

# Study on Urban and Rural Medical Insurance Co-ordination Improving Rural Family Education

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**Abstract:** Rural areas are an important foundation for China's social stability. Actively promoting the implementation of the urban and rural medical insurance system and providing better medical security for rural residents can improve their family's ability to resist risks, thus promoting the increase of rural family education expenditure. This paper uses CHFS data in 2017 and 2019 to study the impact of urban and rural medical insurance co-ordination and rural family education expenditure by constructing a fixed effect model. The results show that participation in urban and rural medical insurance can promote rural family education expenditure; through heterogeneity analysis, it is found that compared with urban families, participation in urban and rural medical insurance has a significant role in promoting rural family education expenditure; in terms of regional characteristics, compared with rural families in economically developed eastern regions, the promotion effect of urban and rural medical insurance on rural family education expenditure in central and western regions is more significant.

**Keywords:** Urban and rural medical insurance coordination; Education expenditure; Rural households

## 1. Introduction

Since the reform and opening up of China, China has made remarkable achievements in economic development, and the gap between urban and rural areas has gradually narrowed. However, problems such as insufficient medical resources and low quality of medical services still exist in rural areas, resulting in a relatively low level of medical insurance coverage for rural residents. As awareness of social security grows, people's demand for medical insurance continues to increase, forcing the government to take measures to improve the medical insurance system and increase the coverage and level of medical insurance. Rural areas are an important foundation for China's social stability, and safeguarding the basic living needs and medical protection of the rural population is one of the key factors in promoting rural development and stability. When a rural family member suffers from a major illness without timely treatment may lead to more serious health risks thus affecting the family's labor income. [1] Through urban-rural health insurance coordination, the burden of medical expenses on rural families can be reduced, their quality of life and educational input can be improved, and social stability and economic development in rural areas can be promoted.

In recent years, scholars' studies related to the impact of urban-rural health insurance integration policies have mainly focused on the medical protection of residents, consumption and savings, and equity of social security benefits. Li Yonghui et al [2] found through research that urban-rural health insurance integration can effectively reduce the overtime and overwork of rural laborers; the urban-rural health insurance integration implemented in the workplace is much more effective in alleviating the overwork of migrant workers relative to the domicile. Wen Xing-xiang et al [3] found that urban-rural health insurance has a significant promotion effect on the total annual consumption of the migrant population, and has a stronger promotion effect on the consumption of the new generation as well as high-income migrant workers' families. As for the research on the factors influencing family education expenditure, the factors influencing family education expenditure are mainly studied from the internal perspective of the family and the external perspective. For example, Zhang Su [4] and others, through the study of family education expenditure in the new rural insurance has a significant increase, and due to the relationship between participants and children, marital status, gender, family economic status and other factors, there are significant differences. Fan Xiaojie et al [5] found that in the context of the education poverty alleviation policy vigorously implemented by the state, the actual education expenditure of poor families is relatively lower than that of non-poor families due to the enjoyment of the state's educational assistance. Therefore, this paper chooses the CHFS data of 2017 and 2019 to conduct empirical research,

and puts forward policy recommendations in favor of promoting the education expenditure of rural families, so as to reduce the education gap between urban and rural families.

## 2. Research hypothesis

In most parts of China, due to the relatively low household income and the relatively single structure of household economic sources, rural households have a low ability to resist the risk of major diseases suffered by family members, which may lead to their families falling into economic difficulties and having to cut down household consumption expenditures (including education expenditures that are very important for the future development of the family). Participating in the basic medical insurance for urban and rural residents can improve the ability of rural families to resist the risk of major diseases suffered by family members, thus escorting the sustainability of family education expenditure. Accordingly, this paper proposes the following hypothesis:

H1: Urban and rural medical insurance co-ordination can improve rural family education expenditure

Affected by the level of economic development, there are significant differences in family education expenditure in eastern, central and western regions of China; the eastern region usually has a higher level of family education expenditure. Families in these areas generally have higher income levels and more educational resources. Parents generally pay more attention to their children 's education investment, including higher expenditures on preschool education, extracurricular counseling, and training courses. Family education in the central and western regions some relatively developed cities, the difference between family education expenditure and the eastern region may be relatively small, but in rural areas or economically underdeveloped areas, due to the low level of family income and the relative lack of educational resources, family education expenditure may be relatively small. Accordingly, this paper proposes the following hypothesis:

H2: The impact of urban and rural medical insurance on rural family education expenditure in different regions is different.

