Vol.21 E1 2010

医療経済研究

医療経済学会雑誌／医療経済研究機構機関誌

医療経済学会 医療経済研究機構

Japanese Journal of Health Economics and Policy Vol.21 E1 2010

ISSN 1340-895X

Vol.21 E1 2010

Japanese Journal of Health Economics and Policy

Contents

Japan Health Economics Association
Institute for Health Economics and Policy

Japanese Journal of Health Economics and Policy

Vol.21 E1 2010

Japan Health Economics Association
Institute for Health Economics and Policy

Editorial

As Chief editor, I am very happy to send you the first English issue of Japanese Journal of Health Economics and Policy.

Since *Japanese Journal of Health Economics and Policy* assumed the role of the official journal of Japan Health Economic Association, or JHEA, in 2006, the journal has helped the association to become one of the most active research associations in the field of social sciences here in Japan. Supported by strong submissions by its members, dedicated associate editors, and a very supportive publisher, we have managed to publish at least two issues every year. In a near future, we may be adding a third one. The success of the journal and JHEA are the two sides of the same coin; both reflect the active and increasing research outputs of the JHEA members and their rapidly improving quality.

Our success, so far, has been mostly domestic. Language barrier and the unique features of our health care system have generally limited the submission of our members to this journal. We have had almost no submission from abroad even though we have been accepting papers written in English. In order to support research activities that meet global standards, and develop research agenda that are particularly important for Japan and for our neighbors, it is clear that JHEA should offer an English journal some time in future. At this moment, given the relative paucity of member's outputs in English, it is still too early.

We have thus decided to start dedicating at least one issue of this journal for papers written in English each year. The English issues will carry the same volume number as other Japanese issues published in the same fiscal year, but they will have a different numbering system, starting with E1. It is only fitting that two of the papers in this issue, one by Professor Fumiaki Yasukawa and the other by Professor Byongho Tchoe, are contributed papers originally presented in the first joint session with Korean Health Economics Association in year 2008. The other two are submitted papers; one is written by Mr. Yoshihiko Kadoya with Dr. Takuma Sugahara providing a counter argument for the editorial committee, and the other by myself.

Lastly, I would like to express my mourning for the loss of Professor Tadashi Yamada of Tsukuba University, a very dear friend of mine, in March 2009. He was an associate editor, who had long contributed to the growth of health economics since its infancy through his numerous works that often reminded us of his teacher, Professor Michael Grossman. We all remember him as a serious scholar, and a very generous teacher, who happily shared his deep insight with his students. He would have been very happy to see this issue, and I am sure he would have submitted one of his own papers. For him, I submitted one of mine to this issue, a paper I had worked on in our last project, and hope he would like the new version.

Seiritsu Ogura
Chief editor
Japanese Journal of Health Economics and Policy

Revisiting the Japanese Comprehensive Reimbursement Scheme for the Elderly Outpatients during 1996-2002 Period: How It Affected Japanese Health Care Practices[1]

Seiritsu Ogura
Hosei Institute on Aging, Hosei University

Abstract

In 1996, Japanese government introduced Comprehensive Reimbursement for Elderly Outpatients, followed by per-visit charge and drug surcharge in 1977. They were an attempt to remove the three basic problems of the Japanese primary-care in those days; over-medication, over-testing, and over-visitation. Taken separately, each measure may have been a sensible measure, but, altogether, they did not work in the way the government had hoped. Particularly disastrous was CREO, as it actually worked to increase the costs of medical care. Through our analyses, we will shown why and how it happened. All the empirical evidences are consistent with our hypothesis; namely, the selectivity of CREO and FFS, and the exemption of CREO patients from paying drug surcharge were the sources of these policy failures. Our estimated treatment effect models indicate that CREO increased the drug costs and total medical costs by 40 to 50 percents.

[**Keywords**] fee-for-service, comprehensive payment scheme, prospective payment scheme, separation of dispensing from medical practice, treatment effect model

1. Introduction

In the early 1990's, the primary concern of the public health insurance authority was the relentless increase in the health care costs of the elderly. It had been threatening to destroy the very framework of the health insurance program supported by the general tax-revenue and cross-subsidization of the employee's health insurance programs. The consensus among the health economists at that time was that four major problems had to be addressed in our health care system; the first was the fee-for-service (FFS) payment of the insurance, the second was the virtually zero out-of-pocket payment for the elderly, the third was the excessive consumption of pharmaceuticals, and the fourth was the so-called social hospitalization. Most argued for the adoption of comprehensive payment scheme similar to DRG instead of FFS, introduction of proportional out-of-pocket payments for the elderly patients, and separation of prescription and sale of pharmaceuticals, as essential ingredients of such a structural reform.

In the *Central Social Insurance Medical Council* in charge of the public health insurance, these reforms had been constantly brought up by the payer's representatives and by the expert members, but they met strong opposition of provider's representatives. In FY1996, however, the government successfully introduced a scheme of Comprehensive Reimbursement scheme for the Elderly Outpatients with chronic "lifestyle" diseases. We will simply refer to this as CREO for short. Then, in September 1997, the government decided to ask elderly patients to start paying 500 yen each time they visit the physicians, instead of the previous flat charge of 1020 yen per month. At the same time, the government introduced a new surcharge for pharmaceuticals for all patients.

Almost immediately after these measures had been put in place, the hospitals and clinics began reporting substantial drops in patient volume, and almost all of them blamed the decrease on the drug surcharge, particularly on the complexity of the rules used to compute the charges. In less than two years after its inception, in July 1999, the strong opposition of providers forced the government to drop the drug surcharge, first by taking over the payment of drug surcharges of elderly patients, and eventually in October 2002, they were repealed altogether. In January 2001, the per-visit charge for elderly patient was also abolished and replaced by a limited 10% proportional out-of-pocket payment[2]. In September 2002, the CREO for elderly was suddenly dropped too; according to the government, "the complexity of its requirements is the source of serious confusion in the medical institutions". Quite ironically, the providers complained that their net revenue deteriorated considerably by the abolition.

By September 2002, without achieving the original goals, all the reform measures that began with the CREO scheme in 1996 had been withdrawn. In October 2002, a complete 10% out-of-pocket payment took effect for the elderly patients. In April 2003, the out-of-pocket payment for the employed workers was raised to 30%, the same level as their dependents. At the same time, the lower limit of the age for elderly health care system was to move up one year for each year to reach age 75, instead of age 70, in five years.

This paper is an attempt to analyze the changes in medical practices that took place in our primary care institutions while these reform measures had been in place. First, we will analyze the economic incentives which these reforms created through a simple theoretical analysis; in particular, what choices they have encouraged or discouraged on the part of patients and on the part of medical institutions. Subsequently, we will analyze how they have affected the various components of health care costs using a unique data collected from a local city during this period. The conclusion of this paper is that these reforms strongly encouraged relatively low cost FFS medical institutions to adopt the new comprehensive reimbursement scheme, but the switch was unfortunately more costly with far more intensive use of pharmaceuticals than FFS, contrary to the presumed goals of these reforms.

The rest of the paper is structured as follows: in 2., we explain the details of the reforms in our public health insurance during 1996 to 2002, and in 3., we analyze the economic incentives these reforms have created for patients and medical institutions using a simple theoretical framework. In 4., we explain the basic structure of the data we use for our analysis, and, in 5., we compare the costs of the FFS claims and Comprehensive Reimbursement Scheme claims during these periods. In 6., we measure the effects of the reforms using econometric methods. In 7., we summarize our findings.

2. Comprehensive Reimbursement for Elderly Outpatients and Increases in Patient Charges

2.1 Comprehensive Reimbursement for Elderly Outpatients (CREO)

Outline of the Scheme

In 1996, the CREO scheme was introduced for the first time as an alternative to the traditional Fee-For-Service insurance claims. The scheme was designed for elderly patients with such common chronic medical conditions as hyper-tension, hyper-lipidemia, diabetes, ischemic cardiac disease, and cerebro-vascular diseases. The only requirement for their physicians was to see the elderly patients at least *twice a month*. Under the scheme, a physician were reimbursed 885 points (or 8,850 yen[3]) for the first visit, and 735 points for the second visit, of the month respectively, as the costs of examination, counseling, tests, medication and shots. It was up to the individual primary-care physicians to adopt CREO or not to adopt it[4].

In 1997, CREO was extended to patients who visit their physicians only once a month and the reimbursement rate was set at 735 points. In 1998, the reimbursement rate for CREO physicians who dispense the drugs themselves was set at 1035 points for the first visits, and 735 points for the second. The reimbursement rate for physicians who write pharmacy prescriptions for their patients was set at 735 points per visit[5]. At the same time, only clinics and hospitals with 200 beds or less were eligible for CREO scheme, and the choice had to be made by the medical institution, and not by physicians[6].

This scheme suddenly attracted a lot of provider's attention in 1997, when the new drug surcharge was introduced for all patients (We will explain the details of the surcharge in 2.2.). They have learned that by adopting this scheme, they would be able to avoid charging their patients the new drug surcharge. The exemption may have made some sense for physicians operating under CREO and dispensing drugs themselves, as they were not required to submit the records of dispensed drugs to the insurers, and the compliance could have been a serious problem. The exemption, however, simply gave all the physicians working under CREO scheme considerable advantage, including those writing pharmacy prescriptions, as they could comfortably guarantee their patients that they would not have to pay the new drug surcharge. In contrast, similar physicians who were practicing under FFS had to ask their patients to pay the new drug surcharge at the pharmacies.

It was not clear why the Ministry of Health and Welfare had made such an exception for CREO physicians. This could have been the sugar-coating on a potentially bitter bill the ministtry had used to persuade the representatives of practicing physicians in the Central Social Insurance Medical Council. Or, the ministry may have been more concerned with the protection of the separation policy of the dispensary and medical practices they had pursued for more than a decade. If they had exempted the CREO patients who get the drugs directly from their doctors, but not the patients who receive the drugs in pharmacies, the new drug surcharge would have strongly encouraged discouraged the former practice, wiping out much of the achievement of the past decade.

In either case, as we will see shortly, this exemption of CREO patients with drug surcharges was most likely the one of the factors that drove a large number of elderly patients from hospitals to clinics.

2.2 The 1997 Reform: Introduction of Per-Visit Charge and Surcharge for Drugs

Introduction of Per Visit Fee

Prior to September 1997, the elderly outpatients (age 70 or older) under FFS scheme had to pay only 1020 yen per month, no matter how many times they had visited their doctors. But starting September 1997, they had to pay 500 yen for each visit up to four times a month at each medical institution. If we ignore the new drug surcharge, the cost of visiting clinics or hospitals for elderly patients actually went down if they visited them only once a month. The cost remained almost the same if they visited twice a month as it changed from 1020 yen to 1000 yen without the drug surcharge. But if they visited the medical institution more than three times a month, they were to be charged 500 yen

per visit up to 2000 yen, and the increase should have reduced the number of elderly patients making the third and the fourth visits. If they had visited there more than five times, the patient charge would be fixed at 2000 yen, but that would be almost twice the 1020 yen they had paid. Thus the per-visit charge should have worked to reduce the number of visits beyond two for a month.

Surcharge for Drugs

At the same time, new surcharge for drugs was introduced for patients of all ages, including the elderly. For non-elderly patients, when they receive drugs from doctors or pharmacies, surcharges were added to their regular out-of-pocket costs. The amount of surcharge was determined by types of drugs, number of drugs, and number of doses, in very peculiar ways. For internal medication, while nothing was charged for one drug, thirty yen per day was charged for two or three different drugs, sixty yen was charged for four or five different drugs, and one hundred yen per day was charged for more than six different drugs. For external medication, 50 yen per day for one drug, 100 yen per day for two different drugs and 150 yen for three or more different drugs. But the actual application of these rules was far more complex and for most patients who take more than one drugs at different intervals they looked very arbitrary.

The elderly patients, too, were asked to pay the same drug surcharge with one important exception; namely if their physicians were working under CREO, they were exempt from the surcharge.

3. A Theoretical Model of Medical Institutions concerning the Choices of Drug Dispensing and Comprehensive Payment

In this section, we will clarify what kinds of providers have adopted this comprehensive payment scheme. To simplify our analysis, we will assume here that a provider receives 1,470 points per month for CREO with pharmacy prescription, but receives 1,770 points per month for CREO with in-house pharmaceutical dispensing.

3.1 Preceding Studies

As far as we know, there is almost no preceding study on our comprehensive reimbursement scheme, presumably because it had been implemented only for a relatively short period of time (from 1996 to 2002). The only exception we have found is Kawai and Maruyama (2000) who had analyzed the effects of fixed-sum reimbursement including the comprehensive reimbursement for elderly outpatient care on health care costs, using the micro-data from the *Survey of Medical Care Activities in Public Health Insurance* (*or, Survey of Medical Care, for short*). They have found that fixed sum reimbursement schemes had increased the health care costs since providers chose them only when they could obtain more reimbursement than FFS scheme.

Although we agree with them in their conclusion, the data they had used reflected only the reimbursement claims submitted directly by hospitals and clinics, but not those submitted by pharmacies. This is because *Survey of Medical Care* draws reimbursement claims randomly from each type of institutions, making no attempt to integrate claims of medical institutions and pharmacies for given patients. As we will show shortly, the comprehensive reimbursement scheme during this period in effect provided a strong economic incentive for pharmacy prescription, and this short-coming in *Survey of Medical Care* data can introduce a substantial downward bias in their conclusion. Thus we need to integrate comprehensive reimbursement claims submitted by medical institutions and pharmacies for individual patients to obtain the total health care costs under the comprehensive reimbursement scheme. Only by comparing these integrated costs with those submitted under FFS, we can reach firm conclusions[7].

3.2 Selection of In-house Dispensing under Fee-for-Service Scheme

Before going into the analysis of comprehensive payment schemes, let us analyze what kind of providers had been dispensing pharmaceuticals to their patients under the fee-for-service scheme. By dispensing pharmaceuticals to patients, providers could keep the substantial differences between the reimbursement prices and wholesale prices of pharmaceuticals that existed in those days, but they have to pay the salaries of pharmacists as well as the inventory costs of drugs. Let us denote the reimbursement claim for, consultation, shots and tests as C_{00}, the cost as c_{00} under FFS with pharmacy prescription. Also for physicians dispensing drugs themselves, we denote the reimbursement for examination as C_0, the cost as c_0, the reimbursement for drugs as T_0, the wholesale cost of the drugs as t_0. If we express the cost of personnel and inventory control of the drugs by θ ,a physician will choose to dispense the drug to his/her patients, if the combined net profit of medical services and dispensing drugs is larger than the sum of the net profit from medical services and θ . That is, the following condition has to be satisfied;

(1) $$(C_0 - c_0) + (T_0 - t_0) > (C_{00} - c_{00}) + \theta .$$

For the sake of simplicity, let us assume

$$C_0 = C_{00}, \quad c_0 = c_{00.}$$

Then (1) means that the price differential of the drug, the second term of the right hand side of the inequality, or $(T_0 - t_0)$, exceeds the inventory control cost θ . If we write the profit rate from dispensing the drugs by π , the price differential can be written as $\pi \cdot t_0$, and (1) is now expressed as

(2a) $$\pi \cdot t_0 > \theta$$

Or

(2b) $$t_0 > \frac{\theta}{\pi} .$$

We can define the breakeven point of in-house drug provision as the ratio of θ to π ; a provider will choose the in-house provision if the per-patient administration of the drug exceeds the break-even point, and the pharmacy prescription otherwise.

