

CHAPTER 6

CONCLUSIONS AND POLICY IMPLICATION

This chapter shows the summary of the determinants of Total Health Expenditure for Elderly and Total Long-term Care Expenditure using the results of each independent variable. Then the difference of the determinants of THEE and TLTCCE was described by all prefectural model and two-grouped model which was classified by health status. Finally, possible policy implications from these results are presented.

6.1 Summary of the Evaluation of Each Independent Variable

1. Doctors

According to the correlation matrix, the number of doctors per one hundred thousand population has significant positive correlation with all expenditures. According to the multiple regression analysis, this variable was selected as a positive determinant for TLTCCE in the model of all prefectures, and as a positive determinant for outpatient care expenditure in the model of the higher life expectancy group. Capacity of medical schools was reduced following the estimation conducted by MoHLW in 1998 that doctors outnumber demand. The reduction of the number of doctors will contribute to the reduction of the outpatient care expenditure in the higher life expectancy group.

2. Clinics

From the result of the correlation matrix, the number of clinics per one hundred thousand population has significant positive correlation with outpatient care expenditure and home care expenditure. For the multiple regression analysis, this variable was selected as a positive determinant for outpatient care expenditure in the model of all prefectures and in the model of the longer life expectancy group. The control of the number of clinic is difficult in Japan because almost all clinics are from the private sector; two possible ways to control the number of clinics are to control the number of doctors or to increase the rate of doctors who work at hospitals.

3. Hospitals

The number of hospitals per one hundred thousand population was seriously correlated with the number of beds per one hundred thousand populations. The variable for hospitals was not used in this study, because the number of beds well explains the dependent variables better than the number of hospitals.

4. General Beds

From the result of the correlation matrix, the number of beds per one hundred thousand populations had significant positive correlation with inpatient care expenditure and long-term care expenditure at nursing facilities. According to the results of the multiple regression models, general bed was selected as the determinant of Total Health Expenditure for Elderly, inpatient care expenditure and long-term care expenditure at nursing facilities in the model for all prefectures. This variable was selected as the positive determinant of inpatient care expenditure and long-term care expenditure at nursing facilities in the model for the longer life expectancy group. For the model of shorter life expectancy group, the number of general beds was selected as the positive determinants of inpatient care expenditure, Total Long-term Care Expenditure and long-term care expenditure at nursing facilities. The standardized coefficient of this variable to inpatient care expenditure in the model for longer life expectancy group is more than one. Therefore, controlling the number of beds is one of the most important ways to control the inpatient care expenditure. The number of beds per one thousand populations is higher than those in other OECD countries. The number of beds per one thousand populations in Japan is 14.7, while that of the United States is 3.6, that of the UK is 4.1 and that of Germany is 9.3 (Health Insurance System Study Group, 2002).

5. Sanatorium Type Beds

According to the simple correlation, sanatorium type beds per one thousand elderly populations had significant positive correlation with Total Health Expenditure for Elderly, inpatient care expenditure, Total Long-term Care Expenditure and long-term care expenditure at nursing facilities. From the multiple regression models, this variable was selected as the determinant for the outpatient care expenditure as well as inpatient care expenditure and long-term care expenditure at nursing facilities. Sanatorium type beds are not utilized for outpatient care services. The number of sanatorium type beds per one thousand elderly populations and the number of hospitals per one hundred thousand populations have high

correlation, because most sanatorium type beds were transferred from general beds to sanatorium beds at hospitals. As Japan's health service providers are not well categorized by function, hospitals function for outpatient care in the same way as clinics. Therefore, the number of sanatorium type beds was selected in the multiple regression model as the independent variable because of spurious correlations by confounding factors (the number of hospitals per one hundred thousand population).

