

**An Impact Evaluation of Access to Health Care
In Different Social Experiments of Rural China**
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There are two main different models-community-based health insurances in the western rural parts of China.: one is Rural Mutual Health Care (RMHC); the other is New Cooperative Medical System (NCMS). Two models have their own characteristics, but what are their effects for improving the farmers' access to health care services, to increase the utilization and decrease the health out-of-pockets for the members and non-members in the schemes. The study compared with two models for their impacts to promote health care access. The results show that RMHC had the better effect on increasing health utilization and decreasing health out-of-pocket expenditure than NCMS according to the sampling data in Zhen'an Shaanxi, China; furthermore we analyze the possible reasons to the results and finally put forward some suggestions on how to improve the health care access in western rural China.

Keywords: health insurance, access to health care, out-of-pocket, rural China

1. Introduction

China has entered a high-speed economic developing and social transition during the past over 25 year economic reform. The economic development provided the substantial basis for people's living condition improvement and health level enhancement. However, the economic development is imbalance among the regions, between rural areas and urban districts, which causes the imbalance of health care development, utilization of health care service among different population. More than 500 million rural residents lack adequate basic care and risk impoverishment if they become seriously ill in China (Wang et al 2005). According to the third national health survey, 45.8% rural residents did not seek outpatient service in the past two weeks, when they need to; 30.0% not for inpatient service in the past one-year. Especially in the poor households, 33.4% households become the poor were due to illness. Health expenditure increased obviously comparatively slowly increasing income for the most farmers. The average expenditure of visit doctor per time increased from 45RMB in 1998 to 78 RMB in 2003; average hospitalization fees did from 1532RMB to \$2236 per hospitalized time. The poorest group in china rural areas was 333RMB, but average health expenditure reached 89RMB, accounting for 27% total income (<http://gov.people.com.cn>), and very high economic burdens for the poorest people. Lacking an effective health care system hinder the people to access health care, for the poor in particular. "the poverty caused by illness and poverty due to illness" hinder the social development, becoming one of hottest problems which caused great attention from China government and society. Inequity access to the care affects the social stable and builds a harmonious society.

The main reason hindering farmers' access to health care is lacking in health care

system. In the 1960s-70s, China created an organized three-tiered health care supply system of village posts, township health centers and county hospitals, built the rural Cooperative Medical System (CMS), which mainly supplied prevention and medical treatment, covered most of rural population. It was praised by WHO and WB as the China Model-used minimum input, and gained maximum health benefits. Nevertheless, since the Reform in 1978, with the transition from the collective to the individual household land leasing and farming system, the CMS also collapsed (Hsiao 1984; Gu et al. 1993; Wang et al 2005). The second China National Health Service Survey showed that more than 87% of farmers did not have any health insurance coverage and paid out-of-pocket of health expenditure (Ministry of Health PRC 1999). In 1997, the Central Committee of the Communist Party of China and State Council issued "Decision of Health Reform and Development", which demonstrated that the guidelines of rural work in the new stage were focused on rural health care, and emphasized prevention." And "Strengthen rural health work, and realize the planning goal of primary health care." Consequently, the research and pilot experiments were carried out recover and rebuild CMS in China rural areas, but the result was not agreeable. In 2002, China government made out the decision of building the New Cooperative Medical System (NCMS) in rural areas according to the principles of Voluntary enrollment, multi financing, proceeding in the light of local conditions, directing according to different situation, publicity & transparency, and real benefiting the people. In 2003, the pilot experiments of NCMS were implemented in the selected counties, and gradually extend to. Up to June, 2005, 163 million rural residents participated NCMS. The goal of coverage rate will reach 60% in 2007, coverage all rural residents in 2010 (<http://www.moh.gov.cn/2.htm>).

The NCMS supplied fund 10RMB before 2005, 20RMB after that from Central Government and Local Government respectively. Farmers should pay 10RMB or more. The money paid by farmers goes into individual savings for outpatient service; the money from the government goes into a risk pooled funds, mainly for inpatient services. Deductible fees per admission are about 600-1200RMB, co-payment rate about 50-60%, ceiling fees about 20,000RMB. As to the management to supply side, DRGs payment has been implemented in some piloted counties, for example county Zhen'an, Shaanxi.

Rural China's medical problems also have drawn much attention to many scholars and organizations abroad. In 2003, senior professor William Hsiao at Harvard University with the project team started to a social experiment-Rural Mutual Health Care (RMHC) in western province Zhen'na, Shaanxi and Kai yang, Guizhou. The RMHC scheme mimicked the government contributions to RMHC; every scheme participant is given 20RMB, Enrollees each contribute 10 RMB as a premium; the impoverished farmers are covered by the government and plus the Drugs profits. The project was managed by

RMHC office. Three benefit packages designed could be selected, and had different co-payment rates for outpatients, no deductible fees for inpatient services and, ceiling fees 1200RMB –1800RMB in 2005. As the system innovation, RMHC scheme used competition to select and contract with the village doctors for the performance; their income came from the salary and bonus.

As we mentioned above, China economic development is imbalance in different regions, exist very big the gap between provinces; moreover, different regions have different cultures and custom etc. The established health care scheme should fit the local reality to increase access to the health care, to decrease farmers' disease risk and improve health level. Nowadays, there are two major health care schemes-RMHC and NCMS in the western part of China. The final goal is same to improve t people health, but two schemes have a big difference in the manage mechanism, financing and implementing etc. What were the main factors impacting farmers' decision to enroll the schemes? What were the determinate factors impacting the farmers' utilization of health care, including outpatient services and inpatient services? Also what were the levels of financial protection for the members versus nonmembers of the two schemes, especial for the vulnerable groups? The research on the problems, and analyses of caused reasons could help the health reform have more pertinence to have good effects.

The study evaluated the impact of Mutual Health Care Scheme (MHCS) with New Cooperative Medical Scheme (NCMS). in Shaanxi, China, and try to answer the questions: what main factors influence farmers' decision to enroll the schemes, the utilization of health care and financial protection for the members versus nonmembers?

According to the aim of research, we have two hypotheses: the first one is households, which have relative higher income, were more possible to enroll in, same situation to the group of poor health, and the household head with higher education; the other one is farmers who are members of the schemes used more health care service compared with those are not, and the schemes improve the access to health for the poor and sick people.

2. Methods and Data

2.1 Research methods

According to the objects and contents, we analyze from the three aspects to evaluate the access to health care in two models. They are the main factors impacting the farmers' participation, utilizations and medical out-of-pocket expenditures. A two-part model is used to evaluate the impact of the care access.

