

Summary (3/4)

- Actual living arrangement of the aged
 - In recent years, more than half of the aged population co-resided with their children, only few (less than 5%) resided in institutions.
 - However, the elders aged 80 or above are more likely to reside in institutions, as compared to the younger elder groups.
- Ideal living arrangement of the aged
 - The most preferred living arrangement for the elders is co-residing with children.
 - The proportion of the elders who preferred institutions has even declined over time.



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Summary (4/4)

- In the past ten year, most elders relied on financial transfers from children as the main source of living expenses. However, the proportion has declined over time.
- As the elders became older, they relied more and more on subsidies from the government, while own income, savings and assets became less and less important.

As fertility declines, the government has to build a stronger and comfortable social security network for the aged population.



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Thank you for your listening!

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International Seminar on “Comparative Study on Population Aging in Eastern Asian Low Fertility Countries”

Population Aging and Public Health Insurance Reform in Rural China

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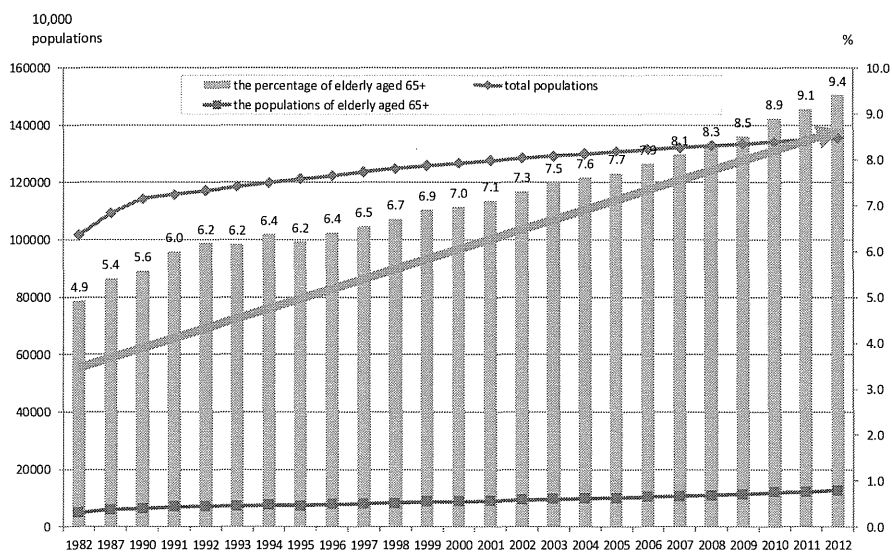
1. Introduction

- Population Aging is progressing in rural China (Fig.1).
 - One-child policy (Fig.2)
 - Migration from the rural districts to the urban districts (Fig.3)

- Although during the planned economy period (1949~1977), the **Cooperative Medical System** (CMS:农村合作医疗制度) was established in the rural districts, it was collapsed in the 80s along with the economic reform (Fig.4).

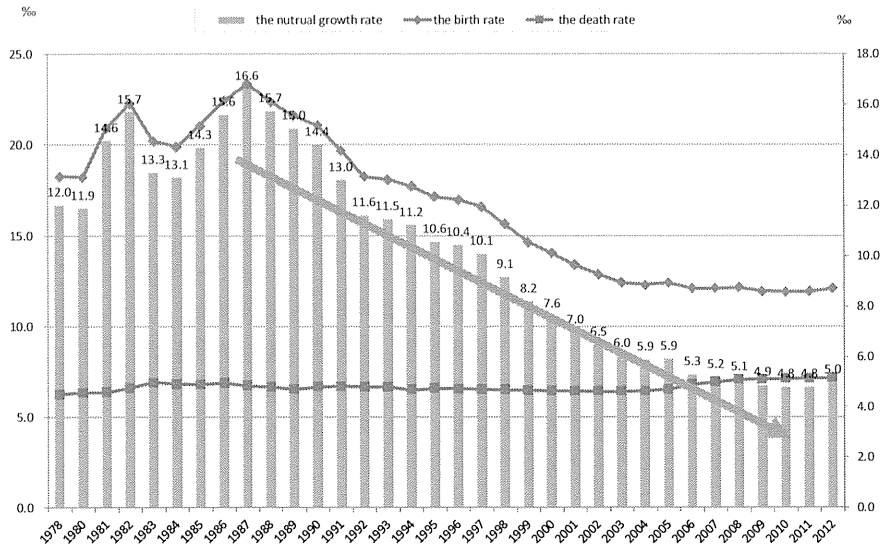
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Fig.1 Trends of the Percentage of Elderly Aged 65+



