

Structural Analysis of the Factors Associated with Increase in Health Expenditures for the Aged in Japan

Shinya Matsuda¹⁾, Yoshihisa Fujino¹⁾, Kiyohide Fushimi²⁾, Kenji Fujimori³⁾

¹⁾Department of Preventive Medicine and Community Health, University of Occupational and Environmental Health

²⁾Department of Health Policy and Informatics, Tokyo Medical and Dental University Graduate School of Medicine

³⁾Division of Medical Management, Hokkaido University Hospital

Abstract

In order to formulate practical indications for the future Japanese health reform programs, we have conducted a structural analysis of the factors associated with increase in health expenditures for the aged based on the claim data of National Health Insurance (NHS) scheme of one local government, Kyushu, Japan. Total Health Care Expenditures (THCE) of this city increased 5.00% between 2000 and 2001, of which 5.64 % was due to the increase of aged insured, and on the contrary per capita Health Care Expenditures (pHCE) showed negative contribution; -0.64%. For changes in the three factors of pHCE, utilization rate and day per case decreased -1.00% and -2.73% respectively, and on the contrary expenditures per day increased 2.96%. The present analysis has indicated that the rapid ageing of the Japanese society is the most important factor for increase of THCE. In order to realize a healthy aged society and to make our system sustainable, one of the possible solutions is to strengthen the health promotion program. It is expected that the newly introduced national health promotion program from 2008 will contribute to the development of healthy aged society.

Key words: health expenditures, aged society, health promotion, Japan

❖ Introduction

Along with the ageing of the society where disease structures have changed from acute to chronic diseases dominant pattern, the health care expenditures (HCE) of Japan has been increasing. In 2004 the medical expenditures have become over 32 trillion yen, and then continue to increase 1 trillion yen per year. So far as the percentage of HCE per GDP is concerned, Japan consumes about 8% of GDP for health

care¹⁾. This figure is relatively small compared with other OECD countries²⁾.

Considering the rapid ageing of society and low-economic development, however, it is an urgent task for the Japanese government to reform the health system. According to the forecasting of Ministry of Health, Labor and Welfare (MHLW), total health expenditures will be 67 trillion yen in 2037. Of which 67% will be due to health expenditures of the aged population more than 65 years old³⁾.

In order to formulate practical indications for the future health reform programs, we have tried a structural analysis of the factors associated with increase in health expenditures for the aged based on the claim data of National Health Insurance scheme¹⁾ of one local government of Kyushu Island.

Received: December 3, 2007

Accepted: December 17, 2007

Correspondence: S. Matsuda, Department of Preventive Medicine and Community Health, School of Medicine, University of Occupational and Environmental Health, 1-1 Iseigaoka, Yahata-nishi-ku, Kitakyushu, Fukuoka 807-8555, Japan
e-mail: smatsuda@med.uoeh-u.ac.jp

❖ Material and Methods

Materials

Data are the aggregated claim data of National Health Insurance of one local government of Kyushu islands. Every year the prefecture union of NHS publishes the detailed aggregated data of NHS claims. In this dataset, utilization rate, HCE per person are described by age category, sex and disease classification.

We obtained 2000 and 2001 dataset from the local government for the analysis.

Methods

Per capita HCE (pHCE) can be decomposed into the following three factors; utilization rate (UR), days per case (DPC), expenditures per day (EPD), as following.

$$\text{pHCE} = \text{UR} \times \text{DPC} \times \text{EPD} \quad (\text{Formula 1})$$

By differentiating this formula with respect to time (t), we obtain the following formula;

$$\begin{aligned} \text{dpHCE/pHCE} \\ = \text{dUR/UR} + \text{dDPC/DPC} + \text{dEPD/EPD} \end{aligned} \quad (\text{Formula 2})$$

For the total health care expenditures (THCE), the following formula is given.

$$\text{THCE} = \text{N} \times \text{pHCE},$$

where N represents the number of assured.

By differentiating this formula with respect to time (t), we obtain the following formula;

$$\begin{aligned} \text{dTHCE/THCE} \\ = \text{dN/N} + \text{dpHCE/pHCE} \\ = \text{dN/N} + \text{dUR/UR} + \text{dDPC/DPC} + \text{dEPD/EPD} \end{aligned} \quad (\text{Formula 3})$$

In this way we can decompose the increase of THCE into that of number of assured and per capita HCE.

Using these formulas we have conducted a structural analysis of the factors associated with increase in health expenditures for the aged based on the claim data of National Health Insurance scheme of one local government of Kyushu Island between 2000 and 2001.

