

Has SARS Changed Public Finance Health Spending?

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Abstract

The repeated outbreaks of public health security incidents in recent years have raised people's attention to the field of public health security. The outbreak of public health security incidents will inevitably have a certain impact on public health fiscal expenditures. However, there is still no definite answer about the specific impact of the impact on public fiscal health expenditures. This paper first takes the SARS outbreak as the impact of an exogenous event, and adopts the TREAT×POST research method commonly used in academia to explore the impact of the SARS outbreak on public financial health expenditure. Expenditures have increased. This article speculates that fiscal health expenditures may have received attention in the government's expenditure structure. In order to protect the safety of people's lives, the government has used more fiscal expenditures to fight the epidemic.

Keywords

SARS; Government public health expenditure; Public health security.

1. INTRODUCTION

In 2003, the SARS outbreak was a public health emergency, and the number of cases spread all over the provinces. From the first case confirmed on December 15, 2002 to August 7, 2003, there were a total of 5,327 confirmed cases nationwide. (Data sourced from WHO statistics). There are a total of 25 provinces with the number of cases, namely Beijing, Tianjin, Hubei, Chongqing, Sichuan, Guangdong, Jiangxi, Anhui, Fujian, Guangxi Zhuang Autonomous Region, Qinghai, Shanghai, Jiangsu Province, Zhejiang Province, Shandong Province, Shanxi Province, Hebei Province, Henan Province, Ningxia Hui Autonomous Region, Inner Mongolia Autonomous Region, Liaoning Province, Jilin Province, Gansu Province. There are a total of 6 provinces with no confirmed cases, namely Tibet Autonomous Region, Xinjiang Uygur Autonomous Region, Heilongjiang Province, Yunnan Province, Guizhou Province, and Hainan Province. The pressure on public health spending in the year of the outbreak was certainly not small. The first part of the article is arranged to review and summarize relevant literature and describe the background of the SARS outbreak. The second part is to describe the data sources and model settings. The third part is to analyze and test the robustness of the empirical results. The fourth part is the concluding remarks.

Some scholars have analyzed the problems existing in China's domestic fiscal health expenditure. Xu Yinzhou et al. (2004) believe that the author believes that the main problem of my country's fiscal public health expenditure structure is the unreasonable expenditure items. Affected by the market interest orientation, more financial input is invested in the hospital system with quick return of benefits, and less investment is made in the cause of health and epidemic prevention, which is difficult to see significant effects. Insufficient state. Affected by the drastic changes in the market-oriented income distribution pattern, the focus of grass-roots health and epidemic prevention work has shifted to various income-generating services. Health and epidemic prevention departments at all levels use public health facilities to provide market-

oriented services to raise funds and take the road of paid services. Avoiding the construction of the public epidemic prevention system is affected by the impact of departmental interests, which affects the ability of the health and epidemic prevention system to deal with major epidemics and emergencies. Liu Shangxi and Chen Shaoqiang (2003) believed that the ability of public finance to deal with public crises is insufficient, which is reflected in the following aspects. First, the function of the reserve fund is weak. It should be said that the setting of the reserve fund is an important part of the emergency response mechanism of public finance. But judging from the current situation, the setting of the reserve fund is simple, it is only a mobile financial resource, and there is no separate management mechanism. The foundation of the second emergency response capacity is weak, that is to say, there is a lack of a legal framework for risk cost sharing in government finance, such as between the central and local governments, between various government departments, between the government and the public, etc. How to share their risk costs in a crisis situation.

The cost of health care is also an important factor affecting the health expenditure of medical finance. Zhang Xin, Yang Lin (2020), whether to participate in medical insurance is an important factor affecting medical expenses, this is because medical insurance can hedge the risk of high medical burden, rationalize the low-asset holdings of the poor, and make the high-income class benefit. Wang Jun, Chen Gong (2007)'s definition of the content and caliber of public health expenditures is the starting point for the study of financial support for the development of health services. From the literal understanding of Chinese, public health expenditure can have two meanings: one is public health expenditure. The second is the expenditure on public health, that is, all expenditures by individuals, organizations, social groups or government departments in the field of public health. Yang Yujie et al. (2019) the proportion of public health institution expenses in total health expenses is low, only 3.44% in 2016; the financing of public health institutions is mainly borne by the government, but the financial subsidies of different types of institutions vary greatly; primary medical care The proportion of public health expenditure in health institutions is relatively low, and there is a significant gap with medical expenditure.