6. Health Services Facilities for the Aged

According to the correlation matrix, Health Service Facilities for the Aged has significant positive correlation with inpatient care expenditure and long-term care expenditure at nursing facilities. This implies that the function of HSF is to act as a bridge between inpatient care and long-term care at nursing facilities or at home. For the multiple regression model, Health Service Facilities for the Aged was selected as a positive determinant of inpatient care expenditure in the model for all prefectures and both the longer and shorter life expectancy group.

7. Special Nursing Homes

According to the correlation matrix, Special Nursing Homes has significant positive correlation with Total Health Expenditure for Elderly, inpatient care expenditure, Total Long-term Care Expenditure, and long-term care expenditure at nursing facilities and at homes. Special Nursing Homes was selected as the positive determinant of Total Long-term Care Expenditure and long-term care at nursing facilities. This variable was selected as the negative determinant of outpatient care expenditure in the model for all prefectures and shorter life expectancy group.

8. Home-helpers

The number of home-helpers was selected as the chief determinant of the long-term care expenditure at home in the model of all prefectures and the model for both the longer and shorter life expectancy group. This variable was selected as the negative determinant of long-term care expenditure at nursing facilities. It implies that home care replace the facility care if the supply of home helpers are enough and the health status in the prefecture is relatively better (in longer life expectancy group).

9. Rate of Elderly Living Alone

Before conducting this study, rate of elderly living alone was considered as the variable which means the unavailability of home care by family members. Therefore, the expected sign was positive to Total Health Expenditure for Elderly, inpatient care expenditure, Total Long-term Care Expenditure and long-term care expenditure at home. However, elderly who can live alone are relatively healthier than other elderly in hospitals, nursing facilities, or living with family care. Therefore, this variable was selected as the negative determinant for inpatient care with all prefecture models and with the data of higher life expectancy group.

10. Home Ownership

The rate of home ownership was selected as the negative determinant of Total Health Expenditure for Elderly and inpatient care expenditure in the model with all prefecture data and in the model for the longer life expectancy group. This variable was also selected as the negative determinant of long-term care expenditure at nursing facilities. Therefore, this variable would be a key factor for cost containment of Total Health Expenditure for Elderly.

11. Average Floor Space of the Houses

Average floor space of the houses was selected as the negative determinant of the long-term care expenditure at home in the model with longer life expectancy group. This variable was also selected as the positive determinant of long-term care expenditure at nursing facilities with the model of the shorter life expectancy group.

12. Average Disposable Income

Average disposable income was selected as the negative determinant of home care expenditure with the model for all prefectures and the shorter life expectancy group. However, this variable was a positive determinant for the outpatient care expenditure with the model of the longer life expectancy group.

13. Life Expectancy at 70 Years of Age for Males

Life Expectancy at 70 years of age for males was selected as the negative determinant for the Total Health Expenditure for Elderly in the model for the longer life expectancy group.

14. Life Expectancy at 70 Years of Age for Females

Life Expectancy at 70 years of age for females was selected as an negative determinant for the Total Health Expenditure for Elderly in the model for both the longer and shorter life expectancy group. This variable was selected as the negative determinant of inpatient care expenditure in the model for all prefectures. This variable shows the health status of the majority of elderly.

15(a). The Rate of Upper Elderly in Roken Eligible Citizens

The rate of upper elderly in Roken eligible citizens was selected as the negative determinant for outpatient care expenditure in the model of the longer life expectancy group. This variable was selected as the positive determinant of inpatient care expenditure for the model for the shorter life expectancy group. Although the aging of the total population has been considered as the significant determinant for the increase of Total Health Expenditure, the aging amongst the elderly population does not affect so much the Total Health Expenditure for Elderly and Total Long-term Care Expenditure.

15(b). The Rate of Upper Elderly in LTC insured

The rate of upper elderly in LTC insured was selected as the positive determinant for home care service in the model for the longer life expectancy group.