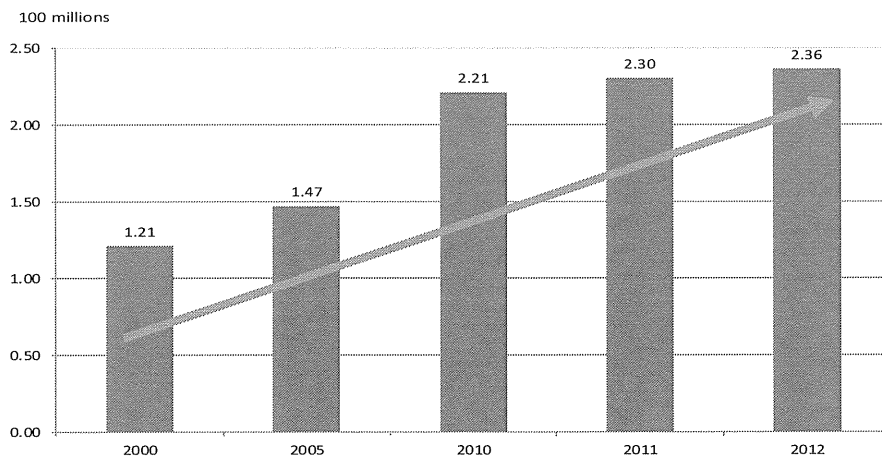
Sources: NBS (2013) *China Statistic Yearbook 2013*.

Fig.2 Trends of the Population Birth Rate in China



Sources: NBS (2013) China Statistic Yearbook 2013.

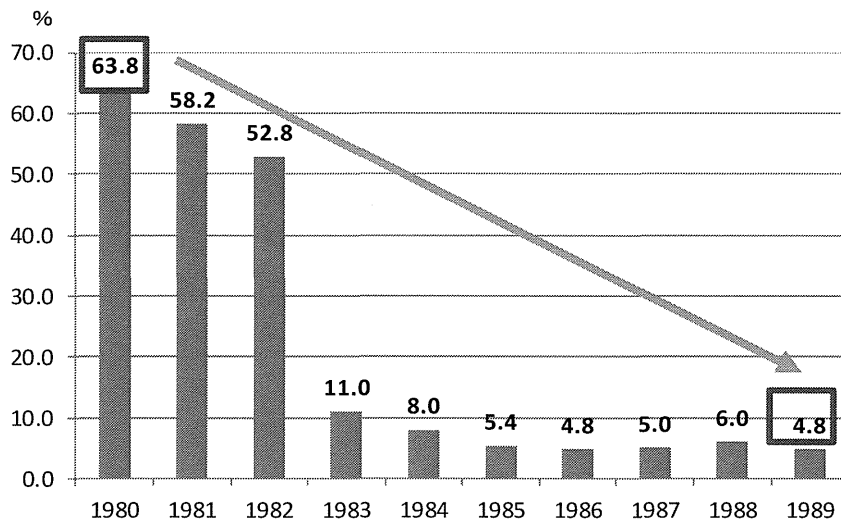
Fig.3 Trends of the Migrants in China



sources: Chinese population census.

Migrants: Those who move from the rural district to the urban district and work as the employer or the self-employed in the urban district with the rural registration.

Fig.4 Participation Rate of the Rural Cooperative Medical System(CMS)



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1. Introduction

- After 1990s, as it was said as “看病难,看病贵” (“To receive the health care service is so difficult, and the health care expenditure is so high”), the probability of the rural residents becoming the poor when illness was very high, and health care inequality was a serious social problem in China.
- The public health insurance (“The New Cooperative Medical Scheme :NCMS”新农村合作医疗制度) was established in 2003.