(1) Participation to the schemes

We used a binary logit model to estimate the probability of participation,

$$P_i = \beta_0 + \beta_1 I + \beta_2 H + \beta_3 Z + \beta_4 S + \beta_5 M + \varepsilon$$

Where variable I represents household income, H for characteristics of household head, Z for household characteristics, S for social and economy characteristics for different models, M for different schemes, and ε for error term.

If $P_i^* > 0$ $P_i = 1$, meaning the household is a member of the MHCS, $P_i = 0$ otherwise.

(2). Access to health care utilizations

To evaluate the impact of MHCS on financial protection of members between the participants and non-participants, two aspects have to be taken into account: the probability of visiting a health care provider, and the out-of-pocket expenditure borne by individuals.

A logistic regression is used to establish the predicated probability of participating the schemes, and the establish how related factors (Wang et al. 2005); Two-part model developed as part of the Rand Health Insurance Experiment in the United States (Duan et al. 1983; Manning et al. 1987; Cretin et al. 1990; Johannes P Jütting 2005; Wang et al. 2005) were used to assess the probability of utilizations including visiting doctor and hospitalization, and estimate the incurred level of out-of-pocket expenditures, conditioning on positive use of health care services: a logit model is used for utilization; log-linear model for health expenditure, of out-of-pocket, conditioning on positive use of health care services:

$$\text{Log}(\text{out-of-pocket expenditure}/\text{visit} > 0) = X\beta + S\alpha + v$$

Where X represents a set of independent variables that are hypothesized to affect the farmers patterns of utilization. S has the same meaning like mentioned above. v is a error term. We should consider whether farmers used health care or not, and a logit model is used to assess the probability of visiting a health provider.

$$\text{Prob}(\text{visit} > 0) = X\beta + S\alpha + \gamma$$

Where X stands as a vector for individual, households, social economy characteristics, S represents different schemes

2.3 Data collection

Zhen'an as one of fifties impoverished counties in China. Its area is 3487 square meter. The total population is 280,000, 250,000 as agriculture population. In 2005, GDP was 1.6 billion RMB; financial income was 25.3 million RMB. Average income of farmers was 1576 RMB. There are 25 townships and 205 administrative villages. In 2003, Zhen'an was confirmed as the initial pilot experiments of New Cooperative Medical System (NCMS). At the same time, the project of Rural Mutual Health Care Scheme (RMHC) directed professor William Hsiao with his team was carried out in the township Tiechang, Zhangjia. For this study, we choose Tiechang and Gaofeng, both two as the pilot townships in Zhen'an, carried out the schemes RMHC and NCMS; participation rate to the schemes were 65.1% and 77.0% in 2005 respectively.

Data collected from the household survey conducted in the Tiechang and Gaofeng

townships, located in China's Shaanxi province in November 2005. . The multistage stratified random sampling was used in the survey. In the first stage, considering the geographic and economic situation, four villages were randomly selected; then households were chose in term of the proportion of the numbers of sampling households accounting for the total households. The total number of households and interviewees were 1219 (570 in Tiechang, 649 in Gaofeng) and 4802 (2332 in Tiechang, 2470 in Gaofeng) respectively. The survey includes the income, socio-demographic characteristics, health status, one month and a 1-year recall period used for outpatient and inpatient care and out-of-pocket expenditure as well..

3.Results

3.1 Variable descriptions

According to the goal, variables from the individual and household characteristics are included. The main interest of research is to compare the two different schemes in access to health care in term of different income group and health status. Supposed members of the schemes have better access and low burden for health care than nonmember in the scheme, and one scheme may have more positive impacts to farmers then the other; also community effects are taken into account due to specific design of the two schemes, for example, RMHC design considered changing the behavior of village doctors; and NCMS for implementing DRGs partly, which all influences health services for both members and non members of schemes.

Income is the most important variable in the research, one of the research questions is income and its effect on the decision to participate the schemes; we suppose the income has a positive influence on the decision to participate and the poorer strata of population will not participate for difficulties in paying the premium. In the model, the amount of non-medical consumption was used as a proxy for farmers' incomes, because it is difficult to obtain reliable income. Also the health status would influence the utilization rate and health expenditure; we suppose the people who had the poor health may more like to participate. We use a self-reported health measure health status, which are originally divided into five group-'excellent', 'very good', 'good', 'fair', and 'poor'; health status are divided into three group, and the first two groups were merged into one represented 'good', for 'good' representing medium status, the last two groups into one representing poor status. The variable description shows as follow table1.

Table 1 Description of variables

Individual and household Characteristics		Descriptions
Age group1		
Age21-45		1 if age between 21 and 40 years,0 if otherwise. Omitted group
Age61-90		Age between 61 and 90
Age group2		
Age1-14		1 if age between 1 and 24, 0 if otherwise.

Age15-60	1 if age between 15 and 60, 0 if otherwise, omitted group
Age>60	1 if age>60 years old, 0 if otherwise
Education (dummy)	
Illiterate*	Illiterate and age≥6.Omitted group
Elementary	1 if elementary school,1-6 years if otherwise
Junior high and above	1 if primary school, 7-9 years and above, 0 if otherwise
Sex (Male)	1 if male, 0 if otherwise
Married status	
Unmarried*	1 Unmarried, omitted group
Married	1 Married, 0 if otherwise
Widow or Widower	1 Widow or Widower, 0 if otherwise
Remarried	1 Remarried, 0 if otherwise
Divorced	1 Divorced, 0 if otherwise
Cohabitant or Separated	1 cohabitant/separated/other, 0 if otherwise
or other	
Income	
Low income	Total expenditure(net of medical expenditure) is in the 0-25% percentile. Omitted group
Medium income	1 if total expenditure(net of medical expenditure) is in the 26-75% percentile, 0 if otherwise
High income	1 if total expenditure(net of medical expenditure) is in the 76-100% percentile, 0 if otherwise
Illness-ratio	Number of illness cases per household in the last month
Hospitalized days	Stayed days in hospital
Distance (km)	
D-village	Mean distance from home to village Health post
D-township	Mean distance from home to township hospital
D-County	Mean distance from home to county hospital
Schemes	
S-MHCS	1 if members belong to RMHC, 0 if otherwise.
S-NCMS	1 if members belong to NCMS, 0 if otherwise.
Community	
C-TC	1 if households belong to Tiechang, 0 if otherwise.
C-GF	1 if households belong to Gaofeng, 0 if otherwise.
Classified as poor	1 if household classified as poor

Still in the analyses, we defined the RMHC as model1, NCMS as model2; we considered the scheme factors, we further defined the model_TC1 for RMHC without adding variable scheme, model1_TC2 adding to that variable. It is the same way for Gaofeng as mode2_GF1, and model_GF2. Besides, we also took into account the community factors, and added variables C_TC and C_ZJ.