❖ Results

Table 1 shows the results. THCE of this city increased 5.00% between 2000 and 2001, of which 5.64% was due to the increase of aged insured, and on the contrary pHCE showed negative contribution; -0.64%.

For changes in the three factors of pHCE, UR and DPC decreased -1.00% and -2.73% respectively, and on the contrary EPD increased 2.96%.

For in-patient services, THCE increased 6.08%, of which 5.64% was due to the increase of insured, and 0.38% was due to increase in pHCE. For the three components, UR and DPC decreased -0.88% and -0.52% respectively, and on the contrary EPD increased 1.79%.

For out-patient services, THCE increased 2.92%, of which 5.64% was due to the increase of insured, and on the contrary pHCE showed negative contribution; -2.61%. For the three components, UR and DPC decreased -1.04% and -3.65% respectively, and on the contrary EPD increased 2.34%.

These results indicate that the major factor of increase in THCE of this city is the increase of aged population and that the most important strategy to regulate the increase in THCE is to control the pHCE.

❖ Discussion

The present analysis has indicated that the rapid ageing of the Japanese society is the most important factor for increase in THCE. Some of the previous literatures denied the direct effect of ageing on the increase in THCE^{4,5}. They indicated that the advance in medical technology is the most important factor for the increase in medical expenditures.

The increase of aged population means the increase of patients who need medical care. Along with the ageing of the society, the number of patients with cancer, cardio-vascular diseases and other life-style related diseases has been increasing. The recent advance in medical technology has made it possible to save the lives of acute patients, such as AMI and stroke patients. As a result, such patients require acute medical care services and then following chronic care services. This situation naturally expands medical expenditures. In this meaning, the advance in medical technology is another important factor for the increase in THCE, as indicated by Yu⁵.

Table 1 Results of structural analysis of factors associated with increase in the health expenditures for the aged (Data from a National Health Insurance of K city in Kyushu island, 2000 and 2001)

Total						
	THCE	N of insured	HCE	UR	DPC	EPD
2000 (1)	45,454,487,937	47,823	955,147	1,910	4.39	9,815
2001 (2)	47,727,027,417	50,518	949,017	1,891	4.27	10,106
difference (2)–(1): (3)	2,272,539,480	2,695	–6,130	–19	–0.12	291
(3)/(1) (%)	5.00	5.64	–0.64	–1.00	–2.73	2.96
In-patient						
	THCE	N of insured	HCE	UR	DPC	EPD
2000 (1)	22,231,413,655	47,823	467,154	118	21.26	18,610
2001 (2)	23,582,480,219	50,518	468,920	117	21.15	18,943
difference (2)–(1): (3)	1,351,066,564	2,695	1,766	–1	–0.11	333
(3)/(1) (%)	6.08	5.64	0.38	–0.88	–0.52	1.79
Out-patient						
	THCE	N of insured	HCE	UR	DPC	EPD
2000 (1)	15,534,760,129	47,823	326,436	1,656	3.29	5,987
2001 (2)	15,988,528,846	50,518	317,920	1,639	3.17	6,127
difference (2)–(1): (3)	453,768,717	2,695	–8,516	–17	–0.12	140
(3)/(1) (%)	2.92	5.64	–2.61	–1.04	–3.65	2.34

THCE: Total Health Care Expenditures; N: Number; HCE: Health Care Expenditures per capita; UR: Utilization rate; DPC: Days per Case; EPD: Expenditures per day.

Social change of the Japanese mentality is also an important factor of increase in THCE. The generalization of consumerism among the citizens is such a factor. Along with informatization of society, the patients can easily obtain the information on the “best practice” of care. Mass-media facilitates this consumerism in medical care services. Under this situation, patients have become to require the highest level of treatment as possible. Sometimes the requirement of patient seems to be unrealistic. Anyway this situation inflates THCE. Strictly speaking, it is difficult to separate the effect of ageing, advance in medical technology and expansion of consumerism, as the aged with sense of strong consumerism is increasing.

Thus it becomes an urgent task how to balance the quality of care and control of THCE. One possible solution is disease management. DMAA defines the Disease Management as follows⁶⁾:

“Disease management is a system of coordinated health care interventions and communications for populations with conditions in which patient self-care

efforts are significant.”