Some scholars have also explored the relationship between medical and financial health expenditures and residents' income through the spatial characteristics of health expenditures. Li Yuansheng, Xue Jing (2016) researched that my country's medical and health fiscal expenditures and residents' income show an uneven distribution in space, and the growth effect of medical and health fiscal expenditures on residents' income is obvious and has spatial spillover. The sub-regional estimation results show that the medical and health fiscal expenditures in the eastern coastal, northern and southern coastal areas have no significant effect on the growth of residents' income, while the medical and health financial expenditures in the underdeveloped areas such as the Great Northwest and Southwest have a significant effect on the growth of residents' income. In coastal areas, the middle reaches of the Yangtze River and the middle reaches of the Yellow River, and other regions with high economic correlation, medical and health fiscal expenditures have strong spatial spillovers on the growth of residents' income. Zhang Hongxiang, Zhang Mingzong, Xiong Bo (2014), based on the inter-provincial panel data in my country, and using econometric methods, discussed the impact of Chinese-style fiscal decentralization and government competition based on this on local government public health investment. The results show that: fiscal decentralization itself has a certain positive effect on local government public health expenditure, and the influence of government competition itself has regional heterogeneity differences. Local government public health spending creates negative incentives. Liu Jingzhang, Wang Jingjing (2015) used a restricted dependent variable model to study the factors affecting the efficiency of health expenditure, and found that factors such as fiscal decentralization, medical and health policies, urbanization level and economic development level were negatively correlated with health expenditure efficiency. Education level is positively correlated with it.

Based on the above theoretical logic, this paper empirically studies the relationship between the outbreak of SARS and the growth of medical, financial and health expenditures by using panel data of provincial medical fiscal expenditures in my country from 1997 to 2017. As a result, after the SARS outbreak, the medical, financial and health expenditures increased. The explanation given in this paper is that the local government has paid more attention to the public health prevention and control system after the SARS outbreak, which resulted in this result.

Compared with the existing literature, the innovation of this paper is reflected in the following aspects: First, the paper studies the impact of SARS on public health expenditure, which belongs to a classic topic of fiscal economics, and has a relationship between SARS and fiscal health expenditure. The topic is rarely discussed by scholars, and the article takes this as an entry point to conduct related research. Second, the article further explores how SARS affects public financial health expenditure by increasing the number of medical beds, medical and health institutions, medical technicians, and urban and rural population, providing a new perspective to explain the mechanism of changes in public health financial expenditure. Third, the outbreak of public health security incidents will inevitably have a certain impact on public health fiscal expenditures. However, there is still no definite answer to the specific impact of the impact on public fiscal health expenditures. The conclusions of the article may have some novelty. The research significance of this paper is mainly reflected in the following aspects: First, to study the impact of SARS on public financial health expenditure is conducive to enriching the content of the field of financial economics and enriching the existing research results. Second, the research in this paper is conducive to exploring the mechanism by which public health security events such as SARS affect public health fiscal expenditure, and enriches the existing theoretical mechanism. Third, the results obtained in this paper can provide certain policy recommendations for government health and public departments, and provide more theoretical suggestions.

2. METHODOLOGY

2.1. Empirical Mode

The outbreak of SARS provides a quasi-natural experiment for this article. Therefore, this part first constructs the idea of double difference estimation. Considering that the outbreak of SARS is not a natural experiment that changes with time, this paper adopts the traditional TREAT×POST model for empirical design. This paper studies the impact of SARS, a public health emergency, on public health fiscal expenditure. The model selected is the double-difference model that has been used by scholars in recent years. The model is set as follows:

$$y_{it} = \alpha + \mu_i + \lambda_t + \theta treat_i \times post_t + \beta X_{it} + \varepsilon_{it}$$

y_{it} is the explained variable, i ($i=1, \dots, N$) represents the individual, t ($t=1, \dots, N$) represents the time, μ_i is the individual fixed effect, λ_t is the time fixed effect, and θ is the coefficient we care about, which measures the policy estimation effect, X_{it} represents the control variable that changes with time and individuals, β is the coefficient of the control variable, and ε_{it} is the model error. $treat_i$ is a dummy variable of the treatment group. If the individual i belongs to the "treatment group" that has been impacted by the policy, the value is 1; if the individual i belongs to the "control group" that is not affected by the policy, the value is 0. $post_t$ is a dummy variable during the treatment period, and the individuals in the treatment group will not be affected by the policy until the treatment period (they have not been impacted before), if the individual i enters the treatment period, the value is 1; otherwise, the value is 0. Here in this article, the post value for the year before 2003 is 0, and the value for the year after 2003 is 1. The value of treat is 1 if there are SARS cases in the province, otherwise it is 0. The explained

variable is fiscal health expenditure. The explanatory variable y_{it} is replaced by med_expenditure.

2.2. Variables

Among them, the fiscal and health expenditure (10000 yuan) is represented by med_expenditure, the number of beds (10000) is represented by bed_numbers, the more the number of beds, the greater the medical and health expenditure; the number of medical technicians (10000) is medical_personnel to indicate that the larger the team of medical technicians, the greater the financial health expenditure of government departments; the number of health institutions (10,000) is represented by hospital_numbers; the fiscal expenditure at the end of the year (10,000 yuan) is represented by expenditure, and the year-end financial Expenditure as a reference object; the total population (10000 people) is represented by populations, and provinces with more population may also have larger medical expenditures; the total resident population (10000 people) is represented by pe_populations; urban population (10000 people) It is represented by urban_populations; the rural population (10,000 people) is represented by countryside_populations; the gross national product is represented by GDP (10,000 yuan) bigger.