3.2 Determinants of participation in the schemes

Table 2 shows the two models are highly significant and their explanatory power is

good. The two models have the differences in some aspects. The results of model1 suggest that the poorer group is less likely to enroll a rural mutual health care system than the group with medium and high income, 36% and 42% points high separately; poor household defined by the local government is represented to a lesser extent than non poor households to participate to RMHC; the families with higher ill ratio are more possible to participants the scheme; also household heads who have elementary education are more likely to attend. The model2 is similar with some aspects such as the farmers who belong to medium income are more like to enroll the NCMS; also the same result for the family with higher ill ratio. Generally speaking, the same results for the two models are mainly that poor farmers are less likely to attend the scheme, and the families with higher illness ratio have higher possible for the enrolment.

Also as the models show that development of community-based health insurance schemes depend on many factors, besides income and ill ratio, still related to married status and distance with the facilities.

Table2 Determinants of Participation in the Schemes

Variable	Model1(RMHC_TC)	Model2(NCMS_GF)
Male	-0.6673(0.8749)	0.0092(0.1015)
Married	0.3287(0.9417)***	-0.2815(0.1119)**
Remarried	0.3874(0.2387)*	0.7674(0.7662)
Divorced	-1.0367(0.8526)	0.0860(1.1729)
Widow/Widower	0.4352(0.2574)**	0.2144(0.2945)
Elementary (Education1)	0.2409(0.8889)***	0.1168(0.2782)
Children(Edu00)	0.3766(0.2410)	-0.2027(0.2782)
Poor Household	-0.6991(0.1386)***	-0.1248(0.3970)
Medium Health	-0.8441(0.8773)	-0.1377(0.1027)
D-Village	-0.006(0.001)	-0.0190(0.0082)**
D_Twonship	0.000(0.01)*	-0.0783(0.0085)***
D_County	0.0007(0.011)	-0.0022(0.0047)
Ill ratio	0.7141(0.1447)***	0.5475(0.2479)**
Age61-90	-0.1214(0.1412)	-0.1469(0.1634)
Medium Income	0.3617(0.1052)***	0.4835(0.1252)***
High Income	0.4189(0.1104)***	0.1837(0.1210)

Sources: Own estimation Based on the survey data

Standard errors in the parentheses.

*Significant at the 0.1 level;** Significant at the 0.05 level;*** Significant at the 0.01 level

3.3 Health care utilization in different schemes

Marginal coefficients for access to health care are analyzed from three points of views – from total utilization (outpatients' and inpatients aspects), outpatient use and inpatient use.

(1) Predicate influence factors of total utilization

Table3 Determinants of used any Health Facilities

Variable	Model1	Model1	Model2	Model2
	(RMHC_TC1)	(RMHC_TC2)	(RMHC_GF1)	(RMHC_GF2)
Male	-0.0026(0.1272)	0.0086(0.1282)	-0.1599(0.1942)	-0.1608(0.1492)
Married	0.6382(0.1879)***	0.5594(0.1907)***	0.5463(0.2345)**	0.5478(0.2348)**
Remarried	1.4343(0.3039)***	1.3649(0.3962)***	0.4122(0.8179)	0.4100(0.8181)
Widow/Widower	0.7649(0.3335)**	0.6672(0.3372)**	0.4610(0.3880)	0.4615(0.3880)
Elementary(Edu1)	-0.1388(0.1320)	-0.1663(0.1328)	0.0653(0.1569)	0.0651(0.1569)
Children(Edu00)	0.4850(0.3860)	0.5021(0.3876)	0.5390(0.3915)	0.5390(0.3915)
Poor Household	0.0969(0.2055)	0.1821(0.2086)	-0.1932(0.6380)	-0.1948(0.6383)
Medium Health	0.0701(0.1271)	0.0769(0.1279)	0.2268(0.1513)	0.2270(0.1513)
D-Village	-0.0023(0.0032)	-0.0021(0.0032)	0.0014(0.0053)	0.0014(0.0054)
D_Twonship	-0.0024(0.0022)	-0.0026(0.0021)	-0.0042(0.0092)	-0.0044(0.0094)
D_County	-0.0069(0.0033)**	-0.0079(0.0033)**	0.0094(0.0068)	0.0094(0.0068)
Chronic	2.1264(0.1380)***	2.1180(0.1390)***	2.2956(0.1670)***	2.2939(0.0068)***
Agep1-14	0.4903(0.2575)*	0.3886(0.2604)	0.9354(0.2961)***	0.9364(0.2962)
Agep>60	0.6129(0.1842)	0.0929(0.1857)	0.0760(0.2203)	0.0769(0.2205)
S_rmhc_tc/S_ncms	-	0.6430(0.1452)***	-	0.0246(0.1835)
Medium Income	0.4277(0.1643)***	0.3714(0.1655)**	0.3328(0.1818)*	0.3212(0.1822)*
High Income	0.7213(0.1658)***	0.6566(0.1667)***	0.3157(0.1864)*	0.3160(0.1864)*

Sources: Own estimation Based on the survey data. p=1, individual has visited doctor in the last month or used hospitalization care in the last year

Standard errors in the parentheses.

*Significant at the 0.1 level.

** Significant at the 0.05 level.

*** Significant at the 0.01 level.

Two models have been estimated for each dependent. As mentioned above, we focused on comparing the schemes, so add variables S_rmh or S_ncms, if they are 1, which means the farmers who participates one schemes (RMHC or NCMS). We expect the group who are the member of the schemes, could utilize more health facilities and pay low out-of-pocket expenditures.

From the table 3, we could know the farmers who have medium and high income have more utilization in medical care compared with poor farmers'. Also people who have chronic diseases maybe use more health care. The most important result is that the membership who participated RMHCe has a strong positive effect on the probability of visiting doctors or going to a hospital, the magnitude is quite high, with high probability of 64% points, statistical significance. On the contrast, NCMS shows positive effect, but not statistically meaningful. In addition, distances to the health facilities and married status also influence utilization.