6.2 Conclusions from the Results of the Model with All Prefectural Data and Two-grouped Data

This study has clarified the key determinants of Total Health Expenditure for Elderly, inpatient care expenditure for elderly, outpatient care expenditure for elderly, Total Long-term Care Expenditure, long-term care expenditure at nursing facilities and at home through multiple regression models. Furthermore, through the grouping classified by health status, the differences of the determinants of Total Health Expenditure for Elderly and Total Long-term Care Expenditure between the higher and lower group were revealed. This section summarizes the results of the all prefectural model and two-grouped model and proposes possible policy options for cost-containment policy. Summary of the results are presented in Table 6.1.

6.2.1 Conclusions from the Models with All Prefectural Data

(a) Determinants of Total Health Expenditure for Elderly

The main determinant for the increase of Total Health Expenditure for Elderly and inpatient care expenditure for elderly was the number of general beds. The key factors that decrease the Total Health Expenditure for Elderly was the rate of home ownership (which indicates the availability of home care). Life expectancy at 70 years of age for males, which reduces the time for females to live alone, effectually decreases the Total Health Expenditure for Elderly in the model for all prefectures. The key factors that decreases inpatient care expenditure for elderly were the rate of elderly living alone as well as the home ownership. Before this estimation, elderly living alone was selected as the variable that increases inpatient care expenditure for elderly and long-term care expenditure at nursing facilities because it might indicate the unavailability of home care by family members. However, the result of the OLS estimates showed that elderly living alone were relatively healthier people because they can live alone.

(b) Determinants of Total Long-term Care Expenditure

The key determinants for increasing Total Long-term Care Expenditure were the three types of nursing facilities (including the number of sanatorium type beds, Special Nursing Homes and Health Services Facilities for the Aged), as well as the number of doctors. A determinant for decreasing Total Long-term Care Expenditure was not selected in this model. This model well explained Total Long-term Care Expenditure: R bar square was as high as 0.966. Since the implementation period for Long-term Care Insurance, the number of nursing facilities (especially the number of sanatorium type beds) showed large gaps between the prefectures with many sanatorium type beds and those with fewer.³⁸ Sanatorium type beds are well equipped with medical personnel and facilities. Therefore, the difference in the number of sanatorium type beds directly affects the difference of the per capita Total Long-term Care Expenditure in each prefecture.

³⁸ The gap between the per capita number of sanatorium type beds in the highest prefecture and that in the lowest prefecture was 17 times in 2000.

(b) Comparison of the Determinants between THEE and TLTCE

When comparing Total Health Expenditure for Elderly and Total Long-term Care Expenditure, the insurers of Long-term Care Insurance (municipalities) have more control over the supply of services than do insurers of Health Insurance. Therefore, it is easier for the insurers of Long-term Care Insurance to control the factors that increase expenditures. However, for the factors that decrease the Total Long-term Care Expenditure, only one variable (income) was selected in the model. This variable is not easily controlled. Therefore, the effective measure for controlling Total Long-term Care Expenditure is the decisions made in each municipality regarding the supply of the facility services in that municipality.

6.2.2 Conclusions from the Models with Two-grouped Data

(a) Determinants of Total Health Expenditure for Elderly

The key positive determinants for Total Health Expenditure for Elderly were sanatorium type beds in the higher life expectancy group, and the number of home-helpers and the number of sanatorium type beds in the lower life expectancy group. The key negative determinants for Total Health Expenditure for Elderly were life expectancy at 70 years of age for females and the rate of home ownership in the model for both the higher and lower life expectancy group. The number of general beds determines the total health expenditure for elderly, because the number of general beds is more than the number of sanatorium type beds. Therefore, it might be a spurious correlation with the confounding factor being general beds, because sanatorium type beds were transferred more from general beds in the prefectures which had an abundance of general beds. Life expectancy at 70 years of age for females was selected as the determinant which decreases the Total Health Expenditure for Elderly in both groups, because this variable implies the health status of females, which is a majority of the elderly.

