

The Impacts of Health on Income of the Poor —An Empirical Analysis Based on Gansu Tibetan Area

Enmei He^{1,*}

¹*School of Economics, Sichuan Agriculture University; Chengdu, Sichuan 611130, China*

**Corresponding author. Email: mayheen@163.com*

ABSTRACT

Depending on the survey data in the Tibetan areas of Gansu Province, this survey uses Weighted Least Squares to explore the impact of health on the income of the poor from the micro level. The results of the study indicate that the personal health level of the poverty-stricken population in the Tibetan areas of Gansu has a significant impact on household operating income and employment income. There is a non-linear relationship between the proportion of chronic diseases or disability of the family members and the income. And the proportion has a significant impact on household business income, that is, first promotion and then hindrance. On the contrary, it has a different impact on work income from household operating income, but not significant.

Keywords: *health, poverty reduce, income of farmers*

1. INTRODUCTION

Since the reform and opening up, China's rural poverty alleviation and development has reduced more than 700 million poor people, contributing more than 70% to global poverty reduction. However, with the refinement of poverty targeting and the diversification of poor groups, the traditional relief-type poverty alleviation that relies on economic growth and flood irrigation has been difficult to effectively alleviate poverty, which has caused a huge waste of resources. Therefore, the proposal of the Targeted Poverty Alleviation strategy is in line with the reality that the causes of poverty and return to poverty are more diversified under the new situation, and proposes new methods and new paths for poverty governance. For special types of poverty, we need to explore more effective anti-poverty strategies.

According to the theory of capacity poverty, poverty is mainly due to the deprivation of basic viable capabilities and the development opportunities are hindered, not just the low income [1]. The core solution to addressing capacity poverty is to build and enhance capacity through human capital investment, thereby increasing opportunities for income acquisition. Poor people have a single source of income, with agricultural operations and labor income as the main sources, and objectively put forward requirements for healthy human capital. Paying more attention to the health problems of poor groups, effectively guaranteeing their basic feasible capabilities, and improving the ability of poor individuals to obtain income, prevent and block various risks, is an effective way to manage poverty in ethnic regions.

1.1. Related Work

1.1.1 Health and poverty vulnerability

Scholars have researched the relationship between health and poverty. Based on the perspective of income and consumption, it is generally agreed that a decline in health will increase poverty vulnerability, and may cause poor groups to fall into the trap of poverty cycle. Moreover, poverty vulnerability and health level decline [2]. Focusing on communities and families, research finds that health risks are positively related to the possibility of farmers falling into poverty [3]. Health shocks will cause individuals to focus on current consumption and neglect capacity investment, thereby increasing poverty vulnerability [4]. Insufficient nutrition and poor health conditions result in weak human capital for farmers, which are important causes of persistent poverty [5].

1.1.2 Impact of health on income

The research on the impact of health on income mainly focuses on two aspects, one is the relationship between health and income growth, and the other is the relationship between health and income inequality.

From the perspective of income growth, some scholars believe that the health status of farmers has a significant positive impact on income [6]. And from the perspective of household income, it is found that the health investment income in rural areas is higher, and the ability to obtain income for rural labor Over-dependence on one's own health [7]. Health human capital mainly affects farmers' income through labor income [8]. The improvement of the level of

health human capital is conducive to promoting rural residents' labor participation, thereby increasing their agricultural labor income [9].

Although studies have confirmed that the health effect is more significant from the perspective of narrowing the income gap, income inequality will be fed back to health inequality [10]. The role of nutrition and health in narrowing the income gap and reducing poverty is mainly through increasing labor productivity [11], but the health risks and nutrition gaps of low-income groups are too large, which will increase the probability of returning to poverty and further aggravate social injustice [12]. Moreover, there is a serious imbalance in human capital in rural poor areas of China [13].

1.2. Our Contribution

This paper takes the poor in Gansu Tibetan area as the research object, and studies the relationship between the personal health status and the proportion of family members suffering from chronic disease or disability to their per capita family business income and labor income from the perspective of feasible capabilities, and analyzes the impact of health on different types of income. Raise farmers' awareness of the importance of health human capital investment and explore ways to increase farmers' income.

1.3. Paper Structure

The rest of the paper is organized as follows. Section 2 introduces the data sources and samples of this paper. Section 3 presents regression models and variables. Section 4 develops an analysis of regression results. Finally, Section 5 concludes the paper.