According to the different characteristics of two models, one is reimbursement for outpatient and inpatient and the other is mainly for inpatients, so we further analyze the

utilization of them respectively.

(2) Predicate influence factors of the outpatient utilization (Dependent variable: whether farmers use outpatient service (at least one time)).

Table4 shows that the farmers with medium and high income used more outpatient services; age between 1-14 years old used more service compared with age 14-60; moreover, the members with chronic disease, married status and distance between the farmers home to health facilities also affected the utilization in RMHC. The farmers who are the member of RMHC have a positive effect to utilization, which shows significant meaning in statistics. RMHC raised the farmers using health facilities.

As to NCMS, main factors that influence the outpatient use are the members who had chronic disease, age, distances and married status and sex etc. Women used more outpatients compared with the men; people with other married status used more outpatient service compared with unmarried people. But for the members who were NCMS had a negative affect, although the result has no statistical meaning.

Table4 Any Use of Health Facilities(Outpatients)

Variable	Model1 (RMHC_TC1)	Model1 (RMHC_TC2)	Model1 (NCMS_FG1)	Model1 (NCMS_GF2)
Male	0.0334(0.1314)	0.0451(0.1322)	-0.2685(0.1623)*	-0.2669(0.1624)*
Married	0.6392(0.1977)***	0.5647(0.2006)***	0.5443(0.2587)**	0.5416(0.2588)**
Remarried	1.5844(0.3087)***	1.5209(0.3108)***	0.7157(0.6251)	0.7197(0.8251)
Widow/Widower	0.8880(0.1362)***	0.7974(0.3425)**	0.4697(0.4129)	0.4689(0.4129)
Elementary(Edu1)	-0.1514(0.1362)	-0.1765(0.1369)	0.1205(0.1690)	0.1207(0.1690)
Children(Edu00)	0.4017(0.3984)	0.4180(0.3997)	0.8348(0.4400)	0.8347(0.4400)*
Poor Household	0.3447(0.2135)	0.1114(0.2162)	0.0681(0.6388)	0.0714(0.6386)
Medium Health	0.0734(0.1309)	0.0796(0.1316)	0.1104(0.1650)	0.1100(0.1651)
D-Village	-0.0022(0.0033)	-0.0020(0.0033)	0.0043(0.0057)	0.0042(0.0053)
D_Twonship	-0.0022(0.0021)	-0.0023(0.0021)	-0.0082(0.0106)	-0.0076(0.0108)
D_County	-0.0064(0.0034)*	-0.0073(0.0034)**	0.0160(0.0075)**	0.0160(0.0075)**
Chronic Disease	2.1356(0.1422)***	2.1249(0.1431)***	2.1664(0.1774)***	2.1698(0.1781)***
Agep1-14	0.6074(0.2656)**	0.5123(0.2686)*	0.6089(0.3419)*	0.6069(0.3420)*
Agep15-60	0.1008(0.1873)	0.1310(0.1886)	0.1845(0.2292)	0.1825(0.2293)
S_rmhc_tc/ S_rmhc_gf	-	0.6048(0.1496)***	-	-0.0469(0.1963)
Medium Income	0.3876(0.1695)**	0.3323(0.1706)*	0.1840(0.1933)	0.1872(0.1937)
High Income	0.6982(0.1705)***	0.6356(0.1706)***	0.0676(0.2029)	0.0668(0.2029)

Sources: Own estimation Based on the survey data.

Standard errors in the parentheses.

*Significant at the 0.1 levels.

** Significant at the 0.05 levels.

*** Significant at the 0.01 levels.

(3) Predicate influence factors of the inpatient utilization

The dependent variable is whether farmers use inpatient service (at least one day). For the hospital utilization, the poor households used more than other households; farmers with chronic diseases also used more services; furthermore high-income group had more use hospital service in RMHC. Compared to the RMHC, the factors affecting the hospital utilization in NCMS are mainly people with chronic disease, age between 1 to 14 years old and people medium and high income had more use. The result implies existing the adverse selection in both schemes.

Table5 Any Use of Health Facilities(Inpatients)

Variable	Model1 (RMHC_TC1)	Model1 (RMHC_TC2)	Model1 (NCMS_GF1)	Model1 (NCMS_GF2)
Male	-0.2783(0.2983)	-0.2716(0.2990)	0.1889(0.2786)	0.1809(0.2786)
Married	0.6253(0.4855)	0.5518(0.4917)	0.4544(0.4687)	0.4683(0.4707)
Remarried	-0.2652(1.1139)	-0.3260(1.1163)	--	-
WW	-0.8440(1.1453)	-0.9145(1.1497)	0.0836(0.7757)	0.0795(0.7779)
Elementary (Edu1)	0.1951(0.3027)	0.1745(0.3035)	0.0753(0.2928)	0.0814(0.2925)
Children (Edu00)	0.0628(1.1535)	0.0622(1.1541)	-0.2543(0.8055)	-0.2571(0.8060)
Poor Household	0.8429(0.4034)**	0.8759(0.4045)**	0.1593(1.0519)	0.1381(1.0541)
Medium Health	-0.4871(0.3138)	-0.4831(3142)	0.4635(0.2789)	0.4698(0.2790)*
D-Village	-0.0435(0.0632)	-0.478(0.0644)	0.0068(0.0065)	0.0074(0.0066)
D_Township	-0.0248(0.0168).	-0.0252(0.0168)	0.0086(0.0159)	-0.0107(0.0163)
D_County	-0.040(0.0079)	-0.0039(0.0079)	-0.0167(0.0122)	-0.01635(0.0121)
Chronic	1.9323(0.3249)***	1.9045(0.3261)***	2.3482(0.3145)***	2.3367(0.3150)***
Agep1	0.3571(0.6757)	0.2620(0.6811)	14223(0.5488)**	1.4332(0.5496)***
Agep3	0.0024(0.4055)	0.0186(0.4075)	0.3729(0.3850)	0.3860(0.3855)
S_rmhc_tc /S_rmhc_gf	-	0.4407(0.3476)	-	-0.2803(0.3684)
Medium Income	0.5095(0.4139)	0.4571(0.4149)	1.0084(0.3881)***	0.9907(0.3887)**
High Income	0.8041(0.4124)**	0.7404(0.4139)*	1.2765(0.3811)***	1.2818(0.3816)***

Sources: Own estimation Based on the survey data.

Standard errors in the parentheses.