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Research Question:

Does the NCMS affect the utilization of health care service and out-of-pocket of health care expenditure (医療費の自己負担、医疗费自负) in the rural China?

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2. The Reform of Public Health Insurance in Rural China (from CMS to NCMS)

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Cooperative Medical System (CMS)

● Establishment

- Cooperative health care clinic was established in Shanxi (山西) province in 1953.
- In 1956, the establishment of cooperatives was allowed to be performed in the whole rural districts by the National People's Congress.

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● CMS and the people's commune

- CMS was promoted with the development of the people's commune, which was the final administration organization of Chinese Communist Party in the rural districts after 1959.
- CMS was a mutual aid and cooperation association. Main financial resources were based on the fee charged by the rural residents and the people's commune (the collective organization).

Note: The registration system (*Hukou Zhidu*) was enforced after 1958.

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● Evaluation of CMS

- United Nations stated as “The CMS in China is responsible for primary health care in the rural and enhance the health care quantity, it is one of the paradigm for the developing country.” (in *Women and Children's Fund Association's 1980 and 1981 report*)
- World Bank and WHO (World Health Organization) also praised that "China has achieved great success by controlling the mortality of infectious diseases. The result was much larger than many other developing countries", “CMS in the rural China is the only paradigm that can solve the health care expenditure problem in developing countries, and it is a successful health care revolution .” (World Bank, 1994).

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New Cooperative Medical Scheme (NCMS)

● Establishment

- In the 1990s, while the decrease of the participation in CMS , health care expenditure increased greatly and quickly.
- The probability that the rural residents with severe disease become the poor was very high, health care inequality was a serious social problem in China.

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- In March 1993, Chinese Ministry of Health proclaimed the universal health insurance planning.

- In January 1997, the State Council published “Decisions about Health Care Reform and Health Care Development”, and announced “We will conduct a **New Cooperative Medical Scheme** (NCMS: 新村合作医疗制度) in the rural, and effort to disseminate the public health insurance in the rural by 2000”.

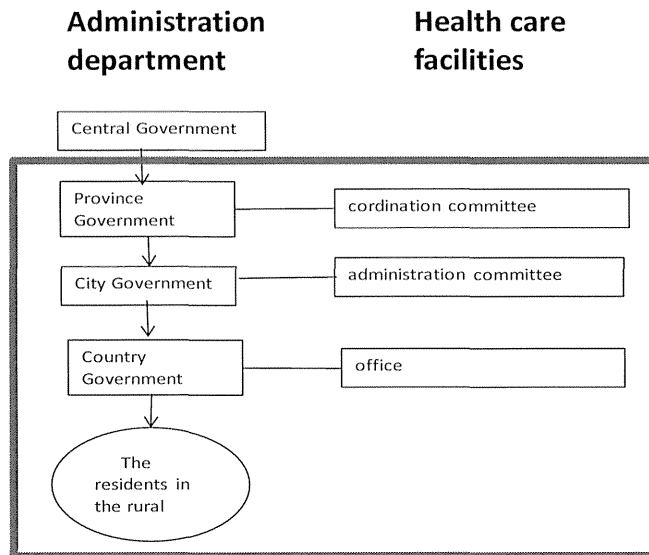
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- On January 10, 2003, Ministry of Health, Ministry of Finance and Ministry of Agriculture promulgated the “The Opinions on the Establishment of the New Rural Cooperative Medical Scheme”.

- After 2003, local government began to select at least 2-3 districts to perform NCMS as the project model. The successful cases were promoted in the other districts .