3.3 Provider's Choice of Prescription and CREO adoption

Let us consider a provider who was writing pharmacy prescription under FFS, and receiving C_{00} for examination, consultation, shots and tests, and paying c_{00} as their costs. Now under CREO, the provider can receive 1470 points[8] which will cost him c_1. This provider will switch to CREO scheme if the profit from CREO exceeds the profit from FFS, or,

(3) $$C_{00} - c_{00} < 1470 - c_1.$$

Therefore, the necessary condition for the switch is expressed as

$$C_{00} < 1470 + (c_{00} - c_1) .$$

In general, the optimal bundle under FFS, whose cost is c_{00}, is not necessarily optimal for CREO scheme. Under

CREO scheme, for instance, the only requirement for submitting the claim is the number of visits (i.e. at least twice in a month), while under the FFS scheme, a provider has to consider each cost item's profitability separately. For this reason, we can assume that it will be cheaper to take care of a patient under CREO than under FFs; or,

(4) $$c_{00} \geq c_1.$$

We can express our necessary condition (3) as

(5) $$C_{00} < 1470 + \alpha_1.$$

Notice that α_1 is the excess FFS cost over CREO cost, or

(6) $$\alpha_1 = c_{00} - c_1 > 0.$$

Clearly, a provider whose average reimbursement claims under FFS (C_{00}) was equal to or less than 1470 points can benefit from the switch. Only those providers whose reimbursement claims were substantially higher than 1470 plus α_1 points should continue to operate under the FFS.

Provider Dispensing the Drugs: Case 1

Let us now turn to a provider who has been dispensing the drugs to its patients. In particular, first we will consider the set of conditions that will lead it to switch to CREO scheme. As we have denoted above, under FFS, the average reimbursement claim for drugs was T_0, their cost t_0, the average claim for examination, consultation, shots and tests C_0, and the cost as c_0. For this provider to switch to CREO, it has to realize a larger net profit by the change. If we denote the cost of examination etc. as c_2, and the cost of drugs as t_2, both under CREO, this condition can be expressed as

(7) $$(C_0 - c_0) + (T_0 - t_0) < 1770 - (c_2 + t_2)$$

In general, since there is no monitoring in CREO, it is reasonable to assume

(8) $$c_0 + t_0 \geq (c_2 + t_2).$$

Therefore, if we have

(9) $$C_0 + T_0 < 1770 + \beta_2,$$

the condition (7) above is always satisfied. Notice again here that β_2 is the excess cost of care under the FFS defined by

(10) $$\beta_2 = (c_0 + t_0) - (c_2 + t_2) > 0.$$

Thus, a provider whose reimbursement claims were equal to or less than 1770 points will switch to comprehensive reimbursement with drug dispensing.

For such a provider to choose CREO and dispense drugs at the same time, we need a second condition; namely, dispensing drugs has to produce a larger profit than pharmacy prescription. This can be written as

(12) $$1770 - (c_2 + t_2) > 1440 - c_1 + \theta,$$

where θ is the (per patient) administrative costs of drugs, including salaries of pharmacists and inventory control costs. Thus, the second condition can be written as

(13) $$t_2 + \theta < 300 + (c_1 - c_2).$$

Let us assume for the sake of simplicity that c_1 and c_2 are the same;

(14) $$c_1 = c_2.$$

Then the second condition is reduced to

(15) $$t_2 + \theta < 300.$$

Thus, the cost of drugs given to patients cannot exceed 300 points, if the provider is to adopt CREO and dispense drugs at the same time.

Providers Switching to Pharmacy Prescriptions: Case 2

Lastly, we have to think of a case where a provider who has been dispensing drugs internally under FFS scheme decides to adopt comprehensive reimbursement with pharmacy prescription. We will denote the average reimbursement claims for drugs as T_0, their costs as t_0, claims for examination etc as C_0, their costs as c_0. This provider will switch to comprehensive scheme if a larger profit is secured. This condition is written as

(16) $$(C_0 - c_0) + (T_0 - t_0) < 1470 - c_3 + \theta,$$

where c_3 is the costs of examination etc. under the CREO with pharmacy prescription. It is clear that if the inequality

$$C_0 + \pi \cdot t_0 < 1470 + \alpha_2 + \theta$$

holds for a provider, condition (16) is satisfied. We note here that α_2 is defined by

(17) $$\alpha_2 = c_0 - c_3 > 0.$$

Recall that for internal provision, condition (2a) has to hold, and we have the following inequalities;

$$C_0 + \theta < C_0 + \pi \cdot t_0 < 1470 + \alpha_2 + \theta.$$

Thus one sufficient condition for (16), which is the first necessary condition for a provider to switch from in-house to pharmacy prescription, and FFS to comprehensive at the same time, is given by

(18) $$C_0 < 1470 + \alpha_2.$$

Furthermore, we need the second condition such that pharmacy prescription brings in more profit than in-house provision within the comprehensive reimbursement scheme. This condition is obtained by simply reversing the inequality (15); namely,

(19) $$t_2 + \theta > 300.$$

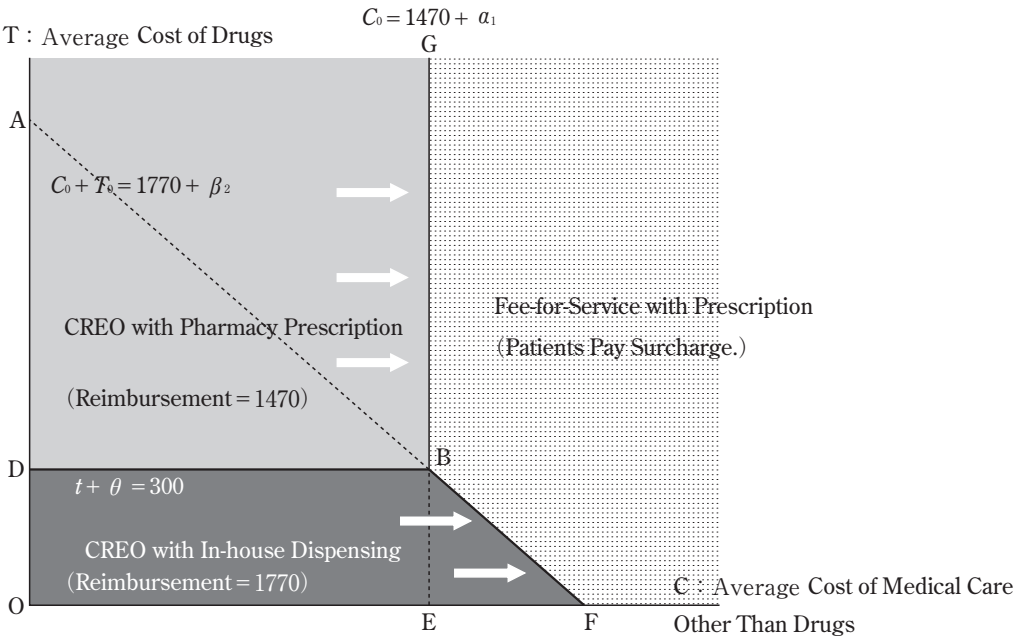


Figure 1: Average Patient's Characteristics and Rational Selection of Reimbursement Schemes

Namely, since the total cost of providing the drugs internally exceeds 300 points allowed under the comprehensive reimbursement program, it opts for pharmacy prescription.

3.4 Optimal Decision Rules and Their Implications

We have summarized the preceding analyses in Figure 1. The horizontal axis measures the points for examination, tests, shots etc. under FFS, and the vertical axis measures the points for the costs of drugs under FFS, for the average elderly outpatient. The decision rules are very simple.

(A) Every provider with patients to the left of BF submits a CREO claim with drug dispensing and receives 1770 points. In terms of patient characteristics, these are patients whose drugs cost are relatively inexpensive, less than 300 points, and consume relatively small amount of medical care.

(B) Every provider with patients above BD but to the left of BG submits a CREO claim with pharmacy prescription and receives 1470 points for examination, tests, shots etc.. In terms of patient characteristics, these are patients whose drugs cost are relatively expensive, but consume relatively small amount of medical care, less than 1470 points.

(C) Every provider with patients to the right of BG or to the right of BF continues to submit a FFS claim and write pharmacy prescription. In terms of patient characteristics, these are patients who consume relatively large amount of medical care, and whose drug cost are relatively expensive.

4. Description of our Data

The data used in this paper were collected in a small city in western part of Japan from the reimbursement claims submitted to Health Care Program for the Aged. Selected entries of all the claims during the following two different periods were transcribe; firstly, from June to November of 1997, and secondly, from April to September of 1999. If a claim submitted by a medical institution indicated the existence of a pharmacy prescription, we looked for a pharmacy claim for the same patient for the same month and the same medical institution. A small number of unmatched medical claims and pharmacy's claims had been left after these procedures, and they were removed from our dataset[9].

4.1 Three Periods

We classify our data into three different periods, using the year and month during which the medical examination took place.

- First period: June, July and August of 1997, prior to the increase in out of pocket costs of the elderly.
- Second period: September, October, and November of 1997, and April, May and June of 1999, both after the increase in out of pocket costs.
- Third period: July, August and September of 1999, after the removal of the special drug surcharge from the elderly patients.

While the comprehensive reimbursement scheme underwent minor changes, to simplify our analysis, we will ignore them.

Table 1. Visits and Cost Statistics of Four Types of Medical Institutions

		medical institutions			
		small	general	geriatric	clinics
Period 1	number	2,017	605	848	7,433
	n. of visits	4.55	1.53	4.91	3.62
	r. claims	2453.82	1883.78	3114.11	1981.37
	o. pockets	1052.19	1007.54	1019.17	1019.40
Period 2	number	3,525	1,313	1,722	17,198
	n. of visits	3.62	1.52	4.39	3.48
	r. claims	2453.93	1408.56	2644.84	1913.98
	o. pockets	1195.93	696.74	1425.01	1226.84
Period 3	number	1,512	662	865	10,374
	n. of visits	2.47	1.44	4.15	3.52
	r. claims	2549.77	1162.95	2338.86	1849.50
	o. pockets	1022.14	658.01	1424.57	1240.84

4.2 Analysis of Insurance Claims Submitted by Medical Institutions

In Table 1, we have classified the medical institutions into four types (general hospitals, hospitals, geriatric hospitals and clinics), and we have shown the average number of visits of patient per month, points claimed for reimbursement, average out-of-pocket costs per patient, and average amount of drug surcharge, in each of these three periods. Particularly, regarding the drug surcharge, we note here that the figures only account for those paid at hospitals and clinics.

Small Hospitals[10]

According to Table 1, the average number of patient visits had decreased almost by two days during this period; from 4.5 days in period 1, to 3.6 days in period 2, and 2.5 days in period 3. The average reimbursement claims, however, remained stable around 2450 points. The patient's out-of-pocket costs had shown an increase from 1052 yen in period 1 to 1195 yen in period 2, but it decreased to 1022 yen in period 3. Special drug surcharges jumped from almost zero to more than 800 yen.

General Hospitals[11]

Throughout these three periods, general hospitals experienced a small decline in average number of visits from 1.53 to 1.44, but the average reimbursement claims had dropped very sharply from 1,884 points to 1,162 points. Most likely, this sharp decline reflected special local factors that were not related to changes in public health insurance system. Average out-of-pocket cost of patient has decreased from 1,007 yen to 658 yen, a 35% point decline. Special drug charges were zero in period 1, increased to 407 yen in period 2, and declined to 160 yen in period 3. Because of the apparent data anomaly, in what follows, we will not try to explain the changes concerning general hospitals.

Geriatric Hospitals[12]

The average number of visits in geriatric hospitals decreased by 0.8 days during these periods; it was 4.9 days in period 1, but decreased to 4.4 days in period 2, and further to 4.1 days in period 3. The average reimbursement claims decreased almost by 30 percent from 3,114 points to 2,338 points, while the average out-of-pocket cost of patients increased from 1,019 yen to 1,424 yen. The average drug surcharge was zero in period 1, but increased to 150 yen in period 2, and remained almost the same in period 3.

Clinics

The number of visits of patients remained very stable through these periods; it was 3.6 days in period 1, and 3.5 days in periods 2 and 3. The average reimbursement claims also remained relatively stable; it was 1,981 points in period 1, and increased slightly in period 2, but dropped to around 1,850 points in period 3. Average out-of-pocket cost of patient was also relatively stable through these periods; it was 1,019 yen in period 1, was 1,220 yen in period 2, and was 1,240 yen in period 3. Average drug surcharge was 103 yen in period2, and 97 yen in period3.

Number of Patients

Since one reimbursement claim is submitted for one patient by a medical institution every month, the number of reimbursement claims submitted is a very accurate index on the choice of medical institutions by patients. Recall that there are three months in our periods 1 and 3, but six months in period 2. Although some of the variations in the patient volume must have reflected seasonal factors, we will assume they were minor, as winter months have been excluded. We assume that most of the changes in patient volume were driven by changes in costs to patients. Thus we should expect to have about the same number of claims in period 1 and 3, and twice the number in period 2, if all things are the same.

In this regard, hospitals that had around 2,000 claims in period 1 probably lost some patients during these periods, as it had only 3,500 claims in period 2, and 1,500 claims in period 3. Geriatric hospitals experienced little change in the number of patients; it had 850 claims in period 1, more than 1,700 claims in period 2, and about the same number of claims as period 1 in period 3. On the other hand, clinics experienced a substantial increase in their patients; in the first period, the number of claims was 7,400, in the second period, it was 17,000, and in the third, it was 10,000.

Table 2. Numbers and Costs of Parmacy Claims by Origin Medical Institutions

Origin	Items	Period 1		Period 2		Period 3	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Small	Num. of P.Claims*	946		1239		294	
	Cost of P.Claims	1275.06	1132.58	1313.19	1117.85	1699.70	1213.39
	Patient Cost	0.00	0.00	656.28	789.70	1098.57	1085.83
General	Num. of P.Claims*	29		377		348	
	Cost of P.Claims	1620.03	1135.91	1639.50	1918.89	1576.81	1807.00
	Patient Cost	0.00	0.00	1098.54	1163.90	1084.97	1164.05
Geriatric	Num. of P.Claims*	581		1205		621	
	Cost of P.Claims	1692.51	1125.92	1540.59	1057.09	1521.78	1072.85
	Patient Cost	0.00	0.00	237.98	665.11	310.82	764.63
Clinics	Num. of P.Claims*	4897		12018		7691	
	Cost of P.Claims	1006.45	1396.29	984.30	1112.89	953.97	839.75
	Patient Cost	0.06	3.03	289.48	513.67	292.36	525.30

4.3 Analysis of Reimbursement Claims of Pharmacies

Prescription Reimbursement Claims

The preceding figures are based on the reimbursement claims submitted by medical institutions. They can be quite misleading, as more and more medical institutions under persistent government pressure adopt pharmacy prescriptions. In order to get accurate information on the total health care cost, we need to integrate these two kinds of claims, one submitted by medical institutions and the other submitted by pharmacies, for each patient. In Table 2, we have classified the medical institutions that had issued the original prescriptions on which the pharmacies submitted their claims.

