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Analysis of Regional Differences in the Relationship Between Healthcare Expenditures and Per Capita Disposable Income of Urban Residents in China

Chuqi Chen[1,a,*]

[1]*Central University of Finance and Economics, Beijing, China*
a. 2021310003@email.cufe.edu.cn
**corresponding author*

Abstract: Based on the data of urban residents' healthcare expenditure and per capita disposable income in different regions of China, this paper explores the relationship between the two using regression analysis. The results show that per capita disposable income has a significant impact on healthcare expenditure, but the significance level and direction of the impact differ in different regions. In the Eastern and NorthEast regions, per capita disposable income has a significant positive effect on healthcare expenditure, which means that the higher the income level of residents, the higher their healthcare expenditure. In the Central region, the influence of per capita disposable income on healthcare expenditure is not significant, which means that the level of residents' income has less influence on healthcare expenditure in this region. In the Western region, per capita disposable income has a negative effect on healthcare expenditure, but the effect is not significant. This paper provides empirical evidence for understanding the geographic differences in healthcare expenditures of Chinese residents and provides a reference basis for formulating regionally differentiated healthcare policies.

Keywords: Healthcare Expenditure, Per Capita Disposable Income, Regional Differences, Panel Data

1. Introduction

For the past several years, the rapid development of China's economy has led to a continuous increase in the income level of the population. The trend in healthcare spending is also increasing. Healthcare expenditure has become a non-negligible part of people's consumption expenditure [1-4]. Healthcare is an important part of the national economy and an integral part of the social security system. Healthcare expenditure, as an important indicator of the health and living standards of the population, has received widespread attention in recent years. Understanding the relationship between healthcare expenditure and per capita disposable income is of great practical significance for the government to formulate reasonable healthcare protection policies, promote the balanced allocation of healthcare resources, and improve the health of residents.

It has been shown that economic growth is strongly associated with increased healthcare spending [5-6]. As the economy grows, the increase in income levels associated with GDP growth leads to an increase in healthcare expenditure [7-8]. You and Okunade noted that technological change and

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income are the major determinants of healthcare expenditure [9]. It is worth noting that urbanization can increase healthcare expenditure by changing healthcare-seeking behavior [4,10,11]. In addition, population aging is also a crucial factor affecting healthcare expenditure [10]. Higher levels of frailty among the elderly are associated with higher healthcare expenditures [5]. However, against the backdrop of China's economic slowdown, population aging is gradually outpacing the growth of healthcare expenditures [6].

China's vast territory and the different development histories of its regions have resulted in coastal areas being more economically developed than inland areas. Zhang and Coyte point out that China has made great progress in the equity of healthcare spending in the past years. However, the unequal regional distribution of healthcare resources and inequalities in healthcare provision remain, and addressing this is a challenge for all levels of government [2]. Academic studies show that healthcare spending in China has been growing over the past few years [2]. Scholarly research has confirmed that there are disparities in China's healthcare services between the Eastern, Central, and Western regions. The empirical results of the article suggest that economic development, education level, and urbanization all have an impact on differences in healthcare spending [1]. It was also suggested that developing countries should emphasize financial support for healthcare, which could be made more efficient by increasing financial subsidies in the area of healthcare [1]. At the same time, scholars point out that increased government spending on healthcare contributes to economic growth and that its overall impact is significant and positive, and therefore the government should emphasize financial investment in public healthcare services in order to promote sustainable and high-quality growth in the country's economy [3].

Much of the research that has been done analyzes the national level, and not enough attention has been paid to the differences between different regions. China is a large country, and there are large differences in the economic development of different regions and the level of healthcare services, medical insurance system, and the health status of residents in different regions, which will inevitably lead to regional differences in the relationship between healthcare expenditures and incomes. In view of this, this paper takes the healthcare expenditure and per capita disposable income of urban residents in China as the research object. Data for the years 2000-2022 were downloaded from the China Statistical Yearbook, and this panel data model was used to analyze the relationship between urban residents' healthcare expenditure and per capita disposable income in different regions and carry out the comparative analysis of regional differences. This paper finds that there are differences in the significance level and direction of influence in different regions. Specifically, in the Eastern and NorthEast regions, per capita disposable income has a significant positive impact on healthcare expenditure, in the Central region, the impact of per capita disposable income on healthcare expenditure is not significant, and in the Western region, per capita disposable income has a negative impact on healthcare expenditure, but the impact is not significant. The findings of this paper will provide a reference for the government to formulate regional differentiated medical security policies, promote the rational allocation of medical resources, improve the health of residents, and ultimately realize the sustainable development of medical security.

2. Data

The data on urban residents' healthcare expenditure and per capita disposable income in this study come from the China Statistical Yearbook, and the study period is from 2000 to 2022. The study included 31 provincial units in mainland China. This paper refers to official documents issued by the National Bureau of Statistics for the division of China's Eastern region, Central region, Western region, and NorthEast region. Due to the limitation of data acquisition, this paper only selected the data of urban residents for analysis.

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3. Research Methods

First of all, this paper carries out descriptive statistical analysis, calculates the mean, standard deviation and other statistics of residents' healthcare expenditure, and per capita disposable income in the four regions, and carries out comparative analysis.

Then, in order to explore the impact of per capita disposable income on healthcare expenditure, this study uses multiple linear regression analysis. The regression model is as follows:

$$\text{hcspend} = \beta_0 + \beta_1 \times \text{income} + \varepsilon \quad (1)$$

Where hcspend denotes urban residents' healthcare expenditure, income denotes per capita disposable income, is a constant term, is the coefficient of per capita disposable income, and is a random error term.