*Significant at the 0.1 levels.

** Significant at the 0.05 levels.

*** Significant at the 0.01 levels

3.4 Estimate the incurred level of out-of-pocket expenditure of outpatients

The schemes should supply the protection for the people who could afford to use health facilities, and to pay health expenditure, and decrease the health out-of-pocket expenditure, especially for the poor. We also analyzed from the three aspects: total fees of out-of-pockets includes any use of health facilities (outpatient and inpatient); outpatient fees and inpatient fees.

(1) Total health expenditure

Table 6 shows the total out-of-pocket of health expenditure. We could see the affecting

factors are different in the two schemes. The main factors are age and the scheme in RMHC; people whose age were 1 to 14 years old use less expenditure, age great than 60 using more compared with age 15-60 groups; also people who were in the RMHC spent less out-of-pockets fees compared with those who were not in the scheme. As to the scheme NCMS, main factors were some different. People with chronic diseases and high-income groups could spend more fees; people who live near from the health facilities would spend less out-of-pockets expenditure. But the people of the members of NCMS did not shows statistically significant meaning on decreasing the care fees.

Table6 Total health expenditure (outpatient and inpatients)

Variable	Model1 (RMHC_1_TC1)	Model1 (RMHC_1_TC2)	Model2 (NCMS-GF1)	Model2 (NCMS_GF2)
Male	-0.0675(0.1652)	-0.0719(-0.1639)	0.3215(0.2020)	0.3384(0.2017)
Married	-0.3020(0.2736)	-0.2706(0.2719)	0.0997(0.3333)	0.0363(0.3352)
Remarried	-0.1275(0.3862)	-0.0429)	-1.5875(1.1008)	-1.5945(1.0978)
Divorced	1.2933(1.3842)	1.4211(0.3851)	-	
WW	-0.8254(0.4275)*	-0.7702(0.4250)	-0.1544(0.5675)	-0.2231(0.5679)
Elementary(Edu1)	0.1186(0.1728)	0.1482(0.1720)	0.1500(0.2117)	0.1650(0.2114)
Children (Edu00)	-0.2352(0.5555)	-0.3347(0.5530)	-0.9523(0.5471)*	-0.9251(0.5459)
Poor Household	0.1947(0.2542)	0.1912(0.2523)	0.2783(0.5792)	0.3508(0.5797)
Medium Health	-0.1396(0.1633)	-0.1678(0.1625)	-0.2130(0.1993)	-0.2283(0.1990)
D-Village	-0.0092(0.0066)	-0.0088(0.0066)	-0.0050(0.0061)	-0.0013(0.0061)
D_Township	-0.0025(0.0018)	-0.0024(0.0018)	-0.0137(0.1178)	0.0172(0.0120)
D_County	-0.0019(0.0043)	-0.0025(0.0043)	-0.0165(0.0091)*	-0.0161(0.0091)*
Chronic	0.2356(0.1741)	0.1816(0.1744)	0.5402(0.2171)**	0.5736(0.2177)***
Agep1-14	-0.6681(0.3843)*	-0.6180(0.3821)	-0.0700(0.4266)	-0.0720(0.4255)
Agep15-60	0.5829(0.2321)**	0.6081(0.2306)***	0.1903(0.2745)	0.1931(0.2738)
S_rmhc_tc /S_rmhc_gf	-	-0.4504(0.1994)**	0.3864(0.2413)	-0.3794(0.2573)
Medium Income	0.0839(0.2133)	0.1195(0.2123)	-	0.3904(0.2407)
High Income	0.2602(0.2116)	0.2819(0.2102)	0.7844(0.2424)***	0.7293(0.2446)***

Sources: Own estimation Based on the survey data.

Standard errors in the parentheses.

*Significant at the 0.1 levels.

** Significant at the 0.05 levels.

*** Significant at the 0.01 levels

(2) Health out-of-pocket expenditure for outpatients

Compared with hospitalized services, people visiting doctor are more often. As to the model RMHC, farmers whose age were between 1 to 14 years old used less fees; spent more when their ages were over 60. Also people who were the member of For the farmers in NCMS, the medium and high-income group spent more fees compared with the poor group; people with medium health had fewer fees than those with the poor health; furthermore, people with chronic disease spent more money on outpatient expenditure. But it did not show statistically significant meaning to decrease the fees

for the people who participated the NCMS. The result could be seen table 7.

Table7 Outpatient health expenditure

Variable	Model1 (RMHC_TC1)	Model1 (RMHC_TC2)	Model2 (NCMS_GF1)	Model2 (NCMS_GF2)
Male	-0.1075(0.1623)	-1217(0.1612)	0.1837(0.2354)	0.1882(0.2362)
Married	-0.363(0.2735)	-0.0081(0.2718)	-0.2484(0.4060)	-0.2662(0.4086)
Remarried	0.1148(0.3720)	0.1889(0.3707)	-1.6488(1.1707)	-1.6452(1.1732)
WW	-0.4867(0.4165)	-0.4435(0.4139)	-0.7062(0.6553)	-0.7390(0.6603)
Elementary(Edu1)	0.2693(0.1707)	0.2907(0.1697)*	0.1555(0.2444)	0.1569(0.2449)
Children(Edu00)	0.0105(0.5502)	-0.1013(0.5485)	-0.7631(0.6335)	-0.7552(0.6351)
Poor Household	0.1867(0.2548)	0.1819(0.2529)	0.1266(0.6115)	0.1577(0.6350)
Medium Health	-1277(0.1607)	-0.1446(0.1597)	-0.4010(0.2295)*	-0.4022(0.2300)*
D-Village	-0.0089(0.0062)	-0.0085(0.0062)	0.0003(0.0066)	-0.0001(.0066)
D_Twonship	-0.0014(0.0017)	-0.0013(0.0017)	0.0111(0.0135)	0.0125(0.0138)
D_County	-0.0030(0.0042)	-0.0036(0.0042)	-0.0181(0.0109)*	-0.0177(0.0109)
Chronic	0.1598(0.1700)	0.0997(0.1709)	0.5249(0.2469)**	0.5406(0.2497)**
Agep1-14	-0.7202(0.3754)*	-0.6754(0.3732)*	-0.3030(0.5400)	-0.2966(0.5414)
Agep>60	0.5164(0.2275)**	0.5453(0.2262)**	0.2612(0.3065)	0.2602(0.3071)
S_rmhc_tc /S_rmhc_gf	-	-0.4266(0.1961)**	-	-0.1416(0.2964)
Medium Income	0.0416(0.2088)	0.0782(0.2079)	0.5168(0.2725)*	0.5169(0.2731)*
High Income	0.1398(0.2051)	0.1546(0.2037)	1.0226(0.2861)***	1.0026(0.2897)***

Sources: Own estimation Based on the survey data.