Number of Prescription Reimbursement Claims

Geriatric hospitals had a mild increase in the number of pharmacy claims; in period 1, it was 581, it was 1,205 in period 2, and in period 3, it was 621. Clinics had the dominant share in the number of pharmacy claims, and experienced a sizeable increase during these periods; in period 1, the number was 4,897, in period 2, it was 12,018, and in period 3, it was 7,691. On the other hand, small hospitals had experienced a huge drop; in period 1, it was 946, in period 2, it was less than 1,250, but in period 3, it was less than 300.

Costs of Pharmacy Claims and Patient Charges

As to the average value of pharmacy claims, only those coming from small hospitals experienced increases; it was 1,275 points in period 1, and increased slightly to 1,313 points in period 2, and sharply to 1,700 points in period 3. As to the total pharmaceutical charges to patients including the drug surcharge, it was zero in the first period, but jumped to 656 yen in period 2, and to 1,099 yen in period 3.

The rest of medical institutions, more or less, experienced declines. The average value of pharmacy claims coming from geriatric hospitals was 1,693 points in period 1, declined to 1,541 points in period 2, and stayed at 1,522 points in period 3. The total pharmaceutical charge to patients remained modest; it was 238 yen in the second, and

increased to 311 yen in the third.

As to the clinics, the average value of pharmaceutical claims was 1,006 points in period 1, decreased slightly to 984 points in period 2, and decreased again to 954 points in period 3. As to the total pharmaceutical charge to patient, it was virtually zero in period 1, increased to 289 yen in period 2, and increased slightly to 293 yen period 3.

Table 3. Cost Information on Integrated Claims byTypes of Medical Institutions

Types	Items	Period 1		Period 2		Period 3	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Small Hospitals	N. of Claims*	2017		3525		1512	
	Total Medical Cost	3051.84	3983.41	2915.51	4223.54	2880.27	4371.70
	Total Patient Cost	1052.70	817.41	2031.57	1581.53	1022.14	547.81
	Drug Charge to Patient	0.51	22.71	835.65	916.73	0.00	0.00
	Pharmacy Claims	598.02	1003.18	461.57	912.24	330.50	859.25
General Hosiptals	N. of Claims*	605		1313		662	
	Total Medical Cost	1961.43	2245.52	1879.31	2108.72	1991.85	2206.59
	Total Patient Cost	1007.54	109.35	1419.41	1174.68	658.01	391.86
	Drug Charge to Patient	0.00	0.00	722.67	1047.99	0.00	0.00
	Pharmacy Claims	77.65	424.01	470.75	1267.22	828.90	1528.08
Geriatric Hospitals	N. of Claims*	848		1722		865	
	Total Medical Cost	4273.73	4191.64	3722.90	3707.21	3431.38	3331.02
	Total Patient Cost	1019.17	11.67	1741.16	1170.24	1424.57	539.04
	Drug Charge to Patient	0.00	0.00	316.15	694.22	0.00	0.00
	Pharmacy Claims	1159.61	1219.33	1078.05	1131.67	1092.52	1138.19
Clinics	N. of Claims*	7433		17198		10374	
	Total Medical Cost	2644.43	3999.82	2601.81	3777.33	2556.74	3545.34
	Total Patient Cost	1020.44	62.10	1532.39	879.08	1240.84	603.45
	Drug Charge to Patient	1.04	36.74	305.54	531.40	0.00	0.00
	Pharmacy Claims	663.07	1229.67	687.83	1034.11	707.24	835.04

4.4 Cost of Integrated Claims and Total Charges to Patient

Let us define the cost of integrated claims as the sum of the costs of medical claims and pharmacy claims. In Table 3, we have shown the average costs of the integrated claims for each type of medical institutions in each period. Almost all types of medical institutions experienced a decline in the second period and in the third period as well. For geriatric hospitals, the declines were most conspicuous; in period 1, it was 4,273 points, in period 2, it went down to 3,723 points, and it declined further down to 3,431 points in period 3. For clinics, the declines were relatively modest; in period 1, it was 2,644 points, and in period 2, went down to 2,601 points, and again to 2,556 points in period 3. For small hospitals the declines were modest, too; in period 1, it was 3,051 points, in period 2, went down to 2,916 points, and in period 3, to 2,880 points.

With respect to total patient charges, the pattern of the changes was very similar; they increased sharply in the second period, and declined hard in the third period. These changes were most dramatic in small hospitals, but geriatric hospitals and clinics also experienced sizeable changes. In small hospitals, it started at 1053 yen in period 1, almost doubled to 2031 yen in period 2, but came down to 1022 yen in period 3, reflecting the government takeover of

the drug surcharges. In geriatric hospitals, it started at 1019 yen in period 1, increased by 70% to 1741 yen in period 2, but dropped to 1425 yen in period 3. In clinics, it started at 1020 yen in period 1, increased almost by 50% to 1532 yen in period 2, but dropped to 1240 yen in period 3.

In the first period, average patient charges in different types of medical institutions were very close to each other, but the "reforms" in the public health insurance system prior to the second period created a large variance across different types of medical institutions. As a result, in the second period, patients at small hospitals paid more than 2,000 yen in what they paid at hospitals and at pharmacies, followed by those of geriatric hospitals paying close to 1,700 yen, followed by those of clinics paying more than 1,500 yen. But in the third period when government took over the payment of special drug surcharge, these differentials shrank considerably; the largest were patients at geriatric hospitals paying 1,400 yen, followed by those at clinics paying 1,240 yen, and, by those at hospitals paying 1,020 yen.

Table 4. Share of the Number of Pharmacy Claims to the Number of Medical Claims by Types of Medical Institutions

Types	Period 1	Period 2	Period 3
Small Hospitals	0.469	0.351	0.194
General Hospitals	0.048	0.287	0.526
Geriatric Hospitals	0.685	0.700	0.718
Clinic	0.659	0.699	0.741
Total	0.592	0.625	0.668

Sources: Tables 2 and 3

In Table 4, we have shown the percentage of pharmacy's claims to medical claims. For small hospitals, in the first period, the share was 47%, but, subsequently, it dropped sharply to less than 20% in the third period. For geriatric hospitals and clinics, the shares were more than 65% in the first period, and they kept on increasing to reach more than 70% in the third period for both of them.

In sum, the share of pharmacy's claims declined in hospitals that lost patients, but they went up for clinics and geriatric hospitals that gained patients after the reforms in public health insurance system. In other words, medical institutions that gained patients during these periods largely coincided with those that relied on pharmacy prescriptions.

Table 5. Share of OCR Claims in Each Period

	Period 1	Period 2	Period 3	Total
N. of Medical Claims (A)	9381	18851	10664	38896
(A/C)%	86.0	79.3	79.5	80.85
N. of OCR Claims (B)	1522	4910	2778	9210
(B/C)%	14.0	20.7	20.7	19.15
Total N. of Medical Claims	10903	23758	13413	48074
	100	100	100	100

Table 6. The Share of OCR Claims by Types of Medical Institution and by Periods

	Period 1			Period 2			Period 3		
	N. of Medical Claims	N. of OCR Claims	Total	N. of Medical Claims	N. of OCR Claims	Total	N. of Medical Claims	N. of OCR Claims	Total
Small	1986	31	2017	3449	76	3525	1473	39	1512
	0.985	0.015	1.000	0.978	0.022	1.000	0.974	0.026	1.000
General	605	0	605	1313	0	1313	662	0	662
	1.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000	1.000
Geriatric	381	467	848	771	951	1722	403	462	865
	0.449	0.551	1.000	0.448	0.552	1.000	0.466	0.534	1.000
Clinics	6409	1024	7433	13315	3883	17198	8097	2277	10374
	0.862	0.138	1.000	0.774	0.226	1.000	0.781	0.219	1.000
Total	9381	1522	10903	18848	4910	23758	10635	2778	13413
	0.860	0.140	1.000	0.793	0.207	1.000	0.793	0.207	1.000

5. Characteristics of CREO Claims

5.1 Empirical Criteria for CREO

Unfortunately, our reimbursement claim data did not carry an identifier for CREO scheme. We could, nevertheless, identify those claims fairly accurately using the following set of rules[13] ;

(1) medical claims unaccompanied by pharmacy claims, satisfying both of the following two conditions;
  (a) zero reimbursement for examination, drugs and shots, and
  (b) reimbursement claims for consultation exceeding those of comprehensive scheme:
(2) medical claims accompanied by pharmacy claims, satisfying all of the following three conditions;
  (a) no reimbursement for examination, drugs and shots,
  (b) reimbursement for consultation exceeding the CREO points, and
  (c) no charge to patient in the pharmacy claims.

5.2 Proportions of CREO Claims

In Table 5, we have shown the shares of CREO claims in each period. In the first period, comprehensive reimbursement claims accounted for less than 14% of all the claims, but, in period 2 the share went up close to 21%,

and in period 3 the share stayed unchanged.

In Table 6, we have shown the shares of comprehensive reimbursement claims in each type of medical institution for the three periods. Only 1.5 % of small hospitals adopted the scheme in the first period, it increased to 2% in period 2, and increased only slightly in period 3. In contrast, 55% of geriatric hospitals had adopted the scheme in the first period, and the share kept decreased only slightly to 53% in period 3.In clinics, the share of the comprehensive scheme which was 14% in period 1, it increased to reach 23% in period 2, and decreased slightly in the third period.

Table 7. Comparison of FFS Claims and OCR Claims

		Geriatric Hospitals				Clinics			
		FFS		CREO		FFS		CREO	
		Mean	St. Dev	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
Period 1	N. of Claims*	381		771		6409		1024	
	Medical Costs	5224.8	5987.6	4340.9	5343.7	2584.6	4279.3	3019.2	1165.3
	R. Claims	4664.3	6099.5	3749.1	5363.1	1987.5	4004.4	1942.9	605.4
	P. Costs	1072.8	1259.3	961.3	1198.1	772.2	1260.5	1076.2	854.1
	Total Patient Charge	1018.3	17.1	2317.8	1490.4	1020.5	66.9	1020.0	0.0
	P. Patient Charge	0.0	0.0	706.1	895.2	1.2	39.6	0.0	0.0
	N. of Visits	6.5	4.8	5.9	4.7	3.6	4.1	3.5	3.3
Period 2	N. of Claims*	467		951		13315		3883	
	Medical Costs	3497.8	1165.1	3221.8	1091.6	2491.8	4230.2	2978.9	1284.9
	R. Claims	1849.4	495.1	1749.6	486.2	1922.0	3990.0	1886.4	680.9
	P. Costs	1648.5	958.1	1472.2	878.9	719.9	1020.1	1092.9	968.1
	Total Patient Charge	1019.9	2.8	1273.7	438.1	1579.7	953.8	1370.0	518.9
	P. Patient Charge	0.0	0.0	0.0	0.0	394.6	574.1	0.0	0.0
	N. of Visits	3.6	3.1	3.2	3.3	3.4	4.1	3.7	3.7
Period 3	N. of Claims*	403		462		8097		2277	
	Medical Costs	3788.0	4724.8	3120.3	1058.4	2419.1	3944.6	3046.0	1276.9
	R. Claims	3074.9	4686.9	1696.8	411.6	1848.8	3770.4	852.157	704.4
	P. Costs	1011.3	1268.7	1423.6	886.5	719.6	756.3	1193.9	934.4
	Total Patient Charge	1553.2	605.1	1312.4	445.2	1200.0	616.7	1386.1	528.9
	P. Patient Charge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	N. of Visits	5.3	4.4	3.1	2.9	3.5	4.3	3.7	3.7

* : Total Number of Claims Submitted during the Period

5.3 Comparison of FFS Costs and CREO Costs

Let us compare the costs of care between FFS and CREO in two relatively homogenous medical institutions, namely, geriatric hospitals and clinics. We have selected geriatric hospitals because we can secure enough sample size; the comprehensive reimbursement claims account for more than 50 % of their reimbursement claims. Although in clinics the comprehensive reimbursement claims account only around 20%, they have the largest patient population. The results of the comparison are shown in Table 7.

Geriatric Hospitals

Period 1: The average total cost of claims was 5,225 points for FFS patients, but 3,498 points for CREO patients. Medical claims accounted for 4,664 points for FFS patients, but only 1,849 points for CREO patients. Pharmaceutical claims accounted for 1,073 points for FFS patients, but 1,648 points for CREO patients. Thus the average share of pharmaceuticals in total cost of claims was 21% for FFS, but in CREO patients, it reached more than 47%. The average number of visits was 6.48 days for FFS patients, but it was only 3.64 days for CREO patients.

Period 2: The average total cost of claims for FFS patients was 4,341 points, or a decline of 17% from period 1, and it was 3,222 points for CREO patients, or a 8 percent decline. Medical claims for FFS patients decline by 20%, but, those for CREO patients declined only by 6%. Pharmacy claims declined almost by 10% in both kinds of patients. Total patient charge almost doubled to 2,318 yen for FFS patients, but it increased only by 20% for CREO patients. The average number of visits declined by 0.5 day for both FFS and CREO patients.

Period 3: The average total cost of claims for FFS patients was 3,788, which is a decline of 13% from the previous period, but for CREO patients, decline has almost ended. Cost of medical claims for FFS patients showed another decline of almost 20 percents, but the cost for CREO patients showed a decline of only around 5%. Pharmaceutical costs for FFS patients increased by 5%, but it decreased by 3% for CREO patients. Government's takeover of the drug surcharge benefited only the FFS patients, as the total patient charge dropped to 1,553 points for FFS patients, but it actually increased a little to 1,312 points for CREO patients. The average number of visits had another decline of 0.5 days for FFS patients, but the decline had stopped for CREO patients.

These observations on geriatric hospitals seem to be consistent with our theoretical model. Geriatric hospitals working under FFS are expected to try to produce as much profitable medical service internally, but those working under CREO are expected to minimize the internal production cost of medical services, and substitute them by pharmaceuticals that are not included in the fixed reimbursement. In practice, our data shows that the costs of pharmaceuticals of CREO institutions are substantially higher than those of FFS institutions.

So long as the patient charges are almost uniform across different types of medical institutions, these different medical practices will not affect the distribution of patients across these institutions. But when per visit charge and special drug surcharge were introduced, the difference in medical practices resulted in differences in patient charges. The differences in medical charges in turn induced changes in patient behaviors, including the reduction in the number of physician visits and move to medical institutions with smaller patient charges.

