

A Study on the Labor Supply Effect of Long-term Care Insurance System

— Take Changchun Medical Care Insurance as an Example

*Minghe Shang¹, Shengji Li², Meijing Wang³

(Changchun University of Technology, China)

Minghe Shang (2000-), female, born in Yushu, Jilin, postgraduate, School of Public Administration, Changchun University of Technology, research direction: social security.

Shengji Li (1986-), male, born in Yongji, Jilin, associate professor, School of Public Administration, Changchun University of Technology, research direction: labor economy.

Meijing Wang (1997-), female, born in Xuchang, Henan, postgraduate, School of Public Administration, Changchun University of Technology, research direction: public sector human resource management.

*Minghe Shang. Tel: 18404360261, Email: 1295906294@qq.com

ABSTRACT

Based on the micro data of Changchun medical care insurance system, the paper adopts the natural experiment method and the difference-in-difference method to quantitatively analyze the influence of Changchun medical care insurance system on the labor supply of family members. The results show that the medical care insurance system has a positive effect on the labor participation of family members, and is conducive to improving the working time of family members from general perspective. From different groups, the medical care insurance system promoted both the labor participation and labor time of both the low-and middle-income groups, but did not show a significant impact on the high-income groups.

Keywords: Medical care insurance; Long-term care insurance; Labor supply

1. INTRODUCTION

At present, China has nearly 250 million people aged 60 and above. There are more than 40 million disabled and semi-disabled elderly people. For every 1% increase in the aging population, the potential labor supply and real labor supply fell by about 2%, and the labor participation rate of the economic active population fell by 1.2%. A study by Kohei (2004) using long-term care insurance data found that the insurance burden of Japanese companies increased, shifting the burden to employees and consumers by raising product prices, layoffs and pay cuts. Bolin (2008) found that the burden of family care will bring significant gender employment differences. Logically speaking, the long-term care insurance system can reduce the medical and care economic burden of the disabled elderly by providing subsidies for social care, reduce the cost of social care, expand the scope of social care, accelerate the transfer of informal family care to social care, further reduce the care pressure of children and reduce the intergenerational

transfer payment of children to their parents.

2. DATA SOURCE AND MODEL SETTING

2.1. Data sources

From February to June 2019, this paper randomly selected 10 designated long-term care service institutions in Changchun to conduct this micro survey online. The main contents of the survey include many aspects such as Internal factors of population, employment status, working hours, income level of the major family members of the disabled or semi disabled elderly in 2018 and 2019. This paper selects a sample of family members aged 18 to 65, and finally obtains 136 samples of labor supply in 2018 and 134 samples in 2019.

2.2. Model setting

Based on the Inclusion of moderately disabled persons in medical care insurance coverage policy in Changchun in 2017, this paper constructs the following

the difference-in-difference method:

$$\tau = y_i^1 - y_i^0 = \alpha + \beta t_i + \gamma z_i + \delta g_i + \varepsilon_i, \quad g_i = t_i z_i \quad (1)$$

In formula (1), y_i^1 is the treatment effect received by the individual, y_i^0 is the effect that the individual is not treated, τ is the difference-in-difference estimation, β is the time effect of the sample, γ is the group effect, δ is the labor supply effect of medical care insurance system, ε_i indicates the interference item. This paper holds that labor supply is constrained by labor participation rate and labor time length. Based on this, the employment equation can be constructed as follows:

$$\text{logit}(p_i) = \log(p_i/(1 - p_i)) = \alpha + \sum_{i=1}^n \alpha_i x_i + \mu_i \quad (2)$$