Standard errors in the parentheses.

*Significant at the 0.1 levels.

** Significant at the 0.05 level.

*** Significant at the 0.01 level

(3) Out-of-pocket for inpatients

For the inpatient fees, the main factor affecting hospitalized fees is the hospitalized days in both models. For the financial protection to decrease the economic burden, they did not show the function we expected, even in the NCMS with mainly for hospital reimbursements. In the NCMS, people with high income had more money to spent on health care utilization than low group did.

Table8 Inpatient health expenditure

Variable	Model1 (RMHC_TC1) ¹	Model1 (RMHC_TC2) ²	Model2 (NCMS_GF1) ³	Mode2 (NCMS_GF2) ⁴
Hospitalized Days	0.0484(0.0225)**	0.0482(0.0225)**	0.0100(0.0028)***	0.0098(0.0029)***
Male	-0.5705(0.4103)	-0.4336(0.4134)	0.2533(0.2639)	0.1928(0.2767)
Married	0.2714(0.7766)	0.3079(0.7604)	0.7363(0.4554)	0.7622(0.4591)
Divorced	2.6312(1.4280)*	2.6109(1.3975)*	-	-
WW	-2.7368(1.5501)*	-2.5070(1.5259)	0.5676(0.7715)	0.4782(0.7843)
Edu1	-0.6757(0.4055)	-0.6872(0.3969)*	-0.2030(0.3060)	-0.2624(0.3171)

Edu00	-0.9733(1.4344)	-0.5885(1.4307)	-0.3133(0.9708)	-0.3776(0.9795)
Poor Household	-0.2039(0.5548)	-0.1395(0.5449)	-1.6608(1.0165)	-1.6505(1.0220)
Medium Health	0.1116(0.4423)	0.0384(0.4364)	-0.2337(0.2740)	-0.1668(0.2888)
D-Village	0.1325(0.1621)	0.1254(0.1578)	-0.1031(0.0966)	-0.0016(0.0978)
D_Township	-0.0101(0.0186)	-0.0199(0.2849)	-0.0016(0.0186)	-0.0043(0.0191)
D_County	0.0098(0.0186)	0.0130(0.184)	0.0109(0.0117)	0.0105(0.0118)
Chronic	0.1770(0.5060)	-0.2524(0.4981)	0.3331(0.3113)	0.3835(0.3197)
Agep1	1.0489(0.9784)	0.8878(0.9644)	0.5482(0.4836)	0.5896(0.4891)
Agep3	-0.1127(0.6667)	0.0233(0.6597)	0.0185(0.3911)	0.0323(0.3936)
S_rmhc_tc /S_rmhc_gf	-	-0.6531(0.4700)	-	0.2822(0.3653)
Medium Income	0.8784(0.6318)	0.9215(0.6190)	0.2521(0.3357)	0.2614(0.3377)
High Income	0.8648(0.6319)	0.9853(0.6243)	0.6475(0.3506)*	0.6902(0.3568)*

Sources: Own estimation Based on the survey data.

Standard errors in the parentheses.

*Significant at the 0.1 levels.

** Significant at the 0.05 levels.

*** Significant at the 0.01 levels

4. Estimate the use and out-of-pockets expenditure with community factors

Considering the community role to promote better access to health care, we supposed that the townships which implemented the health care schemes helped to supply better health services and control costs, so inhabitants who were not the members of schemes could also be benefit from the schemes. In this part, we analyzed the utilization and fees plus the community variable, expressed them in C_tc and C_gf.

As we did above, we also analyze from the utilization and expenditure respectively, and add the community variable, what factors affect the health care use and expenditure.

4.1 Estimate the utilization considering the community factor

From the table9, we could know influencing factors to total utilization (visiting doctors and hospitalizations) were mainly income status, age, married status, and inhabitants who had chronic diseases, and the inhabitants who were the member of RMHC or not. The medium-income and high-income groups used more the facilities compared with those who had low-income group.

As to the utilization of outpatients, we could get similar results as total utilization; also shows community factor played the role to improve access to health care in RMHC, the result shows statistical significance; the main reasons were the scheme of RMHC were implemented in the community, which brought many changes, for instance, strengthening the surveillance of the doctors behaviors, some schilling for the village doctors, changed the payment way to village doctors (mentioned before) etc. in RMHC. Community variable C-GF was dropped out when the regression, shows no meaningful result.

For the utilization of inpatient, the main factors were the poor households decided by the local government according to the family economic condition, usually government subsidized for the poor family. Besides, medium and high-income group still use more health care. But the important results are people who participated the schemes and belonged to any communities had no impacts to increase utilization rate.

Table9 Health care utilization in the two communities

Variable	Utilization for inpatient and outpatient	Utilization for outpatient	Utilization for inpatient and outpatient
Male	-0.0694(0.0966)	-0.0899(0.1016)	-0.025(0.2003)
Married	0.5447(0.1470)***	0.5423(0.1572)***	0.5482(0.3363)
Remarried	1.2667(0.2751)***	1.4154(0.2789)***	-0.5250(1.0582)
WW	0.5697(0.2520)**	0.6397(0.2604)**	-0.2012(0.6262)
Elementary (Edu1)	-0.0694(0.1007)	-0.056(0.1056)	0.1162(0.2064)
Children (Edu00)	0.5252(0.2761)*	0.5968(0.2955)**	-0.1326(0.6564)
Poor Household	0.1181(0.1946)	0.0628(0.2019)	0.8294(0.3631)**
Medium Health	0.1151(0.0968)	0.0692(0.1019)	0.0349(0.2024)
D-Village	-0.0012(0.0025)	-0.0009(0.0025)	0.0037(0.0034)
D_Twonship	-0.0029(0.0023)	-0.0030(0.0024)	-0.0092(0.0088)
D_County	-0.0048(0.0028)*	-0.0036(0.0028)	-0.0100(0.0067)
Chronic diseases	2.1779(0.1061)***	2.1297(0.1105)***	2.0935(0.2242)***
Agep1-14	0.6172(0.1938)***	0.5399(0.2098)***	0.9583(0.4143)**
Agep>60	0.1113(0.1409)	0.1767(0.1444)	0.2019(0.2789)
S_rmhc_tc	0.6238(0.1441)***	0.5968(0.1482)***	0.3822(0.3425)
S_rmhc_gf	0.0156(0.1790)	-0.0684(0.1916)	0.2993(0.3609)
C_TC	-0.0962(0.2058)	0.0084(0.2158)**	-0.5474(0.4553)
Medium Income	0.3443(0.1214)***	0.2642(0.1268)**	0.7789(0.2782)***
High Income	0.5067(0.1230)***	0.4039(0.1287)***	1.0478(0.2768)***

Sources: Own estimation Based on the survey data.