Clinics

Period 1：Total cost of integrated claims was 2,585 points for patients in FFS clinics, but 3,019 points for those in CREO clinics. Costs of medical claims, however, were not very different in these two types of clinics, with the former accounting for 1,987 points, and the latter for 1,942 points. Cost of pharmaceuticals were significantly different, with the FFS clinics accounting for 772 points, or 29.9 % of the total, and CREO clinics accounting for 1,076 points, or 35.6% of the total. The average numbers of visits were not very different; it was 3.64 days for FFS, and 3.55 days in CREO.

Period 2：Total costs of integrated claims dropped in both types of clinics; in FFS clinics, it was 2,942 points, or a drop of 4%, and in CREO clinics, it was 2,979 points, or a drop of 1.5%. Costs of medical claims dropped by 3% in FFS clinics and in CREO clinics as well. But the pharmaceutical costs moved in opposite directions; in FFS clinics, the cost of pharmaceuticals went down to 720 points, or a 7% drop, but in CREO clinics, it went up to 1,093 points, or a 2% increase. Total patient charge increased to 1,580 yen, a 55% increase, in FFS clinics, but it was 1,370 yen, a 34% increase, in CREO clinics. Average number of visits decreased by 0.2 days to 3.42 days in FFS but it increased by 0.1 days to 3.68 days in CREO clinics.

Period 3：Costs of integrated claims decreased by 3% for FFS clinics, but they increased by 2% in CREO clinics. As a result, the latter（3,046 points）is almost 20% more costly than the former（2,419 points）. Cost of medical claims decreased in both of them; FFS declined by 4%, while CREO declined by 2%. Pharmaceutical costs in FFS clinics remained almost the same as the previous period, but they increased almost by 9% in CREO clinics. Patient charges

dropped sharply to 1,200 yen in FFS clinics as a result of government's takeover of the drug surcharge, but they actually increased slightly to 1,386 yen in CREO clinics mostly because their patients had not paid drug surcharges. Average number of visits increased slightly to 3.5 days in FFS clinics, but it did not change very much for CREO clinics.

Again these comparative results on clinics seem to support our theoretical model. In the first period, elderly patients paid a fixed sum regardless of the intensity of the treatments they received. On average, CREO clinics spent almost 30% more in pharmaceutical costs than FFS clinics. Total costs of integrated claims were higher in CREO clinics than FFS clinics, but the difference was mainly due to pharmaceutical costs. The introduction of per visit charges and drug surcharges in the second period made FFS clinics more costly than CREO clinics, but actually the average difference was only 200 yen. Nevertheless, the lower cost attracted a substantial number of patients into CREO clinics where the physicians spend 30% more in pharmaceutical costs. In the third period, when the drug surcharges were dropped, FFS clinics suddenly became less costly than CREO clinics.

6. Econometric Analysis of Outpatient Comprehensive Reimbursement

6.1 Estimation of the Effects of CREO on Medical Care Practices

In what follows, we will explore the effects of CREO on medical practices of physicians, particularly on the cost of drugs, and the total medical costs. We will concentrate our analysis on clinics for which we have enough sample size.

The adoption of CREO depends not only on the physicians but also on the patients. In order to estimate the effect of the effects of CREO on the medical practices or their costs, we cannot treat CREO as another exogenous variable and use simple OLS. In particular, let us assume that the costs of prescription drugs per month (y_{ij}) is determined by the patient's characteristics (X_i) such as sex, age and diagnosed diseases, clinic (physician) characteristics (W_j), and the dummy variable for CREO (D_{ij}). Thus we have the following equation,

$$y_{ij} = \beta X_i + \gamma W_j + \tau D_{ij} + \varepsilon_{ij},$$

to estimate.

On the right hand size of the last equation, however, we should treat D_{ij} as a potential endogenous variable that depends on the value of the following latent variable z_{ij};

$$z_{ij} = \alpha X^*_i + \eta W^*_j + v_{ij},$$

where X^* and W^* are the relevant properties of average patients and the clinic, respectively. If the error terms of the first and second equations are independent, we can estimate the number of prescription drug equation by OLS and obtain consistent estimates of the parameters of the first equation. If, however, the error terms are correlated, estimating the equation by OLS will give us biased estimates of the true coefficients.

In such a case, we should estimate these two equations jointly by the method of maximum likelihood, the second one as a probit equation for CREO selection, or though a two-step procedure and the first one as a linear equation with an endogenous CREO dummy variable through maximum likelihood estimation. Such a model is known as treatment effect model.

6.2 Specifications

We examine the effect of CREO on the cost of drugs for clinic patients, but the cost of the drugs dispensed directly by the CREO physicians are not recorded in the reimbursement claim forms and those reimbursement claims were removed from this analysis. In effect, we will be comparing the costs of drugs of FFS physicians with

those of CREO physicians both of whom were writing pharmacy prescriptions. The cost of drugs of FFS physicians are obtained by summing the items for drugs and pharmacist charges in both medical claims and pharmacy claims. The costs of drugs of CREO physicians are the cost of pharmacy claims for their prescriptions.

In terms of specification, the explanatory variables in the cost of drugs equation are the disease dummy variables for the patient, dummy variables for period 2 and period 3, and the dummy variable for CREO. In the CREO equation, the dummy variables for period 2 and period 3, the number of beds, average number of diseases of all the patients of the clinic, and the total number of elderly patients of the clinic were selected. If the error term in the CREO equation is independent of the error of the cost of drugs equation, there is no bias in the CREO coefficient, but it has an upward or downward bias depending on whether the error terms have a positive or a negative correlation. In other words, if the physicians who choose CREO system tend to give more drugs, OLS result would be upward-biased, but if they tend to give less amount of drugs, OLS result will be downward biased.

Table 8. Estimation Results of Total Medical Costs Equation

Total pharmaceutical costs equation						
Est. Method	OLS	OLS	Two-step	Two-step	FML	FML
num. of obs	20642	20642	20641	20641	20641	20641
R2/Log Likelihood	0.610	0.476			-29837.706	-30040.675
Root MSE	0.542	0.652				
Variables 1) 2)						
num. of visits	0.043	0.044	0.043	0.044	0.043	0.044
OCR	0.222	0.206	0.394	0.373	0.410	0.391
female	-0.042	-0.041	-0.042	-0.042	-0.042	-0.041
num. of diseases	0.088		0.088		0.088	
Period 2	-0.102	-0.092	-0.113	-0.102	-0.114	-0.104
Period 3	-0.122	-0.105	-0.133	-0.115	-0.133	-0.116
OCR probit equation						
Variables 1)						
Period 2			0.147	0.147	0.156	0.156
Period 3			0.174	0.174	0.185	0.184
num. of beds			-0.091	-0.091	-0.089	-0.089
ave. num. of diseases			0.177	0.177	0.170	0.171
num. of patients			-0.002	-0.002	-0.002	-0.002
constant			-0.768	-0.768	-0.730	-0.739
Other Parameters						
rho			-0.171	-0.165	-0.186	-0.182
sigma			0.647	0.653	0.648	0.654
lambda			-0.111	-0.108	-0.121	-0.119
Wald test 3)					53.07	49.72

1. All the coefficients have p-values<0.001.

2. Coefficients of disease dummy variables are not shown here.

3. Chi2 statistics for the independence of the two equations (rho=0)

6.3 Effects of CREO on the Cost of Drugs

In Table 8, the second and the third columns show the results of OLS estimation of the drug cost equation. According to the OLS results, the CREO has increased the cost of drugs by more than 20%, while the reforms in the second period reduced the pharmaceutical costs by 10%, and the effects remained intact in the third period. The fourth and fifth columns of the same table show the results of treatment effect estimation by two-step procedure. According to the two-step procedure, for a given patient, if his physician has accepted CREO, the cost of drugs would be 37% to 39% larger than what his physician used to use under FFS. In the last two columns of the same table, we report the results of the maximum-likelihood estimation. The cost of drugs under CREO practice would be larger than those under FFS practice roughly by 40%, almost double the OLS estimates. The OLS underestimated the effect of CREO on the cost of drugs, because, as we had expected in our theoretical model, physicians who tend to use less drugs for given conditions of patients tend to choose CREO more. The reforms including the drug surcharge had reduced the drugs costs of (baseline) FFS physicians by more than 10% in the second period, and, slightly more in the third period, in spite of the end of drug surcharge, respectively compared with the first period.

In the bottom part of the same column, we can see the characteristics of clinics that adopted the CREO. The more beds and the more patients a clinics has, less likely it is to adopt CREO. But more diagnosed diseases an average patient has, more likely it is to adopt CREO. In the second period, the probability of adopting CREO increased by 15%, and slightly more in the third period, both compared with the first period.

Table 9. Estimation of total medical costs equation

Total medical costs equation						
Est. Method	OLS	OLS	Two-step	Two-step	FML	FML
num. of obs	20642	20642	20642	20642	20642	20642
R2/Log Likelihood	0.610	0.606			-26219.493	-26309.84
Root MSE	0.542	0.545				
Variables 1) 2)						
num. of visits	0.082	0.083	0.082	0.082	0.081	0.082
OCR	0.157	0.148	0.327	0.315	0.552	0.557
female	-0.047	-0.047	-0.047	-0.047	-0.046	-0.045
num. of diseases	0.049		0.050		0.049	
Period 2	-0.052	-0.047	-0.063	-0.057	-0.077	-0.072
Period 3	-0.083	-0.073	-0.093	-0.083	-0.107	-0.098
OCR probit equation						
Variables 1)						
Period 2			0.147	0.147	0.147	0.148
Period 3			0.174	0.174	0.166	0.165
num. of beds			-0.091	-0.091	-0.085	-0.085
ave. num. of diseases			0.177	0.177	0.161	0.162
num. of patients			-0.002	-0.002	-0.002	-0.002
constant			-0.768	-0.768	-0.747	-0.758
Other Parameters						
rho			-0.200	-0.197	-0.446	-0.459
sigma			0.545	0.547	0.563	0.566
lambda			-0.109	-0.108	-0.251	-0.260
Wald test 3)					71.31	71.36

1. All the coefficients have p-values<0.001.

2. Coefficients of disease dummy variables are not shown here.

3. Chi2 statistics for the independence of the two equations (rho=0)

6.4 Effects of CREO on Total Medical Costs

In Table 9, the second and the third column show the results of OLS estimation of the total medical cost equation. We define the total medical costs as the sum of the costs in the physician's claims (inclusive of out-of-pocket costs) and the pharmacy's claims for their prescriptions. The estimated coefficients show that CREO has increased the total medical costs by 15% or so, while the reforms have reduced the costs by 5% in the second period and by 7% or more in the third period, respectively, compared with the first period. The fourth and fifth columns of the same table show the results of our two-step treatment effect estimation. According to the two-step estimation, CREO physicians managed to charge 30% or more compared with FFS physicians. The sixth and seventh columns of the same table show the results of full maximum-likelihood estimation of the treatment model. According to the FML results, CREO was even more costly, both to the government and to the patients; it managed to increase the costs of CREO physicians by 55% compared with FFS physicians, controlling for patients' diagnosed diseases, provided that both physicians were writing pharmacy prescription. On the other hand, the reforms including the drug surcharge had reduced the medical costs of (baseline) FFS physicians by 7% in the second period, and, by 10% in the third period in spite of the end of drug surcharge, both compared with the first period.

7. Conclusions

In 1996, Japanese government introduced Comprehensive Reimbursement for Elderly Outpatients in an attempt to remove the three basic problems of the Japanese primary-care in those days; over-medication, over-testing, and over-visitation. Geriatric hospitals and clinics were intended as primary targets of CREO, but they were also given the choice to remain under FFS. By providing fixed payment to treat patients with common chronic diseases, the government hoped to remove the incentives to provide excessive care. In 1997, the government followed it by introducing per-visit charge and drug surcharge. Taken separately, each of these measures should have been a sensible measure, but, altogether, they did not work in the way the government had hoped.

Particularly disappointing was CREO, as it actually worked to increase the costs of medical care. Through our analyses, we have shown why and how it happened:

(1) we have shown that the reform measures of 1997 drove substantial number of elderly patients from FFS scheme to CREO scheme. We have shown that the switch was made in medical institutions that provided patients with relative low intensity of care but with high volume of drugs:

(2) as almost half of the geriatric hospital patients had been already treated under CREO, the additional measures of 1977 had relatively small effects on geriatric hospitals:

(3) the adoption of CREO increased substantially after the 1977 measures, and almost all CREO patients were issued pharmacy prescriptions, which exempted them from paying the drug surcharge at pharmacies. The clinics with relatively high drug cost patients had stronger incentive to adopt the scheme, and once they adopted the scheme, they felt no incentive to reduce the drug costs.

In sum, CREO was very costly; according to our estimation, it had increased the drug costs and the medical costs of CREO clinics by 40 to 50 percent. This is in sharp contrast with FFS clinics that had decreased their drug costs and total medical costs by almost 10 percent. Our analysis points to the sources of these failures; there were two of them. First is the selectivity of CREO and FFS. The targeted medical institutions could select either of the two depending on which one is more profitable. The second critical error is the exemption of CREO patients from paying drug surcharge. The first problem would have been far less costly in the absence of the second problem[14]. Thus the exemption was the proverbial horse-shoe nail[15] that had been lost in a fight to control the health care costs of the elderly.

Footnotes

1 I would like to thank All-Japan Federation of National Health Insurance Organizations for making this date set available for our research. I would like to thank the referee of this journal for his helpful comments. The original version of this paper had been presented at the Japan Economic Society Meeting in 2006. I have benefited from Professor Wataru Suzuki's valuable comments there. This research has been supported by a research grant from Pfizer-zaidan (principal investigator Tadashi Yamada 2003-2004) and a special grant to Hitotsubashi University from the Ministry of Education, Science and Technology (principal investigator Noriyuki Takayama 2009).

2 There was an upper-limit to the out-of-pocket payment for the elderly patients; for in-house prescription, it was 3000 yen for clinics and hospitals with less than 200 beds, but 5000 yen for hospitals with more beds. For outside prescription, the upper-limit was one-half of that amount for both medical institutions and pharmacies. Also clinics were able to choose to charge 800 yen per visit up to four times a month.

3 One point is worth ten yen in Japanese public health insurance reimbursement.

4 Other physicians are allowed to claim "joint supervision fee" (more than 200 points) up to twice a month.

5 For patients visiting once a month, the reimbursement was 735 points for an in-house prescription, but it was 885 points otherwise.

6 In other words, a medical institution must accept the comprehensive reimbursement scheme for all patients to whom the scheme was applicable. When the patient's condition suddenly deteriorates, however, it was able to provide necessary medical services on the fee-for-service basis.

7 Furthermore, in measuring the effects on medical care costs and the number of visits of the comprehensive reimbursement scheme, Kawai and Maruyama (2000) have used its dummy variable as an independent variable. As the choice of comprehensive reimbursement may be an endogenous variable, their result suffers from an endogeneity bias.