## 3. Data description and model construction

### 3.1. Variable selection

This paper chooses rural family education expenditure as the explained variable. According to the CHFS questionnaire ' last year, your family spent a total of how much money on education and training ' to count their family 's education expenditure.

Table 1: Variable meaning and descriptive statistics

		Variable name	Definition
Variable being explained	ep	educational outlay	Expenditure on family education and training in the past 12 months
Core explanatory variables	yib	urban-rural integrated medical insurance system	Participation in basic medical insurance for urban and rural residents is set to 1, and the rest is set to 0.
Control variable	de	education degree	The education level of the head of the household, the larger the number, the higher the education level.
	he	health degree	The health status of the head of the household, the smaller the number, the healthier.
	toi	family income	total income for the household
	tod	household debt	Total household debt
	ge	sexuality	Gender of household head
	ag	Age	Age of head of household
	ma	marital status	Marriage and remarriage are recorded as 1, and the rest are recorded as 0.

The explanatory variable is set to a dummy variable. The answer to ' what kind of medical insurance does family members have ' in the CHFS questionnaire was selected, and the person who chose ' basic medical insurance for urban and rural residents ' was set to 1, and the rest of the choices were set to 0.

Since this paper mainly studies the impact of urban and rural medical insurance co-ordination on family education expenditure, and participating in the new rural cooperative medical insurance may also affect rural family education expenditure, making the final estimation result biased, it is also selected to set it to 0.

The control variables of this paper are mainly divided into two layers. The first layer is the family characteristic variable, which mainly controls the family annual income, family debt and so on. The second level is the characteristic variable of the head of household, which mainly controls the variables such as gender, marriage, household registration, education level and health status of the head of household [6]. The specific meaning of the main variables used in the regression of this paper is detailed in table 1.

### 3.2. Data sources and descriptive statistics

The data used in this paper comes from the 'China Household Finance Survey' (CHFS) project conducted by Southwest University of Finance and Economics in 2017 and 2019. The data sample covers 29 provinces (autonomous regions and municipalities directly under the central government) across the country. Finally, the information of 34643 households and 107008 family members was collected. The data has national and provincial representation, which provides a very reliable data source for the data analysis of this paper. In this paper, when selecting the survey data, it is found that there are a certain number of missing values in some of the data, which may be due to the fact that the respondents do not want to answer or do not know how to answer, and fully protect the personal privacy of the respondents. The questions that must be considered in the process of conducting the questionnaire. In order to ensure the authenticity of the data, this paper chooses to clean some of the data involved in this paper as far as possible on the premise of ensuring the number of samples. At the same time, in order to avoid the influence of extreme values on the results of this study, the data was processed by 1 % winsor tail reduction, and 12533 households were retained as the sample size of this paper. The statistical description of the main variables in this paper is shown in Table 2.

Table 2: Descriptive statistics of each variable

Variable	Mean	Standard deviation	Median	Minimum	Maximum	Sample number
ep	2,817.079	6,461.565	0.000	0.000	35,000.000	25,066
yib	0.039	0.193	0.000	0.000	1.000	25,066
de	2.453	1.075	2.000	1.000	8.000	25,066
he	2.912	1.055	3.000	0.000	5.000	25,066
toi	46,475.923	59,391.262	26,692.000	-8,541.935	351,900.000	25,066
tod	27,431.922	72,891.056	0.000	0.000	476,000.000	25,066
ge	1.393	0.488	1.000	1.000	2.000	25,066
ag	56.786	13.038	57.000	0.000	117.000	25,066
ma	0.850	0.357	1.000	0.000	1.000	25,066