Standard errors in the parentheses.

*Significant at the 0.1 levels.

** Significant at the 0.05 levels.

*** Significant at the 0.01 levels

4.1 Estimate the health expenditure considering the community factor

Considering the community factor, we analyzed again for the farmers' health care expenditure, see whether it is same like analyzing the utilization, two schemes or one of them could help to decrease the farmers' out-of-pocket, and increase financial accessibility.

The factors affecting total health expenditure were income, chronic diseases, age,

distances from the households to health facilities and whether the inhabitants participated the scheme or not. From the table 10, we could see that high-income group spent more expenditure compared with low-income group; the inhabitants who had the chronic diseases and whose age were over 60 spent more out-of-pocket expenditures on medical services. Especially the scheme of RMHC had the positive role to decrease the fees for the farmers.

When analyzing the expenditure of outpatients and inpatients respectively, we could see the influencing factors on outpatient service were almost same as total fees, but the primary factors in inpatient fees were hospitalized days, poor households, high income, the insurance scheme, and married status as well.

The patients who hospitalized longer paid more money; high-income group spent more compared with the poor group; The RMHC scheme still had the protection role to people who were the members of the scheme. But inhabitants who belonged to the community of Tiechang in which the RMHC was carried out spent more compared with the people who were not the members of the community. Maybe it existed the risk shift from members to non-members. People who were from the poor households spent less, and the poor people had less money and took less treatment, discharge early from hospital, even they were not healed. The non-outpatient rate for the farmers in the past two weeks were 35.8%, 21.13% and 9.6%, 21.3% to non-inpatient rate in past year in the survey 2005, respectively.

The scheme of NCMS could not reduce the farmers' health out-of-pocket unexpectedly. The possible reasons were that the NCMS in township Gaofeng mainly compensated the farmers' hospitalizations and the inpatient rate was not high, only about 3%, benefiting a few people; moreover had the relatively high deduct payment & high co-payment etc.

Table 10 Health care expenditure in two communities

Variable	Total fees	(Outpatient fees	Inpatient fees
Hospitalized days	-	-	0.0121(0.0029)***
Male	0.1052(0.1262)	0.0200(0.1347)	-0.1286(0.2176)
Married	-0.2220(0.2104)	-0.1931(0.2300)	0.5259(0.3811)
Remarried	-0.0775(0.3570)	0.0019(0.3640)	2.2058(1.1036)**
Divorced	1.4145(1.4245)	-	2.6949(1.0852)**
WW	-0.5405(0.3399)	-0.5359(0.3566)	0.0728(0.6823)
Edu1	0.1476(0.1327)	0.2452(0.1406)*	-0.3046(0.2331)
Edu00	-0.6139(0.3839)	-0.3091(0.4117)	-0.1133(0.7914)
Poor Household	0.2654(0.2354)	0.2473(0.2468)	-0.7297(0.3764)*
Medium Health	-0.1566(0.1256)	-0.2212(0.1333)	-0.0589(0.2342)
D-Village	0.0003(0.0039)	-0.0001(0.0039)	0.0530(0.0812)
D_Twonship	-0.0014(0.0018)	-0.0005(0.0018)	-0.0167(0.0142)
D_County	-0.0069(0.0039)*	-0.0067(0.0041)	0.0144(0.0087)

Chronic	0.3356(0.1327)**	0.2758(0.1411)*	0.0816(0.2625)
Agep1	-0.4717(0.2800)*	-0.6599(0.3100)**	0.6303(0.4516)
Agep3	0.3817(0.1746)**	0.3715(0.1811)**	-0.2475(0.3281)
S_rmhc_tc	-0.4661(0.2076)**	-0.4298(0.2156)**	-0.8997(0.3889)*
S_rmhc_gf	-0.3137(0.2340)	-0.1001(0.2529)	0.3408(0.3869)
C-TC	-0.2704(0.2824)	0.0449(0.2997)	0.8608(0.4968)*
Medium Income	0.2670(0.1559)*	0.2916(0.1641)*	0.3493(0.2974)
High Income	0.4984(0.1578)***	0.5022(0.4777)***	0.7277(0.3022)**

Sources: Own estimation Based on the survey data.

Standard errors in the parentheses.

*Significant at the 0.1 levels.

** Significant at the 0.05 levels.

*** Significant at the 0.01 levels

5. Conclusions

The study analyzed the impacts of two community-based health insurance on the access to health care of the poor rural areas-one is township Tiechang, the others is township Gaofeng. The former was a pilot for RMHC; the later is for NCMS. The article compared the utilization and health expenditure between the two models.

In the poor area of the western part in China, most of people lacked the access to the health care of good quality. The introduced schemes makes some different to improve the accessibility. Low cost & high frequency events and the risk of hospitalization were compensated by RMHC; NCMS is mainly reimburse for the hospitalization, and it has a relative high deduct payment and high co-payment which tries to avoid moral harm and fund risk, but the result could result in the poor access, and high people out-of-pocket expenditure.

Community-based health insurance has a potential positive effect on the ability of households to smooth their consumption, on labor supply and labor supply and labor productivity and on the health status of the people insured (Jütting,2003).

5.2 Utilization

The analyses of utilization of health care in the different models showed the income effect on farmers' utilization. For both schemes, generally speaking, medium income and high-income people used more health facilities, benefited more from the schemes, even though paid the same premium. The main determinant factors affecting the utilization were income, chronic disease, distance between households and medical facilities as well. Two models showed the same factors, but the people being the member of RMHC were more likely to use outpatient and inpatient services.

Considering the community factor, the community Tiechang seems to promote the outpatient utilization, not showed statistical meaning on the total health care and

inpatient services.

The different results for two models are maybe due to different design of the scheme; in term of NCMS, mainly pay attention to the hospitalization, inpatient services.

