Application of System Dynamics Model in Control of Over-Increasing Medical Care Expenditure

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Abstracts Objective Nowadays rising health costs make many families facing economic distress, and the difficulty of getting medical treatment becomes a prominent social problem in China. The present study aimed to provide constructive reference and the feasibility of approach to reduce medical expense burden and solve the problem of the difficulty in seeing a doctor and the high cost of getting a treatment. **Methods** Qualitative and quantitative mechanism models of over-increasing medical care expenditure were applied to demonstrate the formation mechanism. Modeling technique of system dynamics was utilized to construct SD model and build policy experiment platform of medical care expenditure system. The data used in the study was collected mainly from official statistics, such as China Statistical Yearbook, China Population Statistics Yearbook and health accounts funding information. **Results** The final professional model which was accepted and reasonable on fitting index was confirmed by professional and prior experience model and model modification indices. It was founded that the course of over-increasing medical care expenditure was controlled by the intrinsic properties. The financial and commodity prices bore the primary responsibility which account for 40.0%-71.6% and 40.8%-66.7% or more separately. The change of fee per time caused by financial investment adjustment was 1.03-2.38 times more than medical insurance function, while the effect of yield change was 1.18-1.42 times as great. Strategies, such as increasing the government investment or bumping up business income yield, could effectively control the rapid increase of the medical expense. Total operating revenue would fall by almost a quarter compared with the same period in 2015 through optimization strategy. Result showed that not only operating revenue could be saved, but also 17.4 to 53.4 percent of fee per time could be saved. **Conclusions** System dynamics model analysis could simulate the dynamics of medical care expenditure system. The high speed growth and its damage in the absence of government intervention were revealed by means of predicting the future development of medical expense. Strategies such as increasing the government investment or bumping up business income yield could effectively control the rapid increase of the medical expense by policy intervention experiment in this study. The results verified that it is of good feasibility and practicability of system dynamics model analysis in the study of medical care expenditure.

Key words: Health costs, Mechanism, Control, System dynamics