The focus of this paper is to analyze the differences between four different regions in China. The author estimates the above regression model in four regions, namely, the Eastern region, the Central region, the Western region, and the NorthEast region. Then, compare the regression results in different regions.

The regression results in the following section will focus on the positivity, negativity, and significance of the regression coefficients.

4. Results

4.1. Descriptive Statistics

Table 1: Descriptive Statistics of healthcare expenditure(hcspend) and Per Capita Disposable Income(income)

variable	N	mean	max	mean	sd
hcspend	713	1273.911	61797	1273.911	2407.257
income	713	23037.88	84034	23037.88	14921.04

Table 1 shows detailed information on different variables, such as income and hcspend.

First of all, this paper analyzes the descriptive statistics of urban residents' healthcare expenditure and per capita disposable income, which can provide a preliminary understanding of the characteristics of the main variables. The sample size of the data is 713, which is a large sample capacity, so the next regression results are representative. The mean value of urban residents' healthcare expenditures is RMB 1,273.911, the standard deviation is RMB 2,407.257, the minimum value is RMB 148.8, and the maximum value is RMB 61,797. The large standard deviation of the data indicates that there are large differences in the healthcare expenditures of urban residents. The maximum value of healthcare expenditure is much larger than the average value. The mean disposable income per capita of urban residents is RMB 23037.88, the standard deviation is RMB 14921.04, the minimum value is RMB 4724.11, and the maximum value is RMB 84,034. The standard deviation of per capita disposable income is greater than the standard deviation of health-care expenditure, indicating that there is also a great deal of variation in the level of residents' incomes.

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4.2. Regression Results

Table 2: Regression Results of healthcare expenditure on Per Capita Disposable Income in Different Regions of China.

Region	Variable	Coefficient	Standard Error	t-Statistic	p-value
Eastern	Per Capita Disposable Income (income)	0.0412 ***	0.0025	16.18	0.000
	Constant	-5.0166	142.5476	-0.04	0.972
	R-squared	0.8851			
	Adjusted R-squared	0.8723			
	Sample Size (N)	230			
	F-statistic	69.01 ***			
	P-value	0.000			
Central	Per Capita Disposable Income (income)	0.0019	0.0013	0.25	0.804
	Constant	31.0716	124.6629	0.25	0.804
	R-squared	0.9181			
	Adjusted R-squared	0.9016			
	Sample Size (N)	138			
	F-statistic	55.55 ***			
	P-value	0.000			
Western	Per Capita Disposable Income (income)	-0.1086	0.1311	-0.83	0.410
	Constant	87.5397	1499.313	0.06	0.953
	R-squared	0.1125			
	Adjusted R-squared	0.0315			
	Sample Size (N)	276			
	F-statistic	1.39			
	P-value	0.1152			
NorthEast	Per Capita Disposable Income (income)	0.0128 **	0.0054	2.26	0.029
	Constant	2.7346	94.3321	0.03	0.977
	R-squared	0.9808			
	Adjusted R-squared	0.9803			
	Sample Size (N)	69			
	F-statistic	152.00 ***			
	P-value	0.000			

*** p<0.01, ** p<0.05, * p<0.1

In the Eastern and NorthEast regions, disposable income per capita has a significant positive effect on healthcare expenditures. As the income level of the population increases, so does the healthcare expenditure (Table 2).

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In the Central region, per capita disposable income has a positive but insignificant effect on healthcare expenditure. The level of regional residents' income has little effect on healthcare expenditure (Table 2).

In the Western region, per capita disposable income has a negative effect on healthcare expenditure, and the effect is not significant (Table 2).

5. Conclusion

This paper analyzes the correlation between urban residents' healthcare expenditures and per capita disposable income in the Eastern, Central, Western, and NorthEast regions of China, and the results show that per capita disposable income has a significant impact on healthcare expenditures, but the level of significance and direction of the impact are different in different regions. Specifically, the Eastern and NorthEast regions show a significant positive correlation, the Central region has a non-significant impact, and the Western region shows a negative correlation, but the impact is not significant. Based on the regression results, this paper tries to analyze the reasons for such differences. This paper argues that due to their favorable geographic location and earlier development in history, the Eastern and NorthEast regions have a higher level of economic development, and the residents generally have higher income levels and pay more attention to healthcare. As China's economy develops, higher incomes drive higher healthcare expenditures. In the meantime, the rapid economic development will also lead to the development of medical resources, in the Eastern and NorthEast of China, there is an abundance of high-quality medical resources, and residents can more easily access to healthcare services, so the expenditure in this area will increase. However, in the Western region, economic development has been slow due to harsh environmental conditions. Although the per capita disposable income in the Western region has been increasing during 2000-2022, there is still a gap with the Eastern region, and the low income makes people spend more money on necessities, and the lack of healthcare resources in the Western region leads to less demand for healthcare. The impact of per capita disposable income on healthcare expenditure is not obvious, and even shows a negative correlation. The situation in the Central region is between the Eastern and the Western, and this paper speculates that it is because the Central region has been developing rapidly in recent years, and the income of the residents has increased, so naturally they have more money to spend on healthcare, but there is still a gap between the Central region and the Eastern region, so the positive correlation coefficient is not significant.

There are some limitations in this paper, due to the limitation of data acquisition, the data are only for urban residents, not including rural residents, so there are some limitations in the research results. Moreover, the choice of variables is more limited and fails to fully reflect all the factors affecting healthcare expenditures. In the future, the authors will consider adding more variables, such as health status, education level, number of medical institutions, etc., to construct a more complex model.

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