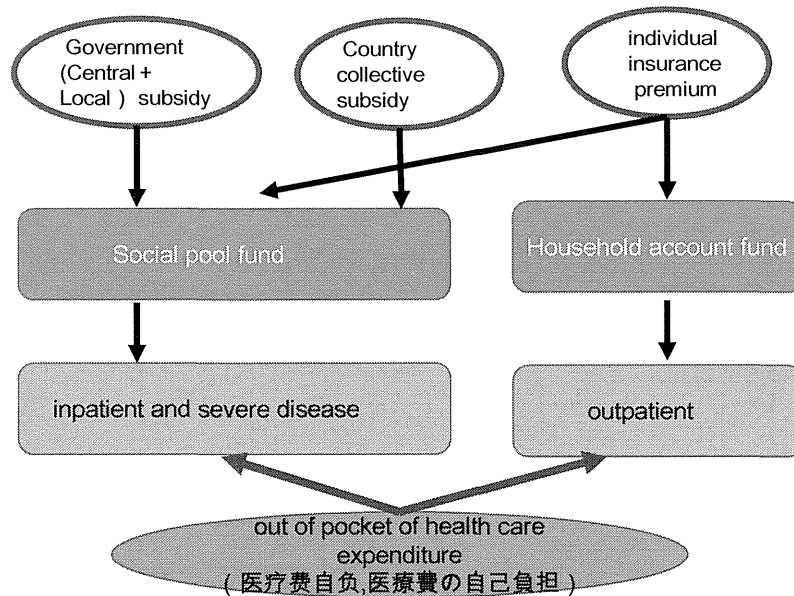
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● Management organization



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● Fund and Reimbursement



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3. Literature Review

1. Empirical studies using cross section data
Wagstaff *et al.*(2009), Shi *et al.*(2010), Xiao *et al.*(2010),
You and Kobayashi (2011), Lu *et al.*(2012) , Li *et al.* (2014)

2. Empirical studies using panel data
Wagstaff and Lindelow (2008), Lei and Lin(2009), Jing
et al. (2013), Cheng *et al.*(2014)

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Features of the study

1. Except of Lei and Lin (2009),Jing *et al.* (2013),
less analysis using DID (Difference in
Difference) analysis method.
 - Using the quasi- natural experiment case, the
effect of the NCMS can be estimated by the
DID analysis method.

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2. In empirical studies on the utilization of health care services, the Anderson model is used commonly (Anderson 1995; Anderson and Newman 1973).

- Although Lei and Lin (2009) and Jing *et al.*(2013) applied the DID method, they didn't used the Anderson model, so there exist the omitted variable problem in previous studies.



- DID method based on Anderson model is applied in this study.

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4. Methods

The models

Probit regression model (Random effect model)

$$y_{it}^* = \alpha_i + \beta_1 NCMS_{it} + \beta_2 X_{it} + u_i + v_{it} \quad (1.1)$$

$$y_{it}^* = \begin{cases} 1 & \text{if } y_{it}^* > 0 \\ 0 & \text{if } y_{it}^* \leq 0 \end{cases} \quad (1.2)$$

$$P(y_{it} = 1) = p_{it} = P(u_i + v_{it} = 1 - \alpha_i - \beta_1 NCMS_{it} - \beta_2 X_{it}) \quad (1.3)$$

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Quasi-experiment (DID)

$$y_{it}^* = \alpha_i + \gamma_1 Treatment_{it} + \gamma_2 Year_t + \gamma_3 DID_{it} + \gamma_4 X_{it} + \varepsilon_{it} \quad (2)$$

DID is a cross-item of treatment dummy and reform period dummy

	Pre-2003(before)	Post-2003(after)
estimation 1	2000	2004 or 2006
estimation 2	2000	2004
estimation 3	2000	2006

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Data: CHNS2000-2006

- CHNS is a panel survey conducted by North Carolina University. The first wave of survey was conducted in 1989. New Cooperative Medical Scheme (NCMS) was performed in 2003, so pre-reform period (wave2000) and post-reform period(wave2004 and wave2006) are used.
- Representative regions are covered in these survey. They are Jiangsu(江苏), Liaoning (辽宁), Helongjiang (黑龙江), Shandong (山东), Henan (河南), Hubei (湖北), Hunan (湖南), Guangxi (广西) and Guizhou (贵州) provinces (9 regions).
- Based on the resident ledger used in population census, the sample is extracted using a multi-stage random sampling methods.
- Sample sizes are 16,150(2000), 9,856(2004), 9,788(2006).