5.3 Health expenditure

Compared with affecting factors of farmers' out-of-pocket expenditure, the results show the fees mainly were related to age, hospitalized days and the scheme of RMHC in township Tiechang; the farmers who were the member of RMHC paid less when they participated the scheme, so the RMHC had the positive effect to lower out-of-pocket expenditure, mainly decrease the outpatient expenditure, the results were significant.

Considering the community factor, the influences factors on the out-of-pocket health expenditure for the farmers in the two community-based health insurance are age, income levels, and the scheme etc., but community factor either shows no significance or negative meaning. At the one hand, the people who were the members of RMHC, the scheme had the protect the members to pay less money, when they need medical service; on the other hand, the people who belongs to the community Ticheng (implemented the RMHC), who were not the members, used more, then spent more money, which might means more economic burden on them.

To summarize, the analysis of the impact of the different models on access to health care has shown that as the members of RMHC, visit doctors more and paid less compared with non-members; the community Tichang had the positive role to promote the use of health service, but did not show lower out-of-pocket expenditure. For the members of NCMS, which maybe promoted the utilization of health services, lower the expenditures, but did not show statistic significance.

6 Policy implications

6.1 Government subsidy to the poor

Whatever RMHC or NCMS is, the determinant factor included the variable income. Medium- and high-income group enrolled more compared with the poor group. The households defined as the poor family had the less chances to participate the scheme. Although the premium is low, but for the poorest groups still could not afford, then could not benefit from the schemes. So the government should shift its subsidy to the poor rural areas, especially to that poorest group.

6.2 Reduce deduction fee and co-payment rates

The research found that the farmers with low income in both schemes use less health services compared with the medium- and high income. Because he poor farmers could not pay co-payment part, then limited their health care utilization. Especially farmers

in the poor group, even they were members of NCMS could not use the service, if they could not afford to pay deduction fee in NCMS. A low deduction fees and co-payment will help the poor to increase their use and reduce the financial burden from health out-of-pocket expenditure. To achieve the aim, several policies options could be choose (Hong Wang et al, 2005); also could be considered that community financing schemes link with social funds such as social aid funds of civil administration or with the social insurance funds of towns' residents. Public financial support for the schemes, the schemes should increase the access, transparent operation and financial accountability and scientific managements etc. Further, the results show different models have different effects on the outpatient and inpatient utilization. In the model RMHC, inequality utilization was mainly from outpatient services; as to NCMS, it was mainly from inpatient services.

The reasons were that two models with different scheme design, so the co-payment should be mainly reduced from outpatient services in RMHC, from inpatient services in NCMS.

6.3 Change payment methods to health facilities

The results found that the people living in Tiechang have higher utilizations of outpatient service then the people in the other community Gaofeng. A possible explanation is the fact that community Tiechang implemented the RMHC, which in its design considering the payment change – village doctors receive the monthly salary, plus a bonus of one RMB for every village treated. Doctors are supposed to sell only certain drugs at prices set by the governments and submit records of each prescription (Nicholas Zamiska, 2007). The RMHC changed the village doctors' the behaviors and strengthened the surveillance; other explanations might be the local governments paying attention to and support the project, and the staffs at the project office have higher capability in the community Tiechang.

REFEFENCES

1. Ministry of Health PRC. 2003 Main result of the third national health services survey. www.moh.gov.cn
2. .Hong Wang et al.. (2005). Community-based health in poor rural China: the distribution of net benefits. Oxford University Press 2005, 366-374.
3. Waters, H (1999). Measuring the impact of health insurance with a correction for selection bias: a case study of Ecuador. *Health Economics and Econometrics*, 8, 473-483.
4. Yip, W., & Berman,P.(2001). Targeted health insurance in a low income country and its impact on access and equity in access: Egypt's school health insurance. *Health Economics*, 10,207-220
5. Johannes P.Jütting, (2003). Do Community-based health insurance schemes improve poor people's access to health care? Evidence from Rural Senegal. *World Development* Vol. 32.No. 2, 273-288.

6. Manning, M. Newhouse, et al. (1987). Health insurance and the Demand for medical care: Evidence from a Randomised Experiment. *American Economic Review*, Vo.77:251-277.
7. Cretin S, Duan NH, Williams AP Jr, Gu XY, Shi YQ. 1990. Modeling the effect of insurance on health expenditures in the People's Republic of China. *Health Services Research* 25: 667–89.
8. Duan N, Manning WG, Morris CN, Newhouse JP. 1983. A comparison of alternative models for the demand for medical care. *Journal of Business and Economics Statistics* 1: 115–26.
9. Nicholas Zamiska, (2007). In China, Farmers Become Health-Care, *The Wall Street Journal*, A1-A22
10. William Hsiao et al.(2004). . Talking about the rural mutual health care in China. *Chinese Health Economics*, 23(7):5-8
11. . Sara Bennett,(2004). The role of community-based health insurance within the health care financing system: a framework for analysis, *Health Policy AND planning* 19(3): 147-157
12. “Solve the expensive health expenditure for the residents, and energetically promote system reform” 2005, people’ website- News of China Government, <http://gov.people.com.cn/>.
13. Gu X, Bloom G, Tang S et al. 1993. Financing health care in rural China: preliminary report of a nationwide study. *Social Science and Medicine* 36: 385–91.
14. Hsiao WC. 1984. Transformation of health care in China. *New England Journal of Medicine* 310: 932–6
15. Ministry of Health PRC. 1999. Research on National Health Services: an analysis report of the Second National Health Services Survey in 1998(II). Beijing: National Center for Health Information and Statistics.
16. Joseph P. Newhouse et al.1996.Free for all: lessons from the Rand health insurance experiment. Harvard University Press. 1996
17. Jonannes P. Jütting. 2005.Health insurance for the poor in developing countries. Ashgate Publishing Company:103-104
18. Martin Gulliford et al editors.2003. Access to health care. Published by Routledge Taylor &Francis Group
19. Liu Gordon et al. 2003. Income Growth in China: on the role of health. The report was presented at the 4th World Congress of International Health Economics Association (iHEA), San Francisco, June 15-19,2003
20. Susan L. Ettner.1996. Adverse selection and the purchase of Medigap insurance by the elderly. *Journal of Health Economics* 16:543:560
21. Adam Wagstaff et al. 2007. Extending Health Insurance to the Rural Population: An Impact Evaluation of China’s New Cooperative Medical Scheme. World Bank Policy Research Working Paper, March 2007.