### 3.3. Benchmark regression model

In order to increase the expenditure of family education in urban and rural medical insurance, the benchmark measurement model established in this paper is set as follows:

$$ep_{i,t} = \alpha + \beta yib_{i,t} + \gamma' Control_{i,t} + \mu_j + \lambda_t + \varepsilon_{i,t} \quad (1)$$

In formula (1), i means family, j means region, t means year, ep means family education expenditure; yib represents whether someone in the family purchases the basic medical insurance for urban and rural residents. If it is purchased, it is 1, otherwise it is 0; Control represents the control variable;  $\mu$  denotes the fixed effect of provinces;  $\lambda$  denotes the time fixed effect;  $\alpha$ ,  $\beta$  and  $\gamma$  are the parameters to be estimated, and  $\varepsilon$  is the random error term.

## 4. Empirical analysis

### 4.1. Baseline regression

Table 3 reports the results of the benchmark regression. Among them, Column (1) represents the

regression results without control variables, individual fixed effects and time fixed effects; the analysis shows that the impact of urban and rural medical insurance on family education expenditure is significant at the 5 % level, and the coefficient is positive, indicating that family education expenditure has increased significantly after participating in urban and rural medical insurance. Column (2) represents the regression results of adding control variables, uncontrolled provincial fixed effects, and time fixed effects. Column (3) indicates the regression results of adding control variables and provincial fixed effects at the same time; column (4) reports the regression results of adding control variables, provincial fixed effects and time fixed effects at the same time. The benchmark regression results show that the impact of urban and rural medical insurance co-ordination on family education expenditure is still significant after adding control variables and controlling provincial fixed effects and year fixed effects, indicating that participation in urban and rural medical insurance co-ordination will increase the education expenditure of rural households, supporting the research hypothesis 1 of this paper.

Table 3: Benchmark regression results

	ep			
	(1)	(2)	(3)	(4)
yib	446.854** (2.28)	495.725*** (2.59)	553.661*** (2.87)	382.203* (1.96)
Control variable	No	Yes	Yes	Yes
Provincial fixed effect	No	No	Yes	Yes
Time effect	No	No	No	Yes
N	25000	25000	25000	25000

t statistics in parentheses: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

#### 4.2. Robustness test

In this paper, the standard error is replaced by heteroscedastic standard error and clustering standard error to avoid the possible influence of heteroscedasticity and clustering effect on the benchmark regression results as much as possible. And control the potential influencing factors. [7] At the same time, in order to minimize the impact of the extreme values of the data used in this paper on the final results, the bilateral tail is reduced by 2.5 %. After the above processing, it can be clearly observed that the coefficient estimates of some variables have changed. For example, after the heteroscedastic robust standard error processing, the significance of some variables has been changed, and their standard errors and t values have also been adjusted accordingly. In general, heteroscedasticity robust standard error, clustering standard error and bilateral tail-down 2.5 % processing effectively improve the stability of the model, making the parameter estimation more statistically significant and reliable. The regression results through Table 4 are still significantly reliable, indicating that the processing methods of these robustness tests help to ensure that the statistical inferences and conclusions obtained are more reliable and provide a more solid foundation for further analysis and decision-making.

Table 4: Robustness test results

	(1)	(2)	(3)
	robust standard error	Clustering standard error	Double-tailed 2.5 %
yib	382.203* (1.73)	382.203* (1.73)	313.041* (1.81)
Control variable	Yes	Yes	Yes
Provincial fixed effect	Yes	Yes	Yes
Time effect	Yes	Yes	Yes
N	25000	25000	25000

t statistics in parentheses: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

#### 4.3. Heterogeneity analysis

In order to further test hypothesis 1, this paper selects the samples related to rural households and those related to urban households in the original data to conduct regressions separately, and the results, as shown in columns (1) and (2) in Table 5, show that participation in the urban-rural health insurance

pool is insignificant for the education expenditures of urban households, while it is significant for the education expenditures of rural households. The reason for this phenomenon may be that the income level of urban households is usually higher and they have more financial ability to invest in their children's education. In addition, educational resources are relatively more abundant in urban areas, including high-quality schools, extracurricular training institutions, and cultural activities, and it is also easier for parents to obtain educational information and choose educational resources that are suitable for their children. In contrast, the income level of families in rural areas is usually relatively low, and some families may not be able to provide more educational resources and expenditures for their children due to financial constraints. In addition, there is a relative lack of educational resources in rural areas. Schools may be relatively outdated in terms of teachers and teaching facilities, and there is also a lack of supplementary educational resources, such as extra-curricular training institutions.