In order to realize a healthy aged society, the Japanese government has established a new law for the health promotion in 2006. The new law will make “the specified health checkup and intervention program” for insured over 40 years old obligatory for public health insurers from April, 2008⁷⁾. All public health insurers have to organize health check-up and the following health promotion programs for the insured over 40 years old. The main target of screening is “Metabolic syndrome”. The insured will be categorized into one of three levels according to their risk level; active support required, giving incentive required, only information required. If an insured is evaluated as active support required or giving incentive required, he/she must follow a standardized disease management program that is offered by the health support organization contracted with the insurers. The health support organization is a health institution that offers disease management services.

However, it is uncertain if the disease manage-

ment program will reduce THCE. If the government want to reduce the health expenditures, as Ham suggested⁸⁾, more direct method might be necessary, such as capitation and global budgeting.

Another solution to control the increase of THCE is substitution. This strategy is to substitute traditional medical services by other type of cheaper services, for example, from institutional services to home care services, form hospital to assisted living.

As the Japanese social insurance scheme is based on the transfer of money from young to old generation, the rapid ageing make it difficult to maintain the system. In order to make the system sustainable, it is indispensable to increase the working population. The Japanese elderly are highly motivated to work and the actual employment rate among the elderly is very high compared with other developed countries. According to official statistics of 1998⁸⁾, 74.8% of men of age 60 to 64, 35.9% of men of age 65 and more, 40.1% of women of age 60 to 64, and 15.2% of women of age 65 and more, were working in 1998.

Economic needs are not the only reason for the elderly to work. According to the survey conducted by MHLW⁹⁾, about fifty percent of the elderly replied that they wanted to work in order to maintain their health and to have fulfilment in life. In most of the cases, companies set the retirement age between 60 and 65 years old. According to the survey conducted by the government¹⁰⁾, more than 80% of men in working age responded that the ideal retirement age is 65 years and older.

As we expect the aging society with fewer children to progress and the young population to decrease, it is essential for the Japanese society to utilize the experience and skills of the elderly in order to maintain the vitality of the society. It is well known that the health status is one of the important factor to make it possible for the elderly to continue to work¹¹⁾.

Disease management program might make it possible for the Japanese aged to continue to work as long as possible, which will increase the income and reduce the payment of social security fund. We consider this indirect effect of health promotion on the financial situation of social security will be more important than the direct effect to reduce medical care cost.

As our present result has suggested, the rapid ageing will increase the total health expenditures. In order to make the Japanese health system sustainable, we have to implement really effective countermea-

asures within the coming few years. The 2006 Health reform is a kind of touchstone for the future of Japanese health system.

Up to now, there is no evidence to support our optimistic hypothesis. We regards the new health promotion program from 2008 as a social experimentation.

◆ Acknowledgement

This study was conducted by the support from PPPI (Program on Pharmaceutical Policy Issue) grant of the Merck Company Foundation in 2006.

◆ References

- 1) Ministry of Health, Labor and Welfare: Report on health care expenditures 2004 (2006) (in Japanese).
- 2) OECD: OECD health data 2005, Paris: OECD, 2006.
- 3) Ministry of Health, Labor and Welfare: Forecasting of future health care expenditures (2002).
- 4) Lubitz J, Liming C, Kramarow E, et al.: Health, Life expectancy, and health care spending among the elderly. *NEJM*, 49: 1048–1055 (2003).
- 5) Yoo BK: Health Economics for “Reform”. Osaka: MC Medica Shuppan, 2006 (in Japanese).
- 6) Disease Management Association of America: http://dmaa.org/dm_definition.asp (November 15, 2007).
- 7) Matsuda S: Health promotion policy in Japan. *APJDM* 1 (1): 11–17 (2007).
- 8) Ham C: Health Care Reform: Learning from International Experience. Buckingham: Open University Press, 1997.
- 9) Ministry of Labor: Survey on Employment Conditions of Persons. 1996 (in Japanese).
- 10) Management and Coordination Agency: Elderly People’s Life and Awareness. 1996 (in Japanese).
- 11) Seike A, Yamada A: Economics of the Elderly Working (Korei-sya syugyo no keizai-gaku). Tokyo: Nihon Keizai Shinbun-sya, 2004 (in Japanese).

◆ Note

1. Japan’s universal health insurance system, which covers the country’s 122 million population, is segmented according to workplace and living place. The type of company one works for determines the

insurance society to which one belongs and the financial contributions one must make. The health insurance scheme is categorized into three basic groups according to age and employment status; Employee's Medical Insurance scheme (EMI) for employers and their dependants, National Health

Insurance scheme (NHI) for self-employed, farmers, retired and their dependent, and a special pooling fund for the elderly. Each municipality (or their association) organizes its NHI fund and gathers a premium from the insured.