8 In this section, we are expressing critical values of the system in terms of points rather than in terms of yen.

9 These were mostly medical reimbursement claims submitted by providers located outside this city.

10 This category includes all the hospitals that were neither general hospitals nor geriatric hospitals. To be exact, therefore, they are "other hospitals". Since most of these hospitals are small hospitals, particularly in a local city of modest population, we will refer them as "small hospitals". Since these hospitals tend to be small, we refer them as small hospitals.

11 Until the revision of Medical Service Act in 1996, a general hospital was a hospital with at least 100 beds, and had to offer at least the following five departments; internal medicine, surgery, otorhinolaryngology, ophthalmology, obstetrics and gynecology. Although the classification was abolished in 1996, most hospitals that had called themselves general hospitals still continue to use the name.

12 The government used to classify a hospital as a geriatric hospital, if more than 60 percent of its inpatients was 65 years old or older, and reimbursed its claims at reduced rates.

13 We have tried a simpler criterion for OCR scheme where examination points exactly matched those in OCR scheme; practically speaking, there were no difference between the two criteria.

14 In January 2001, the government started to impose 10% surcharge for all pharmacy prescriptions, subject to caps. For clinics and small hospitals, the maximum surcharge was set at 1,500 and for large hospitals, it was 2,500.

15 *"For want of a nail the shoe was lost. For want of a shoe the horse was lost. For want of a horse the rider was lost. For want of a rider the battle was lost. For want of a battle the kingdom was lost. And all for the want of a horseshoe nail."*

References (in Japanese)

Seiritsu Ogura (2006)," Why CREO Pushed Up the Health Care Costs of the Elderly?", paper presented at Japan Economic Association.

Hiroki Kawai and Shiko Maruyama, "An analysis of the effect of the inclusive payment system on costs and intensity of care-the cases of elderly outpatients and infant outpatients", Japanese Journal of Health Economics and Policy, Vol.7 2000, pp37-63.

Diagnosis-Related Group-based Payment System and its Reform Plan in Korea

Byongho Tchoe
Korea Institute for Health and Social Affairs
Visiting Scholar at Stanford University

Abstract

Although Korea has been using a diagnosis-related group (DRG)-based payment since 1997, the system is applied only to a limited number of patients and providers, mainly due to the strong opposition among providers. Recently, health care authority in Korea released a new plan for expanding the coverage of the DRG system, but, this plan too came under severe criticism from both providers and experts. The present paper assesses the current DRG system as well as the new plan, and suggests policy directions and strategies to extend the current system. Because the health care industry is founded on a long-standing fee-for-service (FFS) system, payment reform will be difficult, and strategies aiming to expand the current DRG-based payment system must be prepared to withstand possible negative effects and provider backlash.

[**Keywords**] diagnosis-related groups, provider payment, DRG-based payment

1. Introduction

How purchasers choose to pay providers, in general, has a critical effect on providers' medical decisions, and hence, on the efficiency and the equity of the health care system (Pauly 2000). The Korean health care system has maintained a fee-for-service (FFS) payment system since the introduction of social health insurance in 1977. Under the FFS system, providers are given autonomy in the medical decision-makings, and, if medically necessary, they can provide treatments without budget constraints. Many argue that this is the root cause of the rapid increase in Korea's health care costs. Under the FFS system, health care cost is controlled primarily by the size of patient's copayment, or, to put it in another way, by the demand-side cost-sharing. For this reason, the Korean health care system has maintained a high level of copayment, amounting to nearly half the total cost of treatment.

Introducing a supply-side cost-sharing into the payment system should give a strong incentive to providers to control medical expenses; it will expose them to the economic risk of over-utilization of health care resources by patients (Ellis and McGuire 1993). A DRG-based payment is an example of such a supply-side cost sharing. In 1983, the United States developed a DRG-based payment system for Medicare inpatient care, and subsequently Korea developed K-DRG (Shin et al. 1986). In 1991, Yale University developed the "Refined DRG" system (Fetter et al. 1989; Freeman et al. 1995) and soon after, Korea produced a new version of K-DRG; both take into account the severity of patients' condition (Shin et al. 1993). In 1994, adoption of DRG-based payment was officially proposed by the task

force for health care reform. The Korean government welcomed the proposal a way to utilize resources more efficiently, and a way to contain health care costs. A pilot project was started in 1997 and was carried out for 5 years.

In 2002, the DRG-based payment system was officially introduced, but, it was applied only to seven DRGs, and providers were allowed to decide whether or not to adopt the DRG based payment system. The government's original plan was to make the DRG-based payment compulsory, but the plan was blocked by the strong objections of providers. The choice of DRG-based or FFS-based payment, in turn, has been criticized by experts as a new source of waste, as providers will simply choose one that is most profitable. The process of implementing DRG-based payment was also criticized after the pilot projects were initiated in 1997. For these reasons, the implementation of a DRG system for all providers and/or all inpatient care has since remained at a standstill.

In May 2008, a new plan for DRG-based payment was proposed by HIRA, Health Insurance Review & Assessment Service, which is a government agency who reviews claims submitted by providers, assesses the quality of care provided, and makes decisions for reimbursement. HIRA's plan was very similar to the Japanese DPC, Diagnosis Procedure Combination scheme, which is a mixed system composed of flat-rate (per-case, per-diem) payment and FFS payment. However, the HIRA plan was also criticized, for various reasons, by both experts and providers.

The present paper reviews the performance of the DRG-based payment system that has been in place for over a decade in Korea, and examines the criticism that has been launched against the current DRG system. A plan for reform and strategies for the implementation of DRG-based payment in order to improve efficiency and equity, taking into consideration the objections of providers, are then suggested.

2. Provider Payment System in Korea

2-1. Outline of Korean National Health Insurance

Korea first implemented universal health care in 1989, only 12 years after the introduction of National Health Insurance (NHI). The National Health Insurance is financed mainly by the contributions of employers and participants (85.0%), which, as of 2007, is supplemented by the government's general budget (10.6%) and by cigarette tax revenues (3.8%). The contribution rate of the insurance in 2008 was 5.1% of salary or wages, shared by employers and employees. Benefits coverage is uniform across the country: as of 2007, NHI covers 55.7% of the health care cost, with the remainder paid for by the patient (Jung 2009). As mentioned earlier, NHI reimburses providers mainly through FFS-based payment for both inpatient and outpatient care. Providers may choose DRG-based payment for seven diagnosis groups in the inpatient care, instead of FFS payment. Per-diem payment is applied in long-term care hospitals, community health centers, and for Medicaid mental patients. NHI is administered by a single insurer, NHIC (National Health Insurance Corporation), but NHIC relegates the review of claims from providers and the quality assurance of provider's services to HIRA. The Ministry of Health and Welfare supervises and controls both NHIC and HIRA in detail. All medical institutions are required to have contracts with NHIC.

Health care is provided mostly by the private sector—clinics are exclusively private, and almost 90% of hospital beds are private. Public hospitals are not differentiated from private hospitals in the competition for patients. There are few limitations for patients in choosing medical providers across the nation, which suggests that current patient referral procedures are largely ineffective. Even tertiary hospitals are directly accessible to patients without difficulty; the only obstacles for patients are higher copayments and indirect costs such as traveling and waiting time.

2-2. FFS-based Payment System

In Korea, providers are reimbursed primarily by FFS, charging a fee for each item provided to patients. Providers' revenues consist of service charges (67%), pharmaceuticals (29%), and materials (4%). Service charges under the Korean system include doctor's fees and clinic or hospital operating expenses, in contrast to the American

Table 1. Number of insured and non-insured items, 2007

	Insured items	Non-insured items	Total
Services	5,091	444	5,537
Pharmaceuticals	21,740	6,634	28,374
Materials	9,217	734	9,951
Total	36,048	7,812	43,862

Source: Ministry of Health and Welfare

and European systems in which FFS comprises primarily the physician's labor, as well as miscellaneous expenses accompanying physician's services. The total number of items reimbursed under the FFS system is around 36,000, including 5,000 physician's service items, 22,000 pharmaceutical items, and 9,000 material items; 8,000 items are non-insured (Table 1). Including non-insured items, the total number of items provided under the FFS system approaches 44,000.

Fees under the FFS system are calculated on the basis of three factors; namely, the relative value scale (RVS), conversion factors, and additional rates. The RVS represents the value of resources invested in a particular service, and there are four large categories for them; Western medicine, dental medicine, Oriental medicine, and pharmacy. The conversion factors convert RVS' into monetary units, and their values are set separately for clinics, hospitals, dental clinics, practitioners of Oriental medicine, and pharmacies. Each year the NHIC sets the conversion factor for each type of provider. In a given year, if the NHIC and the providers fail to reach an agreement on the values of conversion factors, they are then determined by the NHI Council, which is the top decision-making body consisting of the representatives of consumers, providers, insurers, government, and experts. Finally, fees are adjusted by adding special rates depending on the type of medical institution—15% for clinics, 20% for hospitals, 25% for general hospitals, and 30% for teaching hospitals. Conversion factors and additional fees are also applied to DRG-based payment.

2-3. DRG-based Payment System

From February 1997 to December 2001, three pilot projects were carried out, and the outcomes generally satisfied the expectations of the health administration. Providers, however, opposed the introduction of DRG—they preferred FFS, which, they believed, would be more manageable to achieve both target profits for themselves and the best possible care for patitents. In view of the strong resistance of providers, only eight DRGs were introduced in July 2002, and providers were allowed to choose either FFS-based or DRG-based reimbursement. Moreover, following the demands of obstetricians, one DRG (vaginal delivery) was excluded beginning in September 2003. In response to rapidly increasing inpatient expenditures, in 2003 the government attempted to expand the coverage of the DRG system to all medical institutions. The attempt again met strong opposition from providers and was retracted.

Current DRG Codes are as follows; each DRG is classified by patient age (older than 18 or younger than 18), areas of operation, use of technology (e.g., celioscope), and severity (2 or 3 grades): (a) ophthalmology; lens procedures (12 DRGs); (b) ENT (ear, nose, throat); tonsillectomy and/or adenoidectomy (4 DRGs); (c) general surgery; anal and/or stomal procedures (6 DRGs); inguinal and/or femoral hernia procedures (8 DRGs); appendectomy (6 DRGs); (d) OBGY (obstetrics and gynecology); uterine and/or adnexal procedures (12 DRGs).

While DRG includes most services necessary to treat a particular diagnosis, the following services are excluded from the package: higher-grade hospital rooms; meals; treatment fees charged by specialists chosen by patients; ultrasound; and other statutory non-insurance services, including non-medical services. Most clinics with inpatient beds have adopted DRG-based payment, but a few large hospitals have chosen the FFS system. In 2007, 69% of all providers participated in the DRG system; 78% of these were clinics, 42% were small and medium hospitals, 39%

Table 2. Trends in medical institutions that adopted DRG-based payment

	Pilot project period					After pilot					
	1st (1997)	2nd (1998)	3rd			2002	2003	2004	2005	2006	2007
			1999	2000	2001						
Total	54	132	798	1,268	1,645	1,839 (57.5)	1,965 (59.0)	2,066 (60.6)	2,213 (62.8)	2,277 (66.4)	2,350 (69.0)
Teaching hospitals	2	11	16	16	15	4 (9.5)	2 (4.8)	2 (4.8)	1 (2.4)	1 (2.3)	1 (2.3)
General hospitals	22	61	95	111	108	109 (45.2)	112 (46.5)	102 (42.2)	101 (40.6)	96 (37.9)	101 (38.7)
Small/ medium Hospitals	19	29	78	106	131	153 (49.0)	174 (47.9)	184 (42.9)	188 (40.5)	201 (44.0)	198 (41.7)
Clinics	11	31	609	1,035	1,391	1,573 (60.5)	1,677 (62.5)	1,778 (66.0)	1,923 (69.5)	1,979 (74.0)	2,050 (78.0)

Note: Numbers in parentheses refer to participation rate in percent.
Source: Ministry of Health and Welfare

Table 3. Trends in claims for DRG-based payment and expenditures

			Number of cases	Claimed expenditures (in millions of Korean Won)	Insurer payment (in millions of Korean Won)
Pilot projects	1st	1997	41,870	28,541	23,059
	2nd	1998	167,878	128,734	104,274
	3rd	1999 (Feb-Dec)	375,766	286,828	233,652
		2000	581,236	425,219	347,396
		2001	650,970	484,477	397,621
After Pilot		2002	640,919	457,532	367,534
		2003	655,810	490,797	393,826
		2004	594,681	480,946	387,022
		2005	611,609	504,066	406,055
		2006	635,615	543,713	440,963
		2007	671,511	602,749	489,055

Source: Health Insurance Review & Assessment Service

were general hospitals, and only one was a teaching hospital (National Medical Institute) (Table 2).

In 2007 DRG-based payment accounted only 9.6% of the number of inpatient cases, and 6.9% of all inpatient expenditures. As shown in Table 3, moreover, the number of cases claimed by DRG changed little after the completion of the pilot projects. In fact, from the table, one would hardly notice that Korea has formally implemented a DRG-based payment system in 2002.

Under DRG-based system, fees are calculated as the sum of two parts; one part is fees for services reimbursed by NHI and the other is expenses of services not covered by the NHI but included in the DRG package. For this reason, the level of reimbursement by DRG-based payment on average is greater than that by FFS. Fees are usually more favorable to clinics but relatively unattractive to larger hospitals (Table 4)—this is why larger hospitals are not

Table 4. Relative fee levels of DRG-based payment compared to FFS

	1999	2000	2001	2002	2003	2004	2005	2006
Average	126.71	126.99	114.46	114.11	113.54	114.35	116.46	115.79
Teaching hospitals	121.83	123.33	113.55	115.70	111.34	109.97	112.02	109.21
General hospitals	120.32	120.11	105.31	113.78	112.48	112.54	111.17	109.21
Small/Medium hospitals	124.76	130.62	111.50	110.20	117.31	116.32	117.08	110.93
Clinics	131.85	130.26	120.59	115.30	112.93	115.32	119.63	121.87

Note: numbers are indices compared to FFS fee levels in the basis of 100.

in favor of adopting the DRG system. More specifically, as larger hospitals provide more complicated and diversified treatments with more sophisticated devices and a higher level of technology, they need more reimbursement for the treatment of a specific episode than smaller hospitals and clinics do. To encourage the participation of large hospitals in the DRG system, health administration developed a new version of DRG including more age-specific and severity-specific criteria. In theory, they could be more profitable for large hospitals with more severely ill patients (Kang et al. 2004). However, the new proposal did not have the anticipated effects, as many hospitals did not respond to the measure, and participation in DRG has actually declined (see Table 2).

3. Assessment of DRG-based payment

3-1. Outcomes of pilot projects

Health administration assessed the results of pilot projects in operation between 1997 and 1999, and reported relatively positive outcomes (Ministry of Health and Welfare 2000). Claimed expenses, a proxy of supply of health services, were reduced by at least 3.2% and at most 10.3% during the pilot periods compared to those under the FFS system. Total hospital days decreased by 4.3-9.3% during the pilot period. Per capita antibiotics use, an important measure of practice behavior, was reduced by at least 9.75% and at most 24.92% during the pilot period. In terms of quality of care, there were few significant differences in the rates of complications and re-surgery during the pilot periods. In particular, PPI (physician performance index), an index that measures appropriate provision of necessary medical services, increased during the pilot period.