Table 5: Urban-rural heterogeneity

	(1)	(2)
	Rural households	Urban households
yib	572.587**	164.066
	(2.40)	(0.71)
Control variable	Yes	Yes
Provincial fixed effect	Yes	Yes
Time effect	Yes	Yes
N	22000	36000

t statistics in parentheses: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Hypothesis H2 proposes that the impact of urban-rural health insurance integration on the education expenditures of rural households in different regions is different.

Considering that different levels of regional economic development may have different impacts on rural household education expenditures, this paper conducts regression analyses on the samples of rural households in the eastern region and the sample of rural households in the western region, and the results are shown in columns (1) and (2) of Table 6, which indicate that participation in the urban-rural health insurance system is insignificant for the education expenditures of the rural households in the eastern economically developed region, while it is significant for the education expenditures of the rural households in the economically underdeveloped regions of the central and western regions. Household education expenditure is significant. This phenomenon may be due to the fact that the eastern region is relatively economically developed, has a richer structure of income sources, has a better social security system, and is more resistant to risk than rural households in the central and western regions.

Table 6: Regional heterogeneity

	(1)	(2)
	The western and middle regions	The east part
yib	461.932**	179.235
	(2.08)	(0.43)
control variable	Yes	Yes
Provincial fixed effect	Yes	Yes
time effect	Yes	Yes
N	19000	5759.000

t statistics in parentheses: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 5. Conclusion

This paper uses 2017 and 2019 CHFS data to empirically analyze the relationship between urban and rural medical insurance co-ordination and rural family education expenditure. It is found that rural families who purchase basic medical insurance for urban and rural residents have a significant positive effect on their family education expenditure. After replacing the standard error with the heteroscedastic robust standard error, the clustering robust standard error and the bilateral tail-down 2.5 %, the regression results are still significantly reliable. The rural family-related samples and urban family-related samples in the original data were selected for regression. The participation in urban and rural medical insurance co-ordination was not significant for urban family education expenditure, but significant for rural family education expenditure ; after dividing the surveyed areas into economically developed areas in the east

and economically underdeveloped areas in the central and western regions, the heterogeneity analysis found that participation in urban and rural medical insurance co-ordination was not significant for rural family education expenditure in economically developed areas in the east, but significant for rural family education expenditure in economically underdeveloped areas in the central and western regions. Based on the above conclusions, this paper puts forward the following suggestions:

First, improve the coverage of rural medical security. The government can make more rural residents enjoy basic medical security by expanding the coverage of medical security and increasing the proportion of reimbursement. This can reduce the risk of poverty caused by illness in rural families and release more economic resources for their children's education.

Second, strengthen the construction of primary health care services. Increase investment in rural grassroots medical and health service institutions, improve the quality and coverage of medical services. This can make it easier for rural residents to obtain basic health care services and reduce the cost burden caused by medical treatment.

Third, establish differentiated medical insurance policies. In view of the different economic development levels and the distribution of medical resources in the eastern, central and western regions, a differentiated medical insurance policy can be established. For example, more favorable medical insurance policies can be introduced for economically underdeveloped rural areas in the central and western regions, including increasing the reimbursement ratio and reducing the deductible, so as to reduce the medical burden of rural residents and release more family funds for education expenditure.

Through the above policy measures, the medical security level of rural residents can be improved, and the pressure of medical expenditure can be reduced, so as to indirectly increase their expenditure on children's education. This will help promote the development of education in rural areas, narrow the gap between urban and rural education, and promote the overall development of rural economy and society.

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