )	3.45	( -3.11 , 10.01 )
Junior high school degree	-0.03	( -0.51 , 0.46 )	-1.61	( -7.72 , 4.50 )
Senior high school degree	-0.13	( -0.80 , 0.54 )	6.54	( -4.12 , 17.20 )
Technical or professional degree	0.43	( -0.44 , 1.30 )	3.47	( 10.16 , 17.10 )
College degree	-0.68	( -2.01 , 0.64 )	0.91	( 24.29 , 26.10 )
Currently being a student	-0.0002	( -1.29 , 1.29 )	6.48	( -7.51 , 20.47 )
Currently be working	-0.52***	( -0.93 , -0.12 )	-4.46	( 10.27 , 1.36 )
Occupations if currently be working				
Farmer (reference)				
Professional worker	-0.05	( -1.01 , 0.90 )	-16.24	( 36.59 , 4.11 )
Administrator, executive, or manager	0.17	( -1.49 , 1.82 )	-7.51	( 32.95 , 17.93 )
Office staff	0.18	( -0.63 , 0.99 )	-7.20	( 26.39 , 11.99 )
Regular worker	0.30	( -0.24 , 0.83 )	0.60	( -6.36 , 7.56 )
Other occupations	0.85**	( 0.08 , 1.62 )	2.40	( -6.09 , 10.90 )
Household income (Chinese Yuan, in natural log)	0.04	( -0.10 , 0.17 )	-0.32	( -2.30 , 1.66 )
Household size	-0.12**	( -0.23 , -0.02 )	0.22	( -1.15 , 1.59 )
Urban	-0.04	( -0.68 , 0.59 )	5.62	( -3.56 , 14.80 )
Urbanization index	0.01	( -0.01 , 0.02 )	-0.19*	( -0.39 , 0.01 )
Constant	6.07***	( 4.03 , 8.10 )	31.75**	( 2.81 , 60.70 )

\*statistically significant at the 10% level; \*\*statistically significant at the 5% level; \*\*\*statistically significant at the 1% level.