In regard to the inpatient care expenditure for elderly, the number of general beds was the major positive determinant in the model for the higher life expectancy group. The coefficient was more than one. This indicates that a reduction in the number of general beds is

The rate of elderly living alone and the rate of home ownership, which indicates the availability of home care, were also the negative determinants in the model for the higher life expectancy group. The number of home-helpers and the rate of upper elderly in Roken eligible citizens as well as the number of general beds and sanatorium type beds were determinants which increase the inpatient care expenditure for elderly in the model for the lower life expectancy group. The number of clinics was selected as the determinant which decreases the inpatient care expenditure for elderly. The abundance of clinics, the free access system, and low co-payments lead to a higher outpatient visit rate of elderly in Japan, but this may alleviate the high cost of hospitalization and surgeries through frequent check ups and treatments in the early stages of diseases.

With regard to outpatient care expenditure, the number of doctors was selected in the higher life expectancy group, and the number of clinics and average disposable income were selected in the lower life expectancy group as a determinant for the increase of this expenditure. The reason why the number of doctors was the determinant for outpatient care expenditure was because hospitals offer outpatient services as well as inpatient services in Japan. The number of doctors means the doctors working in hospitals as well as in clinics. The separation of function of medical facilities is not well organized in Japan. Therefore, hospitals have been accepting patients who need outpatient care. The result of the study showed that outpatient care services at hospitals is the determinant for an increase in outpatient care services. However, this might also contribute to the higher health status in the higher life expectancy group because this variable was selected in the model for the higher life expectancy group. Well equipped facilities and various kind of medical tests at hospitals allow the patient to detect diseases and take treatment in earlier stages of these diseases.

(b) Determinants of Total Long-term Care Expenditure

The two major positive determinants of Total Long-term Care Expenditure in the two-grouped data were the number of sanatorium type beds and the capacity of Special Nursing Homes in both the higher and lower life expectancy groups. A third positive determinant is Health Services Facilities for the Aged in the higher life expectancy group and the number of general beds in the lower life expectancy group. Long-term Care Insurance does not cover inpatient care services in general beds. Therefore, it might be a spurious correlation with the

inpatient care services in general beds. Therefore, it might be a spurious correlation with the number of sanatorium type beds because the number of general beds and the number of sanatorium type beds were highly correlated.

(c) Comparison of the Determinants between THEE and TLTCE

According to the results of the two-grouped model, one unusual variable is the number of clinics per one hundred thousand population. The number of clinics is a determinant for increasing outpatient care expenditure. At the same time, this variable is a determinant for decreasing inpatient care expenditure. The increase in the number of the clinics leads to better access to primary care. Thus, it may allow patients access to care in earlier disease stages, thus potentially reducing inpatient care expenditures. However, the number of doctors is the major determinant of outpatient care expenditure in the higher life expectancy group, and this implies that outpatient care at hospitals as well as clinics may have a greater role in the higher health status in the higher life expectancy group. Therefore, the policy related to improving health outcome as well as preventing cost increase is especially important.

Table 6.1 Summary of the Standard Coefficients of the Selected Variables by Stepwise Method

	Health Services Availability			Nursing Facility Availability			Home Care Availability				Area Characteristics				
	DOC	CLINIC	BED	SANATO	HSF	SNH	HMHE LP	ELDA LO	HMO WN	FLOOR	INCOME	LIFEM A	LIFE E	UPEL 70	UPEL 65
ALL PREFECTURES															
THEE			0.425	0.480					-0.478					-0.248	
IP			0.728	0.373				-0.238	-0.370						
OP		0.506		0.423		-0.253								-0.319	
TLTCE	0.182			0.422	0.213	0.448									
NC			0.182	0.412	0.248	0.395									
HC							0.569				-0.375				
HIGHER LIFE EXPECTANCY GROUP															
THEE				0.586					-0.407				-0.334		
IP			1.026					-0.413	-0.428						
OP	0.909										0.454			-0.489	
TLTCE				0.569	0.248	0.421									
NC				0.629	0.313	0.341									
HC							0.421				-0.804				0.589
LOWER LIFE EXPECTANCY GROUP															
THEE				0.555			0.643							-0.223	
IP		-0.431	0.549	0.481			0.687								0.182
OP		0.819				-0.492									
TLTCE			0.343	0.388		0.490									
NC		0.111	0.109	0.353	0.410	0.411			-0.180	0.297	0.150				
HC							0.769				-0.346				