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Main Dependent Variables

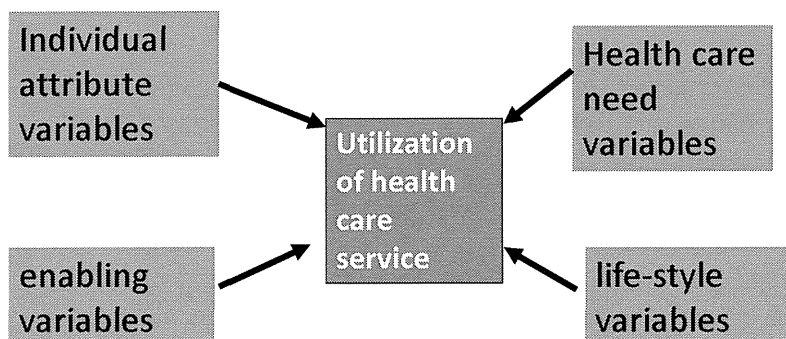
- Probability of receiving the health care service
Those who received the health care service within four weeks after illness =1, the others=0
- Out of pocket of health care expenditure (医療費の自己負担、医药费自负)
Out of pocket of health care expenditure
=health care expenditure X co-sharing rate
- Probability of disaster health care expenditure
Rate of health care expenditure to household income per capita is 40 % or more than 40%=1, less than 40%=0
- Probability of receiving physical examination
Those who received physical examination=1, the others=0

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Independent Variables

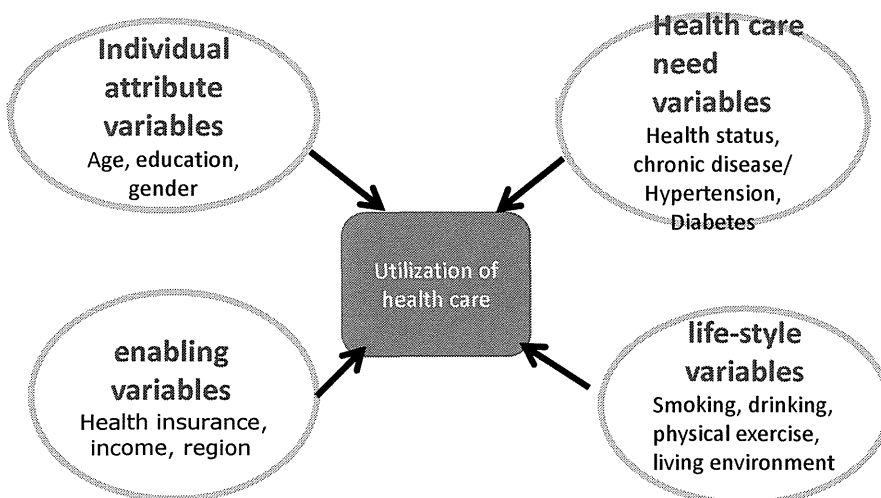
Anderson's model

(Anderson 1995; Anderson and Newman 1973)



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Independent Variables



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Table 1 Health Insurance Status in Rural China

	2000年			2004年			2006年		
	Total	age16-59	+age60	Total	age16-59	+age60	Total	age16-59	+age60
Civil servants medical	4.9%	5.1%	4.3%	0.5%	0.4%	0.8%	0.3%	0.2%	0.5%
BHIS	2.4%	2.5%	2.2%	0.5%	0.5%	0.6%	1.6%	1.6%	1.5%
CMS	4.5%	4.8%	3.5%	11.2%	11.2%	11.2%	43.0%	43.0%	43.1%
Private Health Insurance	1.8%	1.8%	1.8%	0.9%	1.1%	0.2%	0.7%	0.9%	0.1%
Family health Insurance	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%
Unification Insurance	0.5%	0.5%	0.3%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
The Others	1.0%	2.0%	1.8%	0.1%	0.1%	0.0%	0.3%	0.3%	0.3%
no-enrollment	83.9%	83.2%	86.0%	86.6%	86.4%	87.0%	54.1%	54.0%	54.5%