2. DATA AND SAMPLES

The data in this paper originated from a household survey

on multi-dimensional poverty governance in Tibetan areas of Gansu in 2016. The survey content involved the basic characteristics of households, household income and expenditure, personal health, and labor conditions. The original sample is a collection of 239 poor and non-poor households randomly selected. The survey is conducted on a household basis. Each household questionnaire contains detailed basic information of family members. According to the research purpose, this paper removes the samples of non-poor households, and selects non-school students aged 16-65 who are in the labor age stage as the research sample. After deleting the samples with missing variable data, the actual number of valid samples in this paper is 353.

3. REGRESSION MODELS AND VARIABLES

This paper studies the impact of health on income, specifically the impact of personal health and the overall health of family members on household business income and labor income. A regression model is constructed, and the impact of health on the two types of income is compared and analyzed through regression results. Set the model as follows:

$$\ln(y_i) = \alpha_0 + \alpha_1 \text{health}_i + \alpha_2 \text{percent}_i + \alpha_3 X_i + \varepsilon_i$$

In the formula, y_i is income, and i values are 1 and 2, which represent household business income and labor income. Health_i and percent_i are explanatory variables. Among them, health_i is measured by individual self-assessed health, and is ranked according to the degree of good or bad. Percent_i represents the proportion of family members suffering from chronic disease or disability. X_i represents other possible individual characteristics that affect the income of the poor, and ε_i is a random error term. In this paper, the income is treated as logarithm to eliminate the non-normality of the data. Related variables and descriptions are shown in the table below.

Table 1 Variable description

	Variable	Variable description
Explained variable	Household business income per capita	Logarithm of business operating income per capita
	Personal labor income	Log of personal labor income
Explanatory variables	Individual health level	1 = relatively unhealthy, 2 = relatively healthy or average, 3 = healthy
	Squared share of chronic illness or disability among family members	The number of people with chronic illness or disability in the household as a percentage of the total squared
	gender	1 = male, 0 = female
	Age squared	Individual's actual age squared
Control variable	marital status	1 = Married, widowed, 0 = Unmarried, Divorced
	Nation	1 = Tibetan, 0 = Other nationalities
	Religion	1 = Religion, 0 = No religion
	Education level	1 = illiterate, 2 = educated in primary school, 3 = educated in middle school, 4 = educated in college or above
	Labor type	1 = partial loss of labor, 2 = general labor, 3 = skilled labor
	Per capita arable land area	Per capita arable land area, expressed in numbers

4. REGRESSION RESULTS

Regarding the research on the influencing factors of farmers' income, many scholars use the traditional regression analysis based on the least square method (OLS) [14] [15]

to describe the average impact of the explanatory variables on the explanatory variables. Due to the existence of heteroscedasticity, in order to eliminate its influence, this paper chooses the weighted least squares method for regression analysis. After returning to the family business income and labor income, the results are as follows.

Table 2 regression results

	Variable	Household business income		Personal labor income	
		Coefficient	T value	Coefficient	T value
Explanatory variables	Individual health level	0.181***	25.125	0.082**	2.126
	Squared share of chronic illness or disability among family members	0.808***	9.501	-0.218	-0.577
	Gender	-0.066***	-4.980	0.131*	1.755
	Age squared	2.54E-06	0.290	-4.68E-05	-1.123
Control variable	Marital status	0.017	0.471	0.446***	3.111
	Nation	0.691***	17.157	-2.530***	-6.793
	Religion	-0.860***	-45.925	-2.364***	-6.751
	Education level	-0.249***	-21.047	0.064	1.561
	Labor type	0.077***	3.106	0.068*	1.778
	Per capita arable land area	0.007***	4.655	-0.001	-0.618
	C		7.663***	98.700	5.010***

Note a: ***, **, * indicate significance levels at 1%, 5%, and 10%, respectively.

From the perspective of coefficients, the coefficients of individual health level on family business income and labor income are 0.181 and 0.082, respectively, which are both positive and significant. It proves that the health status of an individual can significantly affect the income level, and the improvement of personal health level will help increase family business income and labor income. That is, when the individual is at a healthier level, the time spent having to suspend labor and work due to the effects of illness and the like is reduced, which also helps to achieve a better mental state, which makes it easier to concentrate, improve labor efficiency, and increase income.

