Study on the Factors Influencing Total Health Cost Based on Multiple Regression Model

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Abstract: In recent years, China's social economy and income level of residents have increased rapidly, the total cost of health has increased rapidly, and the level of medical expenditure of residents has been increasing. This paper establishes a multivariate linear regression model using data from 1996 to 2020, and analyzes several important influencing factors that affect overall health expenditure. The aim is to formulate a health financing policy suitable for the coordinated development of China's social economy, and to provide a basis for adapting to the needs of economic development, structural adjustment and institutional transformation.

Keywords: total cost of health, influencing factors, regression analysis

1. Build the data

| Year | Total health costs (100 million yuan) | Number of beds in health facilities (10,000) | Birth rate (‰) | Utilization rate of beds in township hospitals (%) |
|------|-------------------------------------|-----------------------------------------------|----------------|-----------------------------------------------|
| 1996 | 2709.42                             | 309.96                                        | 16.98          | 37                                            |
| 1997 | 3196.71                             | 313.45                                        | 16.57          | 34.5                                          |
| 1998 | 3678.72                             | 314.3                                         | 15.64          | 33.3                                          |
| 1999 | 4047.5                              | 315.9                                         | 14.64          | 32.8                                          |
| 2000 | 4586.63                             | 317.7                                         | 14.03          | 33.2                                          |
| 2001 | 5025.93                             | 320.12                                        | 13.38          | 31.3                                          |
| 2002 | 5790.03                             | 313.61                                        | 12.86          | 34.7                                          |
| 2003 | 6584.1                              | 316.4                                         | 12.41          | 36.2                                          |
| 2004 | 7590.29                             | 326.84                                        | 12.29          | 37.1                                          |
| 2005 | 8659.91                             | 336.75                                        | 12.4           | 37.7                                          |
| 2006 | 9843.34                             | 351.18                                        | 12.09          | 39.4                                          |
| 2007 | 11573.97                            | 370.11                                        | 12.1           | 48.4                                          |
| 2008 | 14535.4                             | 403.87                                        | 12.14          | 55.8                                          |
| 2009 | 17541.92                            | 441.66                                        | 11.95          | 60.7                                          |
| 2010 | 19980.39                            | 478.68                                        | 11.9           | 59                                             |
| 2011 | 24345.91                            | 515.99                                        | 11.93          | 58.1                                          |
| 2012 | 28119                               | 572.48                                        | 12.1           | 62.1                                          |
| 2013 | 31668.95                            | 618.19                                        | 12.08          | 62.8                                          |
| 2014 | 35312.4                             | 660.12                                        | 12.37          | 60.5                                          |
| 2015 | 40974.64                            | 701.52                                        | 12.07          | 59.9                                          |
| 2016 | 46344.88                            | 741.05                                        | 12.95          | 60.6                                          |
| 2017 | 52598.28                            | 794.03                                        | 12.43          | 61.3                                          |
| 2018 | 59121.91                            | 840.40                                        | 10.86          | 59.6                                          |
| 2019 | 65841.39                            | 880.70                                        | 10.41          | 57.5                                          |
| 2020 | 72306.40                            | 910.10                                        | 8.5            | 53.6                                          |

Source: China Statistical Yearbook (1996-2020), official website of the China Bureau of Statistics
2. Regression analysis

In the SPSS software, using the multi-linear regression model for analysis, the original data is linearly regressed in all 3 arguments in SPSS, and the output result is as Table 2.

As can be seen from the table of direct regression coefficients, the number of beds in health institutions, the birth rate of the population and the utilization rate of the beds in township hospitals are all less than 10, which is explains that there is no significant multiple collinearity between them.