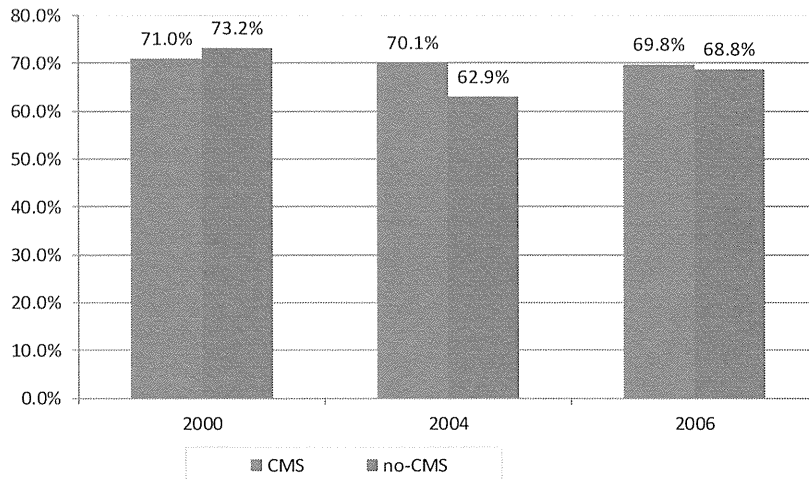
Source : calculated based on CHNS2000-2006.

Notes: BHIS: Basic Health Insurance Scheme for urban employees

CMS:Cooperative Medical Scheme for rural residents.

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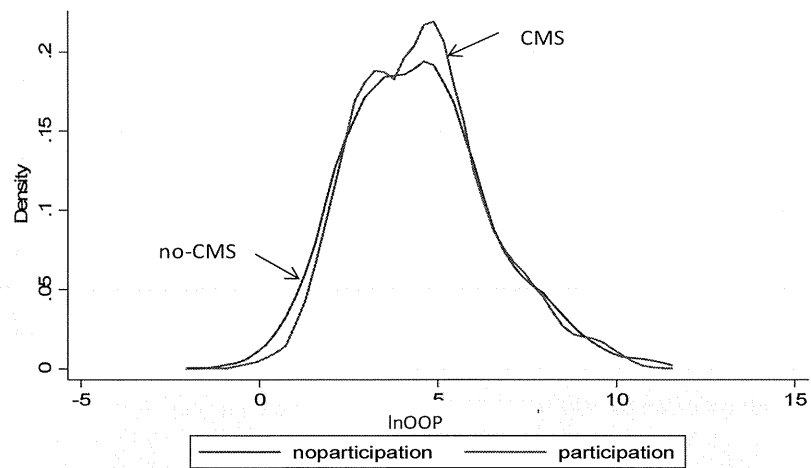
Figure 2 The Proportion of Groups Who Received Health Care Service When Illness



Source : CHNS2000-2006.

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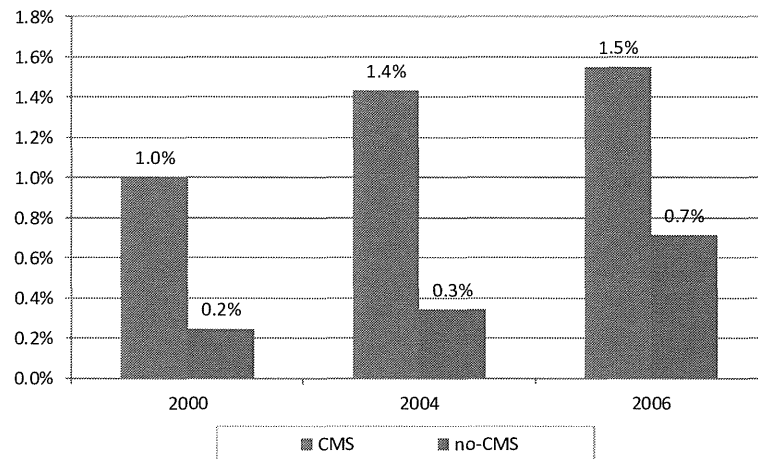
Figure 3 Kernel Density Distribution of Out of Pocket of Health Care Expenditure



Source : CHNS2000-2006.

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Figure 4 The Proportion of Groups Who Received Physical Examination



Source : CHNS2000-2006.