The square of the proportion of family members suffering from chronic disease or disability is positive for the family business income and negative for the income of migrant workers. This result is understandable. When a small percentage of members of the family need long-term care, in order to reduce the burden on the family, under the premise of taking care of the family, the healthy labor force tends to go out to seek higher incomes, and the migrant workers are mainly male. This is also confirmed in the gender variable. In rural China, families are still used for production and living. The health of other members of the family has a great influence on the place of employment and the direction of employment.

It is worth mentioning that education has a significantly negative coefficient on per capita household business income and a positive coefficient on migrant income, but it is not significant. Since the rate of return on education in non-agricultural activities is usually higher than that in agricultural activities, more educated family members are more likely to be attracted to non-agricultural activities [15] When individuals have a higher level of education, they will

inevitably be more inclined to leave agricultural production and engage in non-agricultural activities.

4. CONCLUSION

Firstly, the individual's health level has a significant role in promoting family business income and labor income. The healthier an individual is, the more it is conducive to the increase in family business income and labor income. Secondly, the proportion of family members suffering from chronic illness or disability has a non-linear effect on income. Among them, the effect on family business income is first suppressed and then promoted, while the effect on the income of migrant workers is reversed. Thirdly, education has a negative impact on family business income, because individuals who have received a higher level of education are more likely to engage in non-agricultural production.

REFERENCES

[1] Sen, A. Development as freedom (1999). The globalization and development reader: Perspectives on development and global change, 2014. 525.

[2] Xiao Huang. To what extent the health cause of poverty vulnerability: an empirical study based on chns rural data[J]. Statistics & Information Forum, 2013, 28(9):54-62.

[3] Wei Liu, Yuchun Zhu. The effects of the health risks

on vulnerability to poverty farmers[J]. *Hubei Agricultural Sciences*, 2014, 53(13):3216-3220.

[4] Yingfeng Fang, Wei Zou. Capacity investment, health shocks and poverty vulnerability[J]. *Economic Perspectives*, 2013(7):36-50.

[5] Quangong Chen, Zhongbin Li. A survey on the chronic poverty of ethnic minority rural households[J]. *China Rural Survey*, 2009(5):39-48.

[6] Yinqing Tan, Zhizhang Wang, Guirong Liu. A Study on the Impact of Human Capital on Farmers' Income in China's Continuous Poverty Areas[J]. *The World of Survey and Research*, 2014(10):27-31.

[7] Liu,G.G.,William.H.Dow, Alex.z.Fu,J.Akin. And Peter Lance. Income Productivity in China :On The Role of Health[J]. *Journal of Health Economics*, 2008, Vol.27(1)

[8] Mingwang Cheng, Jin Yanhong, Qing'en Gai, et al. Accounting for income inequality between households in rural china :a regression based approach[J]. *China Economic Quarterly*, 2016(3):1253-1274.

[9] Yiqiu Wang, Lei Liu. Impact of New Rural Cooperative Medical Insurance and Health Human Capital on Labor Participation of Rural Residents[J].

Chinese Rural Economy, 2016(11):68-81.

[10] Mingwang Cheng, Jin Yanhong, Qing'en Gai, et al. Focusing on education or health improvement for anti-poverty in china : evidence from national household panel data[J]. *Economic Research Journal*, 2014(11):130-144.

[11] Juwei Zhang. Nutrition, health and productivity—evidence from poor areas of rural china[J]. *Economic Research Journal*, 2003(1):3-12.

[12] Yang Liu, Wei Zou. Does income growth necessarily lead to improved nutrition and balanced nutrition?[J]. *Economic Perspectives*, 2011(6):77-81.

[13] Linxiu Zhang, Hongmei Yi, Renfu Luo, et al. The human capital roots of the middle-income trap: the case of china[J]. *Journal of Renmin University of China*, 2014, 28(3):8-18.

[14] Morduch J, Sicular T. Rethinking Inequality Decomposition, with Evidence from Rural China[J]. *Economic Journal*, 2002, 112(476):93-106.

[15] Guanghua Wan, Yin Zhang. The impacts of growth and inequality on poverty dynamics in china[J]. *Economic Research Journal*, 2006(6):112-123.