In formula (2), p_i represents the employment probability of the sample i , x_i is the influencing factor of employment of the sample i , and α_i represents the regression coefficient of the factors affecting individual i employment, μ_i indicates the interference item. The equation of working time is:

$$y_i = \beta + \sum_{i=1}^n \beta_i k_i + \varphi_i \quad (3)$$

In formula (3), y_i represents the total working time of the sample i in a week, k_i is the influencing factor of working time of sample i , and β_i represents the regression coefficient affecting working time; φ_i indicates the interference item. According to the principle of natural experiment, based on formulas (1), (2) and (3), this paper sets the difference-in-difference regression model of employment and working time as follows:

$$\text{logit}(p_i) = \alpha + \alpha_1 z_1 + \alpha_2 t_2 + \alpha_3 g_3 + \sum_{i=4}^n \alpha_i x_i + \mu_i' \quad (4)$$

$$y_i = \beta + \beta_1 z_1' + \beta_2 t_2' + \beta_3 g_3' + \sum_{i=4}^n \beta_i k_i' + \varepsilon_i' \quad (5)$$

In formula (4) and formula (5), z is a grouped variable, α_1 and β_1 represent group effects; t is the

group variable of the year, α_2 and β_2 represents the time effect, g is the interaction term of z (group effect) and t (time effect), α_3 and β_3 represents the labor supply effect of medical care insurance system. x_i and k_i' are the control variables of the model, μ_i' and ε_i' are the interference terms of difference-in-difference employment equation and working time equation.

2.3. Variable definition

The explanatory variables of this paper are the labor participation rate and working time of the main family members. Among them, whether family members are employed or not is taken as the indicator to measure the labor participation rate. If they have a job, it is 1, otherwise it is 0. The working time of family members in a week is used as an indicator to measure the working time. The core variable is whether to obtain medical care insurance services. The answer Yes is 1 and No is 0. The control variables mainly include the internal factors of the population and income, in which the male is 1 and the female is 0; 0 for uneducated, 1 for primary school, 2 for junior middle school, 3 for senior high school, 4 for undergraduate and 5 for graduate students; 1 for married and 0 for unmarried; The income level is the logarithm of annual income, including low income, middle income and high income.

3. ESTIMATED RESULTS

As shown in Table 1, the regression results of Difference-in-Difference showed that the labor participation rate of the experimental group was 18.2% higher than that of the control group. The weekly working time of the main family members who received medical care services increased by 2.876 hours.

Table 1. The regression results of Difference-in-Differences of medical care insurance system on labor supply

Variables	Year	Control group	Experience group	Single difference	Difference-in-difference
Labor participation (%)	2018	0.541	0.873	0.332***	-
	2019	0.333	0.847	0.514***	0.182**
Working time (h)	2018	37.243	50.907	13.664***	-
	2019	35.958	52.498	16.540***	2.876**

Note: " * * " indicates $P < 0.01$; " * " indicates $P < 0.05$; " " indicates $P < 0.1$.

As shown in Table 2, the Inverse Milln's Ratio is -0.306 and -0.310, and both were significant, indicating that the fitting effect of Heckman two-stage model fits

well. From the perspective of labor participation and working time, the interaction items (policy effect), gender, marriage and education level of the year group and the

experimental group have a significant positive impact on the labor participation and labor time of the family members, and income has a significant negative impact on the labor participation of the family members.

Table 2. Heckman two-stage regression results of medical care insurance system on labor supply

Variables	Labor participation	Labor time
The year group	0.201**	0.658**
	(0.181)	(0.295)
The experimental group	0.342**	0.248***
	(0.162)	(0.095)
The interaction items (Policy effect)	0.412*	0.587***
	(0.221)	(0.070)
Gender	0.355***	0.299*
	(0.116)	(0.165)
Age	-0.387	-0.476
	(0.284)	(0.410)
Education level	0.645***	0.969***
	(0.189)	(0.329)
Income	-0.406***	0.312***
	(0.075)	(0.123)
Marriage	0.299**	0.425*
	(0.147)	(0.228)
λ	-0.306**	-0.310**
	(0.168)	(0.155)
Wald	1113.640	881.880

Notes: " * * " indicates $P < 0.01$; " * " indicates $P < 0.05$; " * " indicates $P < 0.1$. λ is the Inverse Milln's Ratio of Heckman two-stage regression method. If the Inverse Milln's Ratio is significant, it proves that there is a correlation between the interference terms of employment equation and labor time equation.