Theoretically speaking, under the DRG-based prospective payment system, providers have an incentive to reduce the quality of care, but there is little evidence of a negative impact on patient outcomes in the United States (Rogers et al. 1990; Coulam and Gaumer 1991). This is partly because attending physicians in the United States, who are reimbursed by insurers through a payment scheme separate from the hospital, can counteract the hospital's incentive to reduce medical inputs and lower quality of care. However, the surgical procedures incorporated into the Korean DRG pilot projects were relatively simple ones, which could explain the low rates of adverse outcomes. DRG payment may have a different impact on the quality of more complicated procedures (Kwon 2003).

A survey was administered to 1,800 patients and patients' guardians to measure perceptions of the DRG system during the third demonstration period. Patients and guardians recognized that their out-of-pocket payment had decreased by around 20%. Regarding the bundled payment of the DRG system, 44.3% of respondents were satisfied, 6% were unsatisfied, and the remaining 50% were undecided.

Despite these positive outcomes, a consensus to introduce the DRG system could not be established due to

criticism from both experts and providers. Both experts and providers insisted that they should have access to the data used for the assessment of the government. Health care experts contended that assessment should be conducted by independent academics free from government's influence to assure unbiased and credible results. On the other hand, providers' association insisted that, if the government wants to get credit from providers, providers must be allowed to assess the DRG system themselves. However, the opportunity to review assessment outcomes was not conferred to either of them. The health administration was reluctant to allow access to data and examine their evaluation methods, because providers and experts could raise problems on the credibility of the data and the evaluation methods, and jeopardiz the initiation of the DRG system.

3-2. Assessment of the current DRG-based payment system by HIRA

The pilot projects ended in 2001, and the government was prepared to implement a compulsory DRG system. However, hospitals associations strongly opposed the DRG system, and, since 2002, the choice of whether or not to adopt the DRG system has been left up to individual providers. Moreover, the DRG system has been maintained with few changes compared to the contents of previous pilot projects. Many health care providers preferred the FFS system over the DRG payment system because they feel that the former better guarantees "clinical autonomy". They also argue that the generous payment of the current DRG system is just a temporary carrot, and the government will later reduce it, once the participation of all health care institutions is ensured. Obstetricians are the most active opponents of the DRG payment system, as the relevant disease category under the DRG system, normal delivery and caesarean section, accounts for most of their revenue (Kwon 2003).

Recently, HIRA examined DRG-based payment performance for the period between 2002 and 2006 (HIRA 2008). Fee per case was increased 10.6% over the 4-year period, while FFS-based fees increased 12.1%. The number of hospital days per case was reduced 16.1% under the DRG system, but was reduced only 7.2% under the FFS system. Almost all (99.8-100%) claim reviews were completed within 7 days under the DRG system, compared to only 0.02~1 % for the FFS system. Petitions against the results of review accounted for only 0.01~0.05% of total claims under the DRG system. Few changes were observed in the quality of provided services, but more investigation is required to draw any definitive conclusions. During the period studied, larger hospitals became less likely to participate in DRG system, while the participation of clinics increased; this suggests that DRG-based payment does not sufficiently reimburse hospitals (particularly large hospitals) for patients with severe problems. Specifically, hospitals are not reimbursed sufficiently for new technologies, impeding the participation of technology-intensive hospitals such as the big five hospitals in Korea, which are owned by Hyundai Corporation, Samsung Corporation, Seoul National University, Yonsei University, and the Catholic University of Korea.

3-3. Criticism of the current DRG system

Much of the criticism of the current DRG system has been focused on the voluntary participation of providers. Under voluntary participation, providers would be free to choose either the DRG or the FFS system depending on which system generates higher revenue and lower medical cost. Moreover, the government made DRG fees higher than FFS fees in order to encourage providers to participate in the DRG system, which continuously raised medical expenditures. Likewise, if voluntary participation were to be maintained, unnecessary resources would be continuously wasted. On the other hand, quality monitoring is indispensable to prevent quality depreciation under the DRG system. Due to concerns for the low rate of participation of hospitals, however, monitoring has not been enforced under DGR system, causing concerns on the lack of quality control and its consequences. With voluntary participation, enforcement of monitoring is likely to encourage some providers to return to FFS system.

Some criticisms focused on the introduction of the DRG system itself. The most critical objection was that the Korean DRG system used a different mechanism from the one in the United States, which designed and implemented the DRG system for the first time. More speicifically, the Korean DRG system reimburses both hospital cost and

doctor's fees, while the American DRG system includes only hospital cost not doctor's fees. The doctor's fees are reimbursed by FFS in the United States. Therefore, the Korean DRG system may weaken the incentive of doctors to provide the best possible care to patients compared to the American system. Furthermore, in Korea, all doctors working for hospitals are employed exclusively by the hospital owners, and hence they are more likely to work for the hospital's interests rather than the patient's. In the United States, where an attending system is common, doctors provide consultations at their own clinics and utilize hospital facilities for the patient's interest. Secondly, cost shifting from inpatient to outpatient care would be greater under the Korean DRG system than the American system. Korean hospitals have maintained a large amount outpatient care, which has been the major source of their revenues. Hospitals could thus compensate for the loss from the DRG system by shifting some of its costs to the outpatient care. American hospitals have experienced some cost shifting, even thought U.S. hospitals have much smaller outpatient care sector. Thirdly, in response to the insufficient reimbursement by the DRG system, providers may be tempted to sacrifice the quality of care instead of making an honest effort to reduce costs. The lost social benefits due to this drop in quality may be greater than the potential savings acquired from the DRG system.

Finally, a new trend in DRG-based payment policy in the United States is also worthy of note. Recently, the Center for Medicare Services (CMS) announced that they will carry out a demonstration project of bundling together both hospital costs and doctor's fees for 3 years starting January 2009 (American Hospital Association News, May 16, 2008). For the first year, these fees will be applied to 28 cardiac and 9 orthopedic inpatient surgical services performed at 15 sites in Colorado, New Mexico, Oklahoma, and Texas.

3-4. Why is DRG-based payment considered a viable alternative for provider payment reform?

Korea has experienced a rapid growth in health care expenditures. This can be explained by the increasing demand for health care, due to rapid income growth, the increasing elderly population, and the vigorous diffusion of new medical technologies. Most experts identify the FFS-based payment system as a key institutional factor in the increasing cost of health care. The OECD Health Data seems to support this proposition. From 1995 to 2005, the number of hospital discharges in Korea increased by 70.9%, the highest among the OECD countries; in contrast, in Japan, hospital discharges increased by only 5.4%, and by 6.2% in all the OECD countries taken together. As of 2005, the average length of stay in hospitals (ALOS) was 10.6 days in Korea, second highest among OECD countries with Japan, at 19.8 days, the highest. For comparison, the average among OECD countries was only 6.3 days. The annual rate of increase in per capita inpatient spending in Korea was 12.3% during the period between 1990 and 2006, which was exceptionally high among OECD countries. Overall, the annual rate of increase in per capita medical spending in real terms for 1995-2005 period was 7.6% in Korea, again the highest among OECD countries, which is three times of Japan (2.6%), and almost twice of the OECD average (4.0%).

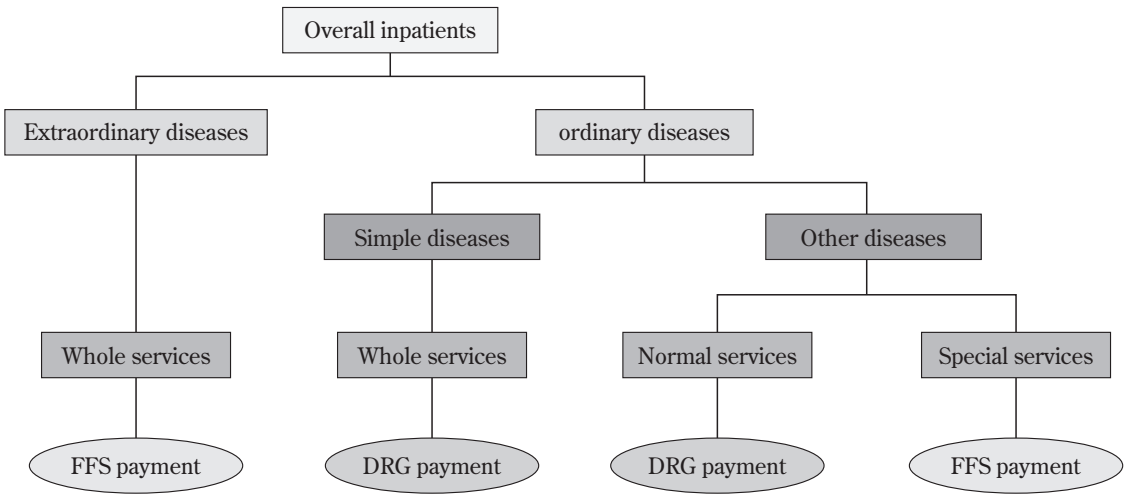
The annual rate of increase in per capita pharmaceutical cost in real terms for 1995-2005 period was 5.4% in Korea, ninth among OECD countries; this was only 0.8% in Japan, and the OECD average was 4.6%. The number of MRI tests performed per million people as of 2005 was 12.1 in Korea; Japan, with 40.1 performed per million people, had the highest rate of MRI test among OECD countries, higher than the United States (26.6 per million) and substantially higher than the OECD average (9.8 per million). The number of CT scans per million people in 2005 was 32.2 in Korea, the same as in the United States (which has high diffusion of medical technology), but it was Japan that had the most CT scanners per million people of any OECD country, at 92.6, several times higher than the OECD average of 20.6. The number of mammographies per million people in 2005 was 28.7 in Korea and 42.2 in France (the highest among OECD countries), with an OECD average of 19.9.

While these indicators suggest good health care performance and an affluent medical environment in Korea, they also imply that unnecessary health care services have been provided to patients, generating inefficient use and waste of resources. A significant proportion of such waste has allegedly been caused by the distortion in the FFS-based payment. In addition, it is very costly for both insurers and providers to maintain the huge and complicated FFS system, for which 36,000 items must be claimed and reviewed in detail. Furthermore, detailed reviews and

Table 5. HIRA's future plan for implementing the DRG system

Year	Plan
2008	Apply to NHIC hospitals ('Ilsan hospital') (*Develop patient classification, cost analysis, set fee schedule)
2009	Perform system trial in selected public hospitals
2010 - 2011	Compulsory implementation for public hospitals; voluntary for private hospitals
2012	Compulsory implementation for all hospitals

Source: HIRA 2008



Source: HIRA 2008

Figure 1. Plan for provider payment for inpatient care: a mix of DRG and FFS

inspections by HIRA often impinge on doctors' self-esteem and practice autonomy.

Recently, in most advanced countries, DRG-based payment or DRG has come into wide use, as a tool for allocating health care budget. Korea is one of the few countries that have maintained the FFS system for most health care services. It is time for Korea to come up a way to positively implement a DRG system. Moreover, because many providers have extensive experience with DRG-based payment, the DRG system can be implemented with little technical difficulty once adequate conditions and incentives are granted to hospitals and they accept the new system.

4. HIRA's Plan for DRG-based Payment

4-1. Future plan for DRG-based payment

The Korean health administration authority intends to convert the current FFS-based payment system into a DRG-based system for inpatient care for all providers. Under the supervision of the Ministry of Health, HIRA established a new task force for the implementation of the DRG system in 2007. HIRA released a preliminary plan for carrying out the transition to the DRG system in May 2008 (HIRA 2008). The outline of plan is to extend DRGs to all inpatient care, and to apply the DRG system to all providers in several steps. At the first step, the DRG system should be applied to the insurer's hospital, which is a tertiary hospital, for all inpatient care. Then, the classification of

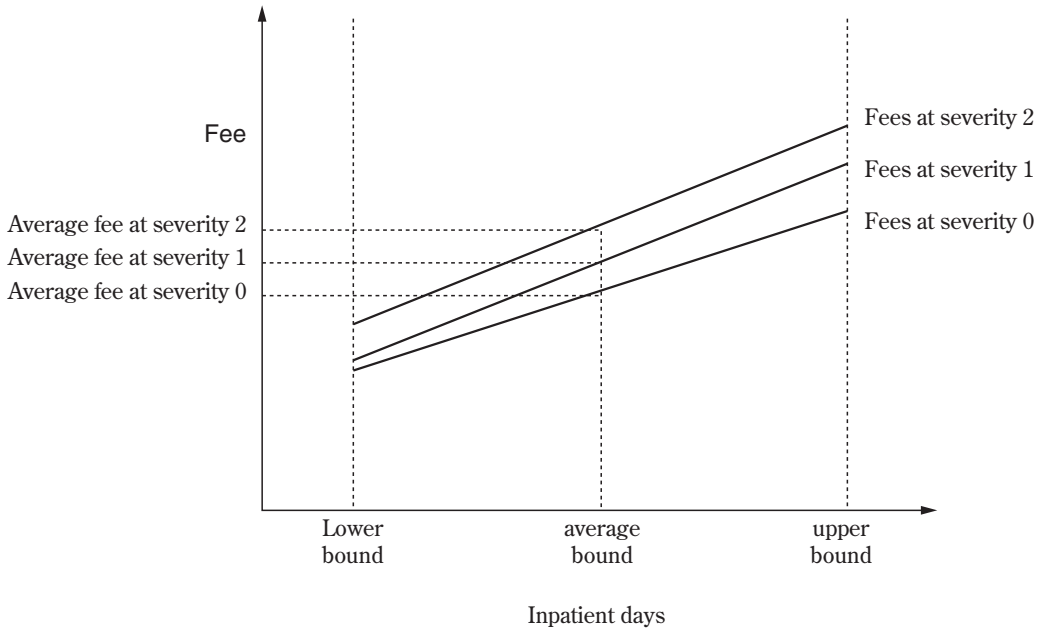


Figure 2. HIRA's Proposal for DRG Fee Schedule

patients should be developed, which could apply to large hospitals, and cost analysis should be conducted for proper reimbursement. After establishing a viable DRG plan, a DRG system trial could be performed in selected public hospitals; after reviewing the results of the trial and revising the system as necessary, DRG could be applied to public hospitals by 2010 or 2011, and eventually all hospitals by 2012 (Table 5).

On the other hand, some groups of diseases and services should be exempted from the reimbursement package. Ordinary diseases and normal services should be appropriated for the bundling of services; however, extraordinary diseases and special services that may have unexpected variances in the volume of medical treatment and costs should be handled on an FFS basis, as bundled reimbursement per case might not be able to meet cost variances (Figure 1).