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5. Results

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Table 2 The Effect of NCMS in Rural China (1)

	2000vs.2004		2000vs.2006	
	margin effect	z-value	margin effect	z-value
(1)Access to health care service (outpatient and inpatient)				
Treatment	0.0420 **	2.42	0.0034	0.32
Year	0.0581 ***	8.35	0.0533 ***	6.15
DID	-0.0068	-0.41	0.0191	1.45
(2)Access to health care service (outpatient)				
Treatment	0.0380 **	2.25	0.0057	0.56
Year	0.0546 ***	8.10	0.0514 ***	6.15
DID	-0.0038	-0.23	0.0158	1.26
(3)Access to health care service (inpatient)				
Treatment	0.0020	0.71	-0.0015	-0.71
Year	0.0021 *	1.75	0.0012	0.68
DID	-0.0017	-0.84	0.0020	0.68

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Table 2 The Effect of NCMS in Rural China (2)

	2000vs.2004		2000vs.2006	
	margin effect	z-value	margin effect	z-value
(4) OOP of Health Expenditure				
Treatment	0.1794	0.35	-0.3708	-1.00
Year	-0.2820	-1.09	-0.6917 **	-2.12
DID	-0.8014	-1.42	0.1397	0.32
(5) Total Health Care Expenditure				
Treatment	-0.2570	-0.54	-0.4107	-1.24
Year	-0.2544	-1.10	-0.6899 **	-2.52
DID	-0.5156	-1.07	0.1347	0.37
(6) Disaster health care expenditure				
Treatment	-0.0373	-0.32	-0.0798	-0.80
Year	-0.2341 ***	-2.94	-0.4285 ***	-3.66
DID	-0.1340	-1.41	0.0537	0.45
(7) Physical examination				
Treatment	-0.0008	-0.40	-0.0036	-1.36
Year	0.0011	0.89	0.0018 **	1.23
DID	0.0071	1.25	0.0167 ***	2.68

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Main findings of table 2

1. In the results of ①probability of access to health care facilities, ②probability of outpatient, ③probability of inpatient, ④the total health care expenditure, ⑤out of pocket expenditure(OOP), ⑥probability to become the disaster health care expenditure, the estimated coefficient of DID term is not statistically significant.



NCMS hasn't significant effect on the reduction of OOP and the probability to become the poor if illness. It also hasn't much more helpful to increase the probability of access to health care facilities.

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Table 3 The Effect of NCMS in Rural China by Age Groups (1)

	+age60		age16-59	
	margin effect	z value	margin effect	z value
	2000vs. 2004			
(1)Access to health care service (outpatient and inpatient)				
Treatment	0. 0128	0. 19	0. 0441 **	2. 52
Year	0. 1016 ***	4. 33	0. 0498 ***	6. 96
DID	0. 0515	0. 65	-0. 0112	-0. 69
(2)Access to health care service (outpatient)				
Treatment	0. 0162	0. 25	0. 0367 **	2. 20
Year	0. 0925 ***	4. 07	0. 0477 ***	6. 97
DID	0. 0391	0. 53	-0. 0039	-0. 24
(3) OOP of Health Expenditure				
Treatment	-0. 5169	-0. 31	0. 3867	0. 69
Year	0. 1272	0. 18	-0. 3180	-1. 08
DID	1. 0163	0. 58	-1. 1695 *	-1. 66
(4) Total Health Care Expenditure				
Treatment	-0. 7749	-0. 51	-0. 2830	-0. 55
Year	0. 3780	0. 60	-0. 3488	-1. 35
DID	0. 2509	0. 16	-0. 5689	-1. 02
(5) Physical examination				
Treatment	-3. 00E-05	-0. 01	-0. 0006	-0. 26
Year	-3. 27E-08	-0. 22	0. 0004	0. 37
DID	0. 7627	0. 01	0. 0042	0. 88

- In working group (16-59age), compared to the no-NCMS group , OOP of health care expenditure 117% point lower for NCMS group.
- On the other hand, in the elderly group (age60+), the estimated coefficient of DID term is not statistically significant.

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