As shown in Table 3, all the Inverse Milln's Ratio are significant, indicating that the fitting effect of Heckman two-stage regression model fits well. From the perspective of labor participation and the working time, the interaction item (policy effect) has a significant positive impact on the labor participation and the working

time of low-income and middle-income groups, while the interaction item (policy effect) has no significant impact on the labor participation and labor time of high-income groups, indicating that the family members will increase labor participation and working hours when low-income groups obtain medical care services.

Table 3. Heckman two-stage regression results of medical care insurance system on labor supply of different income groups

Income groups	Low-income groups		Middle-income groups		High-income groups	
	Labor participation	Labor time	Labor participation	Labor time	Labor participation	Labor time
	0.231	0.272*	0.314	0.368***	-0.372	-0.169

The year group	(0.211)	(0.148)	(0.341)	(0.110)	(0.352)	(0.161)
The experimental group	-0.201	0.102***	0.282	0.377***	0.433	0.531**
	(0.231)	(0.027)	(0.202)	(0.101)	(0.393)	(0.260)
The interaction items (Policy effect)	0.255***	0.253**	0.351**	0.446**	0.532	0.526
	(0.072)	(0.125)	(0.170)	(0.202)	(0.542)	(0.582)
λ	-0.098***	0.609*	-0.023**	0.129	-0.051*	-0.351***
	(0.014)	(0.325)	(0.012)	(0.263)	(0.028)	(0.113)
Wald	361.933	809.197	285.427	233.300	211.617	358.767

Notes: " * * *" indicates $P < 0.01$; " * *" indicates $P < 0.05$; "*" indicates $P < 0.1$. λ is the Inverse Milln's Ratio of Heckman two-stage regression method. The coefficients of control variables are omitted due to space constraints.

4. CONCLUSIONS

The paper adopts the natural experiment method and the difference-in-difference method to quantitatively analyze the influence of Changchun medical care insurance system on the labor supply of family members. Generally speaking, the medical care insurance system have a significant positive impact on the labor participation of family members and helps to improve the working hours of family members; From the perspective of different groups, the medical care insurance system can promote the labor participation and working time of low-income groups, but has no significant impact on high-income groups.

Based on the research results, the paper put forward the following conclusions: first, the government can further expand the scope of insurance coverage and include all urban and rural residents in the scope of medical care insurance, which will help improve the quality of life of urban and rural residents. Second, the government should improve the compensation mechanism of the medical care insurance system, and appropriately increase the compensation proportion of the medical care insurance, especially the compensation proportion for the disabled elderly in the designated institutions. So the disabled elderly can get care security and enjoy better medical services, which is conducive to giving better play to the labor supply effect of the medical care insurance system.

ACKNOWLEDGMENT

From the beginning of the topic selection to the final conclusion of this paper, we need to thank the relevant scholars for their careful research. At the same time, I would like to thank the organizer of the conference for providing me with this opportunity. This paper was

supported by the Scientific research project of Education Department of Jilin Province "Policy Effect of Long-term Care Insurance in Changchun city" (Project Approval No: JJKH20200692SK).

REFERENCES

- [1] Report on the development of China's aging industry.
- [2] Komamura K, Yamada A. Who bears the burden of social insurance? Evidence from Japanese health and long-term care insurance data[J]. Journal of the Japanese and International Economies, 2004, 18(1): 565-581.
- [3] Bolin K, Lindgren B, Lundborg P. Your next of kin or your own career? caring and working among the 50 + of Europe[J]. Journal of Health Economics, 2008, 27(3): 718-738.
- [4] Huimin Zhang et al. Impact of Formal Care Use on Informal Care from Children after the Launch of Long-Term Care Insurance in Shanghai, China[J]. International Journal of Environmental Research and Public Health, 2020, 17(8) : 2938-2938.