2.3. Data Sources

This article uses the content of the statistical yearbook in CNKI to check the statistical yearbooks of various provinces (except Hong Kong and Macau), and finds data on medical and health expenditures, the number of medical beds, the number of medical and health institutions, and the number of medical technicians. There are many missing values in the data in the statistical yearbook. Some years have no data, and some provinces have missing data for one year, so I went to the China Health Statistical Yearbook to find relevant data to supplement. Regarding population data, comparative systematic data is found in the China Labor and Employment Statistics Yearbook (total resident population, rural population, urban population, male-to-female sex ratio). Finally, the data in this article also comes from a temporarily free and open EPS database platform. I found a lot of data in it. In summary, it has formed a time span of 22 years from 1996 to 2017, and the number of provinces has reached 31. Panel data.

3. RESULTS AND DISCUSSION

3.1. Basic Result

As shown in the following table, Table 1 mainly shows the regression results. Regression (1) is a regression that only adds the control variable of the number of beds. Regression (2) (3) (4) gradually adds the number of medical technicians and the number of medical institutions, the variable of the population of each province (take the logarithm), under the results of gradually adding control variables and adding fixed effects, the coefficient of Treat×Post is significantly positive, and the P value is significantly 0, which can pass the statistical significance level of 1%. test. The coefficient of Treat×Post is significantly positive, which shows that the outbreak of SARS has increased medical and financial health expenditures, which shows that local governments have realized the seriousness of the epidemic after the outbreak and increased local medical and health financial expenditures to deal with the epidemic to the people. harm to the masses. The estimated coefficient of the number of beds and technicians is positive, which shows that after the outbreak of the epidemic, the increase of the number of beds and technicians has significantly increased the government's medical and health expenditure.

Table 1. Demonstration of empirical results

Variable	(1) y_{it}	(2) y_{it}	(3) y_{it}	(4) y_{it}
Treat×Post	1.510*** (8.37)	1.499*** (7.71)	1.058*** (8.99)	0.716*** (6.28)
lnbed_numbers	1.721*** (4.02)	1.465** (2.18)	1.334** (2.19)	1.843*** (4.89)
lnmedical_personnel		0.272 (0.36)	-0.465 (-0.61)	-1.509** (-2.61)
lnhospital_numbers			0.828*** (5.40)	0.614*** (5.49)
lnpopulations				9.446*** (6.61)
Constant	8.354*** (9.32)	8.195*** (7.16)	10.728*** (8.34)	-63.201*** (-5.64)
Observations	682	682	678	678
R-squared	0.774	0.774	0.836	0.897
Number of state	31	31	31	31
state and Year FE	YES	YES	YES	YES

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

3.2. Robustness Test

In this paper, the proportion of medical and health expenditure to total financial expenditure is used to replace the explained variable for robustness test. The replaced explained variable is lnraio, where lnraio=ln(med_expenditure/expenditure). The regression results show that the coefficient of Treat×Post is still significantly positive when the control variables are gradually added, which enhances the stability of the results.

Table 2. Regression results of replacing explained variables

VARIABLES	(1) lnraio	(2) lnraio	(3) lnraio
Treat×Post	0.080** (2.46)	0.079** (2.48)	0.041 (1.28)
lnbed_numbers	0.030 (1.45)	0.280*** (4.97)	0.234*** (4.23)
lnmedical_personnel		-0.272*** (-4.76)	-0.280*** (-5.04)
lnhospital_numbers			0.097*** (5.70)
Constant	-2.891*** (-62.32)	-2.725*** (-47.45)	-2.550*** (-39.83)
Observations	682	682	678
R-squared	0.761	0.769	0.783
Number of state	31	31	31
state FE	YES	YES	YES

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

4. CONCLUSION

Since the founding of the People's Republic of China, the number of public health crises has also been relatively high. Recently, the new crown epidemic broke out in China. The impact of the new crown epidemic is more serious than that of SARS, which has brought a lot to the

country's economy and people's life safety. Challenges, the outbreak of SARS and the outbreak of the new crown epidemic also showed the inadequacy of government departments in the field of public health. Theoretically, this paper also raises the following questions: First, when the outbreak of the epidemic, the central government may allocate a certain amount of medical and health expenditure to the local finance in time, which may crowd out the local financial and health expenditure to a certain extent, causing the local government after 2003. Government spending on public health may decrease, but the empirical results in this paper do not suggest this. Second, SARS, as a catastrophic epidemic, may receive donations from all walks of life in some places, which may also crowd out government spending on public health. However, this paper uses the panel data of each province from 1997 to 2017, and empirically concludes that SARS Treat×Post affect the financial and health expenditure of local governments, and it has a significant positive effect, which shows the determination of the national government to safeguard the life safety of every citizen. This also shows the government's determination to strengthen security in the field of public health. The local government has not relaxed its vigilance in this regard after the assistance of the central government. This may also be the reason why the country was able to quickly and confidently control the epidemic in such a short period of time after the outbreak of the new crown epidemic this year. By linking the two events of the SARS outbreak and the outbreak of the new crown this year, it suggests that local governments should increase their financial investment in the field of public health, so as to better maintain social stability.

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