HIRA proposed a DRG fee schedule as follows. If hospital days are in the range of 5-95% of its distribution, DRG fee is computed as Basic Case Payment + (Hospital days - Average hospital days) × per-diem rate (Figure 2). In this computation, the Basic Case Payment is the average expenditure per case evaluated at the average of hospital days, and per-diem rate is obtained as the coefficient (slope) of hospital days in the regression equation for expenditures with severity of the patient's condition as the shift parameters. However, average hospital days are independent from the degree of severity. For the cases whose hospital days are less than 5% or more than 95% of the distribution, DRG based fees are not applied; instead, they are reimbursed by FFS payment. Expensive procedures, materials, and pharmaceuticals which are over 100,000 Korean Won (about 80 US Dollars) are reimbursed by FFS payment

Fee adjustments for general hospitals or teaching hospitals will be performed in a different way, as simply adding up certain percentages to the basic fee schedule is inappropriate. Details of adjustment for general or teaching hospitals have not yet been determined, but the adjustment must be based on the severity of patients' illnesses treated in these hospitals. Severity is supposed to be the provider's capacity and utilization of resources. Annual adjustment should be applied in two different ways, such that the service fees are adjusted as a product of RVS points and conversion factor, and payments for pharmaceuticals and materials are adjusted according to the change of price indices.

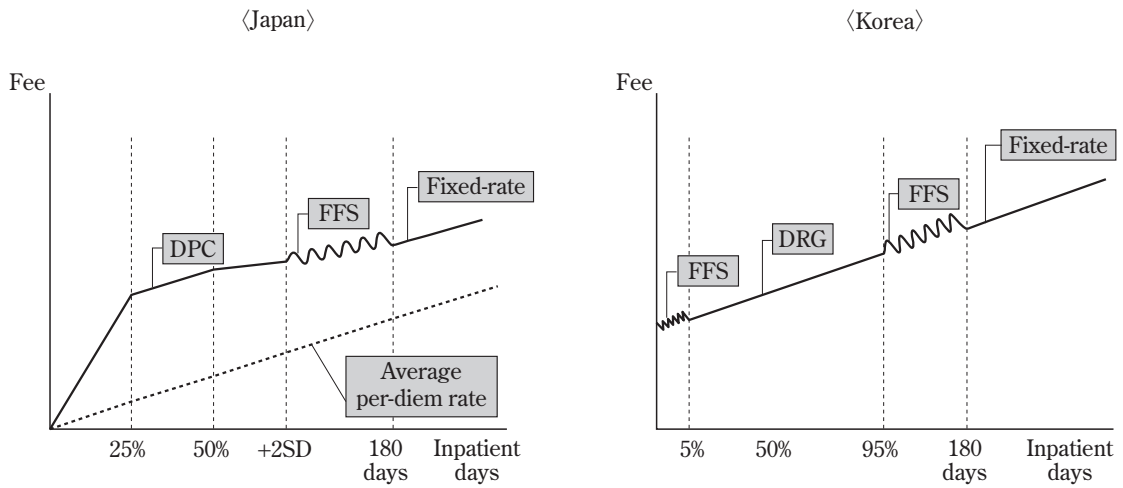


Figure 3. Fee Schedule of Japanese DPC and Korean DRG-based payment systems

4-2. Japanese DPC-based Payment

At this point, it is useful to refer to the Japanese DRG payment system, called Diagnosis Procedure Combination (DPC). Japan has introduced the system recently, despite the fact that Japan implemented this system after Korea had already begun experimenting with DRG. Fees for DPC are composed of a DPC component and an FFS component. The DPC component is calculated as a product of per-diem rate, hospital days, and hospital coefficient (see Figure 3). The per-diem rate varies by inpatient period: for period 1 (up to 25% of hospital days), 115% of the average per-diem rate is applied; for period 2 (from 25% of 50% of the average of hospital days), the average per-diem rate is applied; and for period 3 (from 50% of the average hospital days to two more standard deviations added to the average hospital days), 85% of the average per-diem rate is applied. For hospital days exceeding period 3, but up to 180 days, FFS payment is applied,; after 180 days, a fixed per-diem rate (equivalent to the average per-diem rate) is applied. The Japanese fee schedule, which is based on the hospital days, provides stronger incentive to shorten the hospitalization period than that of Korea, with their slopes of fee schedule varying according to hospitalization period, as shown in Figure 3.

The FFS component of the Japanese DPC system includes reimbursement for broad areas such as surgery, anesthesia, radiotherapy, rehabilitation, and psychotherapy. The DPC system has been applied to 82 teaching hospitals; this is in sharp contrast to Korea, where DRG system has not yet been applied to teaching hospitals. For this reason, Japan must include a significant proportion of FFS-based payment in its DPC system. The DPC component includes accommodation charges, checkups, and medications, for a total of approximately 15,000 items. The new HIRA plan appears to be heavily influenced by the Japanese DPC system in its mixing of FFS and DRG and introduces detailed diagnosis classifications in order to elicit positive responses from tertiary hospitals.

4-3. Criticism of HIRA's New Plan

Despite its attempts to appeal to providers and experts, the new plan was welcomed by neither of them. Providers insisted that the new plan be developed with the cooperation of providers, and contended that the bundling of sophisticated services is outdated and does not assure quality in care; as advanced countries have started to classify FFS items in more details. Moreover, providers emphasized that medical procedures are already standardized under the strongly regulated FFS system in Korea. Details on materials, devices, and pharmaceutical products to treat

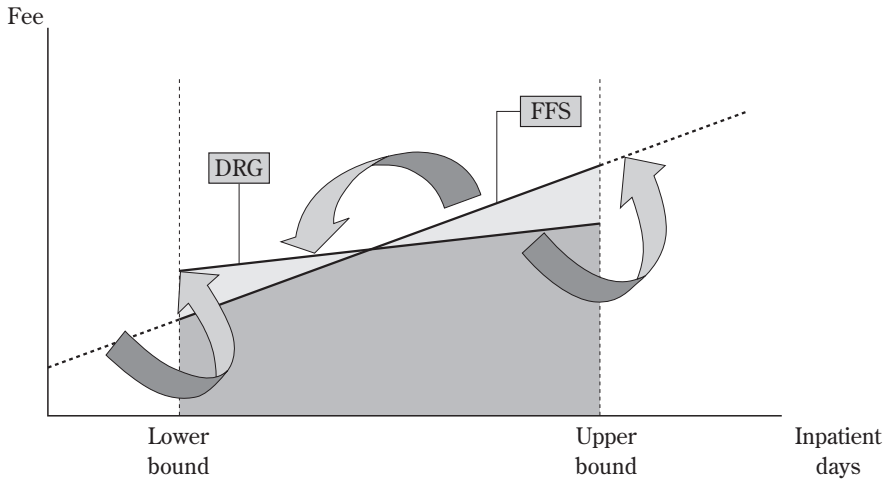


Figure 4. Provider's Strategies for Obtaining More Reimbursement

patients are regulated closely by health administration guidelines, and fees for all items, including procedures, drugs, and materials, are also regulated. Consequently, providers claim, the FFS system in Korea is already effective in achieving the goals of DRG-based system—for example, reduction of hospital days, one of the goals of the DRG system, has already been achieved over the past decade under the FFS system.

Health policy experts complained that the new DRG system will not encourage providers to be cost-effective, and they condemned the plan as sacrificing critical elements for the sake of encouraging the participation of hospitals. Moreover, experts criticized the new design as closer to per-diem payment system than case payment.

5. Introducing DRG-based payment

5-1. Back to the principle of DRG-based payment

DRG-based payment has been the subject of long-standing dispute between providers and the health administration. Of the options for containing rising health care costs, DRG-based payment seemed plausible to policy makers and received the widespread support of both progressive and conservative academic groups. The primary obstacle to the establishment of a DRG system has been the strong objections of providers. In response to providers' objections, policy makers and experts attempted to revise the DRG system, even at the expense of several crucial elements of the system.

HIRA's new plan may not be effective in controlling medical expenditures on an aggregate level. It allows for a large FFS component, and the reimbursement schedule could be manipulated for the benefit of providers. As seen in Figure 4, providers are likely to attempt to control the length of hospital stay under the new DRG payment schedule in order to increase their own benefits. For patients with a shorter than lower bound stay, providers are likely to extend hospital days a bit longer, resulting in more benefits for the provider. For patients whose hospital stay is near the upper limit covered by DRG-based reimbursement, providers are likely to hold patients beyond the upper limit so that they will be reimbursed by FFS payment, which is higher than DRG-based reimbursement. For patients between the lower bound and the upper bound, providers are likely to shorten the hospital stay of patients in order to increase the net revenue.

The expected attempt of providers to manipulate the length of hospital stay will undermine the efficiency of the

new plan. Under the new plan, more often than not, length of hospital stay will be extended in clinics and inefficient hospitals, and resources will be wasted for higher profits. At the expense of some managerial efficiency, the review process for the FFS component must be maintained, particularly to monitor shifting between the DRG and FFS components. Of course, administrative efforts should be directed to assess the adequacy of length of stay and the quality of care provided; quality of care should not be sacrificed for the reduction of cost. If quality of care deteriorates, negative effects could outweigh the benefits of the new system. Quality monitoring is very complicated in both implementation and the skills required, and, unfortunately, HIRA has little experience in quality management. The most practical problem facing the HIRA proposal is to reassure providers that the DRG system can sustain their profits at least to the level obtained under the FFS system. This depends primarily on whether providers can manage their institutions efficiently; however, except for a few tertiary hospitals, most institutions with inpatient facilities are too small to invest in a good management system.

5-2. Strategy for implementing DRG-based payment

It is essential to develop a strategy acceptable to providers, insurers, and experts without sacrificing the core elements of DRG-based payment. First of all, case-based payment should not be limited to a per-diem scheme. To obtain the agreement of providers, fee schedules should be designed differently for different providers—the existing differentiation between clinics, hospitals, general hospitals, and teaching hospitals must be discarded and replaced by a more sophisticated classification. Reimbursement should consider outcome-based performances, or "pay for performance" (P4P); in this regard, a "prize and penalty" system is recommended in which providers with good performance in both cost saving and care quality are reimbursed more than the scheduled fees, while those with below-average performance are given less than the scheduled fees (or, to avoid damaging the doctor's self-esteem, an amount equal to the scheduled fee). Such positive incentives may be effective for encouraging the participation of providers and are helpful in demonstrating that a DRG system will not necessarily impinge upon revenue. After reviewing these points, providers should become convinced that they will still be able to obtain adequate profits after implementation of the DRG system.

On the other hand, analysis of providers' behavior should be conducted under the current FFS system. This analysis should compare practice behavior and management structure of FFS providers with those of DRG providers and estimate the amounts of excessive and unnecessary services currently provided under the FFS system; in this way, excessive services and their resulting costs can be detected and the savings acquired from reducing waste can be shared by providers and insurers. In addition, demand in inpatient care, where many medical procedures accompany expensive and unnecessary checkups or examinations, materials and medicines, should be quantified. DRG-based reimbursement should cover as many services as it can, and will alleviate cost shifting from insurance coverage to non-insured services. This coverage expansion will reduce patient copayments and enhance access to care; however, this process should take place gradually. Selected new medical procedures and expensive non-medical services could be allowed, but these should be paid by the patients.

Under the current system, in which providers may choose between a DRG or FFS system, a good strategy is to treat providers using FFS unfavorably compared to those using DRG. Traditionally, providers have not been treated differently according to whether they use a FFS or DRG system, and most providers are comfortable under the FFS system, which has been used for a long time in Korea. In the future, stricter regulations should be enforced for providers using FFS, while lenient regulations (including only quality monitoring) should be placed on providers using DRG. With the introduction of an inpatient DRG system, simultaneous development of a case payment system for ambulatory care would be necessary. After several delays, the Health Care Financing Agency (HCFA) in the United States introduced an outpatient prospective payment system based on the Ambulatory Patient Group (APG) version 2.0 in August 2000. Fortunately, a Korean version of APG has been already developed (Park et al. 2006), ready to be implemented.

6. Concluding remarks

Since 1977, when social health insurance was first introduced in Korea, reimbursement to health care providers and the organizations for provider payment have been based on an FFS system. With the rapid development of information technology, the FFS-based system has also grown into a huge, extremely complicated system. All types of health care workers, including doctors, pharmacists, nurses, and managers, however, are now familiar with the FFS system. At the same time, almost all providers in the health care market have developed business models tailored closely to this system. Naturally, they tend to feel that the FFS system is a legitimate reimbursement system, well-suited to today's Korean health care market.

Under these circumstances, it is difficult to make the transition from FFS system to prospective payment systems like the DRG-based system, as it will require enormous amount of changes, and costs, in the entire health care industry. Such a transition may very well create chaos in the entire industry. It is very difficult to measure the social costs and social benefits of a payment reform. Korea had already experienced a serious one in the pharmaceutical reform of July 2000. In this reform, the government unilaterally mandated the providers to separated dispensing drugs from prescribing drugs for two objectives; one to control pharmaceutical costs, and, the other, to protect people from the overuse and misuse of drugs. This measure, however, resulted in unexpected doctors' strike, and serious social confusion, forcing the government to accept a compromise with the providers. Moreover, pharmaceutical costs have kept on increasing in spite of the reform, as a result of changes in physicians' prescription pattern. Learning from this failed attempt at reform is very important; future attempts should be very careful in designing a new DRG system and developing a strategy to enforce that system. We should be prepared for all possible negative effects and reactions, including provider backlash.

References

Ellis R and T McGuire. 1993. Supply-side and demand-side cost sharing in health care. Journal of Economic Perspectives 7: 135–51.

Fetter RB, Freeman J, Park H, Schneider K, Lichtenstein J, and Bauman W. 1989. DRG refinement with diagnostic specific comorbidities and complications: A synthesis of current approaches to patient classification. Final report. Volume I. Health Care Financing Administration Cooperative Agreement Nos. 15-C-98930/1-01 and 17-C-98930/1-0251. New Haven (CT): Health System Management Group.

Freeman JL, Fetter RB, Park H, Schneider KC, Lichtenstein JL, and Hughes JS. 1995. Diagnosis-related group refinement with diagnosis- and procedure-specific comorbidities and complications. Medical Care 33 (8): 806–827.

Coulam R and G Gaumer. 1991. Medicare's prospective payment system: a critical appraisal. Health Care Financing Review 13: S45–77.

Health Insurance Review Agency (HIRA). 2008. Future Plan for the DRG based payment system. May 2008.

Jung H-S. 2009. National health expenditure and national health account 2007. Ministry of Health and Welfare.

Kang G-W, H Park, and Y-S Shin. 2004. Refinement and evaluation of Korean Diagnosis Related Groups. Korean Journal of Health Policy & Administration 14 (1): 121-147.

Eggleston K and C-R Hsieh. 2004. Healthcare Payment Incentives: A Comparative Analysis of Reforms in Taiwan, South Korea and China, Applied Health Economics and Health Policy 3 (1): 47–56.

Kwon S. 2003. Payment system reform for health care providers in Korea, Health Policy and Planning 18 (1): 84–92.

Ministry of Health and Welfare (MOHW). 2000. Evaluation of the 3rd-year pilot program on DRG-based payment. Seoul: Ministry of Health and Welfare.

Park H-Y, G-W Kang, and Y Koh. 2006. Development and evaluation of Korean ambulatory patient group. Korean Journal of Health Policy & Administration 16 (1): 17–40.