Table 2. Table of direct regression coefficientsa

| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | Collinearity Statistics |
|-------|-----------------------------|----------------------------|---|------|-------------------------|
|       | B  | Std. Error | Beta |     | Tolerance | VIF |
| 1     | (Constant) | -12616.504 | 3597.132 | -5.719 | .003 |                         |
| X1, Number of beds in health facilities (10,000) | 96.370 | 3.082 | 1.016 | 36.776 | .000 | .256 | 3.907 |
| X2, Birth Rate (%) | -726.813 | 207.392 | -.073 | -6.833 | .003 | .626 | 1.597 |
| X3, Utilization rate of beds in township hospitals (%) | -73.906 | 44.247 | -.061 | 1.43 | .112 | .204 | 4.891 |

a. Variable: Total health costs Y (100 million yuan)

Table 3. Table of ANOVAa

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|-------|----------------|----|-------------|---|------|
| 1     | Regression     | 4.924E9 | 2 | 2.462E9 | 1.682E3 | .000a |
|       | Residual       | 2.782E7 | 19 | 1464087.912 | | |
| Total |                | 4.952E9 | 21 | | | |

a. Predictors: (Constant), X2 Birth rate (per thousand), X1 Number of beds in health facilities (10,000)
b. Dependent Variable: Total health costs Y (100 million yuan)

As can be seen from Table 3, F is 1.682E3 and the P value is close to 0, indicating that the regression equation is significant, and that the number of beds in health facilities and the birth rate have a significant linear effect on the total cost of health.

\[ Y = -16347.335 + 92.114 x_1 - 562.073 x_2 \]

3. Policy recommendations

Based on the results of the above regression analysis, the following recommendations are made.

3.1 Raise the level of economic development and coordinate the relationship between individuals and society

Total health cost financing and the affordability of the composition affecting economic development, the development of health care and the disease economy burden, if the individual resident's health expenditure is too high will increase the economic burden of the resident's disease, resulting in "expensive medical care" and "causes". Disease leads to poverty, "the problem, without universal health then there will be no comprehensive (well-off. Socially, with the reform of China's financial system and medical and health system, the allocation of medical and health resources is gradually becoming more and more (commercial and market-oriented China's supply entities are pursuing market interests, and their dependence on market demand is gradually increasing. On the other hand, health services have gradually evolved into private goods, leading to the gradual withdrawal of government and social resources investment from the dominant position, and the gradual increase in individual health expenditure the important component of health expenditure, which is when the proportion of personal health expenditure gradually decreases and the proportion of social health expenditure gradually increases. It shows that social groups, charities and some social health institutions are helping residents with their medical services it has played a role in reducing the pressure on some residents to pay for health care, and the level of per capita funding has increased. The
3.2 Improve the level of health financing and optimize the allocation and use of health costs

On the one hand, China is facing a new economic normal, maintaining economic growth and appropriately expanding its fiscal deficit in stages. To raise the level of total health expenditure, on the other hand, to optimize the structure of government and social health expenditure, increase government health insurance expenditure and social health expenditure, social health insurance expenditure. The structure of social health expenditure in social health expenditure also needs to be optimized. The growth of the total population will undoubtedly lead to the consumption of various resources, health and health care resources will inevitably increase, and thus lead to. The increase in the total cost of health, now the level of medical care in our society is slowly improving, a variety of diseases that were previously incurable. (Most are now treatable and become common diseases that can be cured by surgery and medication, and most residents typically spend more on health care.)

3.3 Continue to increase government investment in health and promote China's health construction

China is in the final stage of building a well-off society in an all-round way and deepening medical reform, however, there is still a big gap between the level of health invested by the Chinese government and the developed countries of the world, in accordance with the "one outline, two plans" proposed "to establish results-oriented health input mechanism", "to establish a fair and effective sustainable financing system" under the requirements of the goal, whether now or in the future every period must be We will continue to increase the direction of government investment in health, promote the medical reform, a project that the people attach great importance to, and take important measures on the economy, all of which contribute to the construction of a healthy China.

3.4 Take preventive measures in a timely manner to (avoid the rapid growth of health costs

China’s comprehensive strength in all aspects is constantly increasing, and the city is constantly developing. In terms of population, the number of young people is decreasing and the number of elderly people is increasing. The types of people's illnesses are also constantly changing. In the future, social health expenditures must increase unabated. In order to promote the steady and reasonable growth of health expenditures and ensure the realization of the goals of medical reform and cost control, a scientific prevention and detection system must be established. We must always pay attention to the development of health expenditure and improve the governance level of health development. Time should be adjusted according to the situation in a timely manner. At the same time, it is not possible to unilaterally pursue the maximization of benefits to cause excessive increase in health expenses, and not to make urban and rural people feel an excessive economic burden.

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