6.3 Policy Implications

6.3.1 Policy Implications about Total Health Expenditure for Elderly

Currently, measures to deal with the increasing Total Health Expenditure are a critical issue in Japan. This study has clarified the determinant of Total Health Expenditure for Elderly as the number of general beds. Therefore, a policy which shifts from general beds to sanatorium type beds, is effective for cost containment of the Total Health Expenditure for Elderly. Home-ownership was identified as the determinant which decreases the Total Health Expenditure for Elderly. Therefore, it is recommended to construct barrier free housing for elderly and to support the remodeling of flats, changing them to be barrier free so elderly people can spend their twilight years in their own home. Controlling the number of supply has contributed to limit the THEE increase in Japan. Revision of medical fee tables has also contributed to alleviate the increase of THEE and TLTC³⁹). However, these measures cannot be able to eliminate the regional gap of amongst prefectures. Therefore, to unite the small insurers and delegate them to bestow countervailing powers may reduce the regional gap and it would contribute to plan tailored to each prefecture.

6.3.2 Policy Implications for Total Long-term Care Expenditure

The key determinants of Total Long-term Care Expenditure were three types of nursing facilities which are covered by Long-term Care Insurance. Since sanatorium type beds are more well equipped with medical personnel, the unit cost per month is the highest in the three types of nursing facilities. In the early stage of Long-term Care Insurance implementation, some parts of Total Long-term Care Expenditure will continue to shift from Total Health Expenditures for Elderly, since it will reduce the Social Hospitalization. Therefore, an increase in Total Long-term Care Expenditure is unavoidable in several years from the implementation. However, a further shift from care at nursing facilities to care at home is required to prevent the expansion of Total Long-term Care Expenditure. It would be needed to increase the number of helpers to execute the displacement from facility care to home care, because the major determinant of home care expenditure was the number of home helpers.

³⁹ Although about the 80 percent of the budget of insurers are in deficit, the rate of THE in GDP is lower than other G7 countries except UK (Ogata 2000)

6.4 Limitations of This Study and Suggestions for Further Studies

In this study, the aggregate data of Total Health Expenditure and Total Long-term Care Expenditure were used. However, data identified with personal patient information will be useful for further studies, especially when examining health status. In previous studies, several researchers tried to examine the outcome of health status using the data of claims. However, studying Japanese medical claims is difficult for several reasons. The first is that claims are divided on a monthly basis. Therefore, conclusive results are generally not attainable, because new data is collected in each month and the previous month's data is not continued. The next problem with the claims systems is that doctors do not use a universal set of names when diagnosing disease they are treating. Professional opinions amongst doctors may differ, thus allowing for a myriad of names for the same disease. Therefore, the reliability of the study with Japanese medical claims is limited. It may behoove the Japanese medical community to adopt a rigid coding system like ICD 10. DPC⁴⁰ were initiated in some university hospitals in April of 2003. If this coding system will implemented throughout the country, future researchers would find it much easier to study both health outcomes and health expenditures.

Determinants of long-term care expenditure at nursing facilities were well explained in the model. However, the determinants of home care expenditure were less readily available. This might be the effect of omitted variables. For instance, variables related to demand may influence the home care expenditure. In addition, the outcome of the intervention of long-term care services will be shown with time lag. Therefore, it is important for future studies to accumulate additional data with various outcomes, since the history of the Long-term Care Insurance is only now dawning.

⁴⁰ DPC=Diagnosis Procedure Combination (Japanese DRG)