Pauly M. 2000. Insurance reimbursement. In: Culyer A, Newhouse J eds. Handbook of health economics, volume 1A. North-Holland. 537–60.

Rogers WH, Draper D, and Kahn KL. 1990. Quality of care before and after implementation of the DRG-based prospective payment system: a summary of effects. Journal of the American Medical Association 264: 1989–94.

Shin Y-S, I-K Hwang, Y-K Yum, and D-H Lee. 1986. Fees for National Health Insurance and provider payment system:

application of DRG based payment and its model development. National Health Insurance Corporation. Seoul.

Shin Y-S, Y-S Lee, H-Y Park, and Y-K Yum. 1993. Korean Diagnosis Related Patients Groups for inpatient care. Korean Preventive Medicine 26（2）: 293–309.

Tchoe B. 1999. Study of the experiences on DRG based payment in United States and assessment on the pilot project for the introduction of DRG system in Korea. Korean Health Economic Review 5: 133–154.

Reforming Public Long-term Care Insurance and Caregiver Burden in Japan: How to Relieve Care Cost

Fumiaki Yasukawa, Ph.D.*

Abstract

Public long-term care insurance was first introduced in Japan in 2000. Along with increasing the volume of benefits provided by insurance, a recent reform of public long-term care insurance de-emphasized home care for elderly individuals and eliminated coverage for housing and food expenses. At the same time, income has decreased in elderly households and the income gap among Japanese has gradually expanded. Introduction of policies reducing the number of hospital beds and promoting home care settings is narrowing individuals' opportunities to receive insurance benefits while simultaneously increasing the economic burden placed on caregivers.

In this paper, I aim to identify the possible actions caregivers faced with increasing care costs may take in order to alleviate their care burden, and clarify whether private long-term care insurance can relieve caregiver burden. Econometric analysis revealed that 1) for those caring for elderly relatives, withdrawing money from savings, changing jobs, and purchasing private insurance have no significant effect on net income level; 2) younger individuals tend to change jobs in order to improve their situation; 3) changing jobs is selected significantly more often than withdrawing money from savings in home care cases; 4) those not requiring care tend to favor high premium-high reimbursement private long-term care insurance; and 5) private long-term care insurance plans providing sufficient compensation and approval-related benefit schemes may be favored by caregivers

Preparing for the huge costs of long-term care by saving or changing jobs may be quite unpredictable under the current trends of economic instability and differences in income expansion. Therefore, the role of private long-term care insurance in supplementing public insurance may be significant. However, no new private long-term care insurance plans exist in the market. It is therefore necessary to examine the reform of public long-term care insurance and introduce flexible measures such as cash payment schemes.

[**Keywords**] public long-term care insurance, private long-term care insurance, supplemental insurance, savings, multinomial logit model

1. Introduction

Public long-term care insurance was introduced in Japan in April 2000. Under the new system, the volume of benefits has expanded, as the supply system was established over time. The data from the Ministry of Health, Labour and Welfare indicate that payments reached some 6,500 billion yen in 2006, including both care services (totaling insurance benefits + public payment + self-coverage) and preventive benefits. Although this situation suggests that the public long-term care insurance system has come into maturity, it also reveals a serious problem in the increasing

* Professor, Faculty of Law Kumamoto University

financial burden needed to sustain care services, which will at some point be necessary for all individuals. "Incremental burdens of long-term care" refers not only to the increasing costs and insurance premiums for those receiving care, but also to the increased financial and emotional burdens caused by changing household structure, the shifting balance between work and home life, and fluctuating income levels, and the resulting actions taken by those receiving and giving care.

In principle, public long-term care insurance (through an insurance scheme) serves to support individuals in the event of health problems during the course of aging. In reality, however, the economic burdens accrued by persons requiring care are not necessarily paid completely by the individual receiving the care—burden is often transferred to children, grandchildren, siblings, and other relatives. Although care services are provided to those requiring care based on the principle of benefits in kind, it is clear that the essence of care services lies in relieving families' burdens (both financial and non-financial). The current public long-term care insurance policy, however, does not allow family members to receive direct cash payment due to mistrust of families' and spouses' interests.

Consequently, the issue of care burden is more precisely an issue of burden on the families (or household members) of persons requiring care. Therefore, the question of how to relieve this burden has become an important focus of current discussions on public long-term care insurance.

The present study aims to clarify the extent to which household members of persons receiving public care services feel financially burdened, and what specific measures household members can take to alleviate this burden. In particular, if the costs of public care services are large, several financial options are available. Among these, this study seeks to examine the plausibility and effectiveness of private insurance as a supplement to public long-term care insurance by clarifying the practicality of private insurance compared to other options such as withdrawing savings money and changing jobs.

In the first section of this article, I will review recent changes in Japan's household structure (especially in elderly households) and income level, and other basic values concerning trends in long-term care costs. In the second section, I will examine the progress of public long-term care insurance in Japan and the actual status of care costs. The third section presents simplified models of caregivers' behavioral responses to care burden, and the results of econometric analysis using individual data obtained through an original questionnaire survey, as well as several policy implications, will be discussed in the fourth section. I will conclude with a discussion of requirements for future public policy and private markets in response to the expected expansion of care burden based on the analytical results.

I. Socio-economic Circumstances of Long-Term Care in Japan

In the 8 years since public long-term care insurance was established in Japan, the care service supply system has developed steadily; however, fears have emerged that the financial resources for this scheme will soon run short due to expanding care costs. This is not only due to an increase in the number of persons requiring care, but also because demand for care has expanded along with the development of the care service supply system and improvements in the availability of services. It must also be noted that elderly households of singles and couples are increasing in number in Japan, and, as the average income level of elderly households in Japan is declining, these households are often barely able to survive on the maximum level of care services.

Table 1 shows changes in Japan's household structure stratified by household type. Since 1972, the total number of households has increased consistently. The largest cause for this increase is expansion in elderly households. Table 2 shows changes of elderly households. Clearly, the rapid increase in elderly households observed since 1975 has comprised primarily households of singles or couples only. Although not all elderly households (of singles or couples only) have health problems or require care, many potential care recipients live by themselves or with only their spouse to support them. In this sense, it can be said that Japan's rapidly aging society is less a problem of aging individuals than of aging households and families.

Table 1. Annual changes in number of households（by household type）

Year	Total households	Aged households	Mother and child	Father and child	Other households
Estimated number（Unit: thousand households）					
1972	31,925	1,380	363	74	30,108
73	32,314	1,521	359	76	30,359
74	32,731	1,520	381	81	30,750
75	32,877	1,089	374	65	31,349
76	34,275	1,282	416	70	32,508
77	34,414	1,288	399	82	32,645
78	34,466	1,368	432	82	32,584
79	34,869	1,577	442	78	32,771
80	35,338	1,684	439	95	33,121
81	36,121	1,779	465	90	33,787
82	36,248	1,851	463	97	33,837
83	36,497	1,949	485	106	33,956
84	37,338	2,100	514	107	34,616
85	37,226	2,192	508	99	34,427
86	37,544	2,362	600	115	34,468
87	38,064	2,517	526	98	34,922
88	39,028	2,704	567	119	35,637
89	39,417	3,057	554	100	35,707
1990	40,273	3,113	543	102	36,515
91	40,506	3,592	537	95	36,282
92	41,210	3,688	480	86	36,957
93	41,826	3,913	493	83	37,338
94	42,069	4,252	491	90	37,236
95	40,770	4,390	483	84	35,812
96	43,807	4,866	550	85	38,306
97	44,669	5,159	535	79	38,895
98	44,496	5,614	502	78	38,302
99	44,923	5,791	448	88	38,596
2000	45,545	6,261	597	83	38,604
2001	45,664	6,654	587	80	38,343
2002	46,005	7,182	670	86	38,067
2003	45,800	7,250	569	73	37,908
2004	46,323	7,874	627	90	37,732
2005	47,043	8,349	691	79	37,924

Source: National Livelihood Survey 2006, Ministry of Health, Labour and Welfare

If elderly singles are able to receive social services at any time, their socioeconomic risks may be hedged. In reality, the income of elderly households is expected to decline or be dispersed among more individuals as individuals age（Tables 3 and 4）.

Table 2. Annual changes in number of elderly households（by household structure）

Year	Total number	Singles			Couples	Others
		Sub-total	Male singles	Female singles		
Estimated number（Unit: thousand households）						
1975	1,089	611	138	473	443	36
1980	1,684	910	192	718	722	52
1986	2,362	1,281	246	1,035	1,001	80
1989	3,057	1,592	307	1,285	1,377	88
1992	3,688	1,865	348	1,517	1,704	119
1995	4,390	2,199	449	1,751	2,050	141
1998	5,614	2,724	555	2,169	2,712	178
2001	6,654	3,179	728	2,451	3,257	218
2002	7,182	3,405	755	2,650	3,563	214
2003	7,250	3,411	776	2,635	3,594	245
2004	7,874	3,730	906	2,824	3,899	245
2005	8,349	4,069	1,010	3,059	4,071	209

Source: National Livelihood Survey 2006, Ministry of Health, Labour and Welfare

Table 3. Annual changes in average income per household and per household member

Year	Average income per household（thousand yen）	Average income per household member（thousand yen）	Average number of household members（persons）
1985	4,933	1,446	3.41
86	5,056	1,492	3.39
87	5,132	1,551	3.31
88	5,453	1,640	3.33
89	5,667	1,746	3.25
90	5,966	1,836	3.25
91	6,288	1,978	3.18
92	6,478	2,071	3.13
93	6,575	2,111	3.12
94	6,642	2,164	3.07
95	6,596	2,192	3.01
96	6,612	2,258	2.93
97	6,577	2,227	2.95
98	6,552	2,226	2.94
99	6,260	2,198	2.85
2000	6,169	2,121	2.91
2001	6,020	2,135	2.82
2002	5,893	2,047	2.88
2003	5,797	2,034	2.85
2004	5,804	2,033	2.85

Source: National Livelihood Survey 2006, Ministry of Health, Labour and Welfare

Table 3 indicates that the average income level per household declined by as much as 12.6% in 2004 from its peak in 1994. The income level per household member also declined by nearly 10% from its peak in 1996. The income level remained relatively high until around 1997, reflecting the upward trend in consumer prices seen during those years[1]. However, consumer prices have been declining by around 1% per year over the past few years, while the income level has declined by over 10%, presumably tightening living costs and escalating care burden.

II. Trends in Care Costs and Long-term Care Insurance Reform

Let us now review the present status of public long-term care insurance. Japan's public long-term care insurance scheme went into effect in April 2000, providing care services either at recipients' homes or at care facilities. Figures 1a and 1b show changes in care insurance benefits over the 3 years between April 2000 and January 2003, at an early stage of the scheme, and over the 1 year between May 2005 and April 2006. The monthly amount of insurance benefits totaled some 200 billion yen, including home and facility services, during the early stage, rising to 400 billion yen after 2 and a half years. Subsequently, the monthly benefits increased gradually, reaching some 530 billion yen in May 2005, peaking at 570 billion yen in September 2005, and then taking a temporary downward turn. This downward turn of benefits in FY2005 was caused by the revision of the Long-Term Care Insurance Law, which shifted housing and food expenses in facility care（especially at special care nursing homes, health care facilities for the elderly, and medical care facilities）to uncovered services. Naturally, this revision succeeded in reducing insurance benefits, but residents suffered a sudden expansion in basic housing expenses. One estimate suggests that the monthly coverage rose from 56,000 yen to 104,000 yen for residents of conventional private rooms at special care nursing homes, and to 81,000 yen for residents of twin rooms.

Another trend is that the present pattern of benefit allocation differs from the early days of public long-term care insurance, when benefits paid to recipients of facility care were nearly 250% larger than those paid to home care recipients. Recently, this difference has diminished, and the proportions of facilities and homes were reversed—at least in terms of insurance benefits—following the revision. This change is significant for two reasons. First, the balance of financial resources for care services should be restored by reviewing the allocation of long-term care insurance benefits. Second, the financial resources required to support Japan's long-term care scheme should be shifted to family labor and financial power. In other words, options available to caregivers for responding to increasing financial burdens will become increasingly important.

Following the shift of housing and food expenses to uncovered services in October 2005, additional review and revision of care services took place in 2006. Again, the basic principle of the revision was the improvement of "self-support" by caregivers. More specifically, Regional Comprehensive Support Centers reviewed past preventive benefits（service benefits to persons certified as requiring support）and shifted these benefits to rehabilitation services at facilities and care services provided at home. Another new development was reinforced emphasis on "local" care services, which were reorganized local community-based services. This revision aimed to accelerate the shift from facility to home care by establishing a home care service environment.

Looking at these reforms of the long-term care insurance scheme, it is expected that the emphasis on home care services will continue to increase in the future, meaning elderly individuals requiring care will need to find an adequate care facility after leaving the hospital or nursing home. From the point of view of family members, this is equivalent to a lack of "shelter" in the case of an emergency, as well as a "respite" for caregivers, whatever its political justification may be. It is anticipated that family members will suffer mental burden due to uncertainty and worry in addition to increased financial burden.

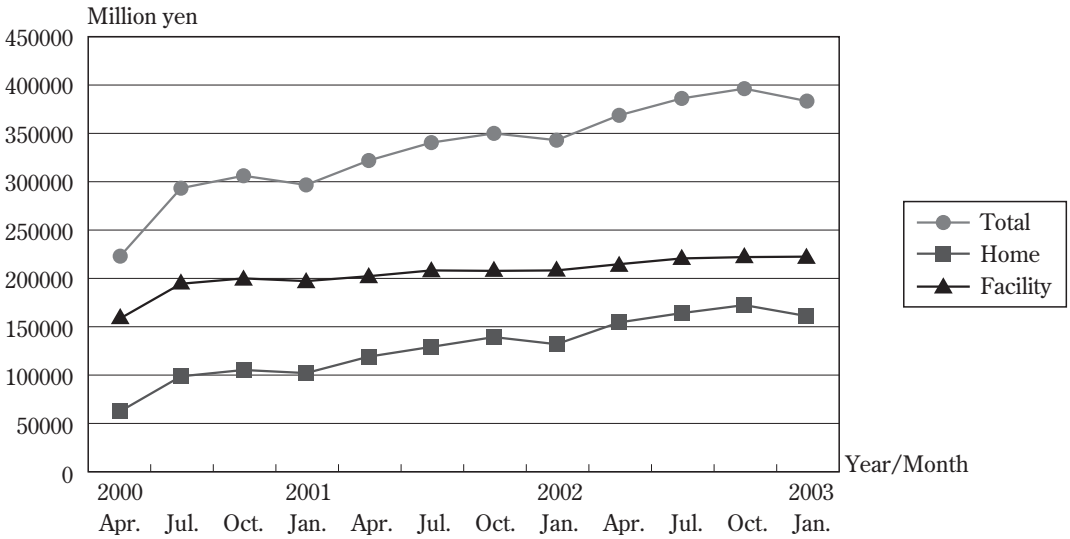
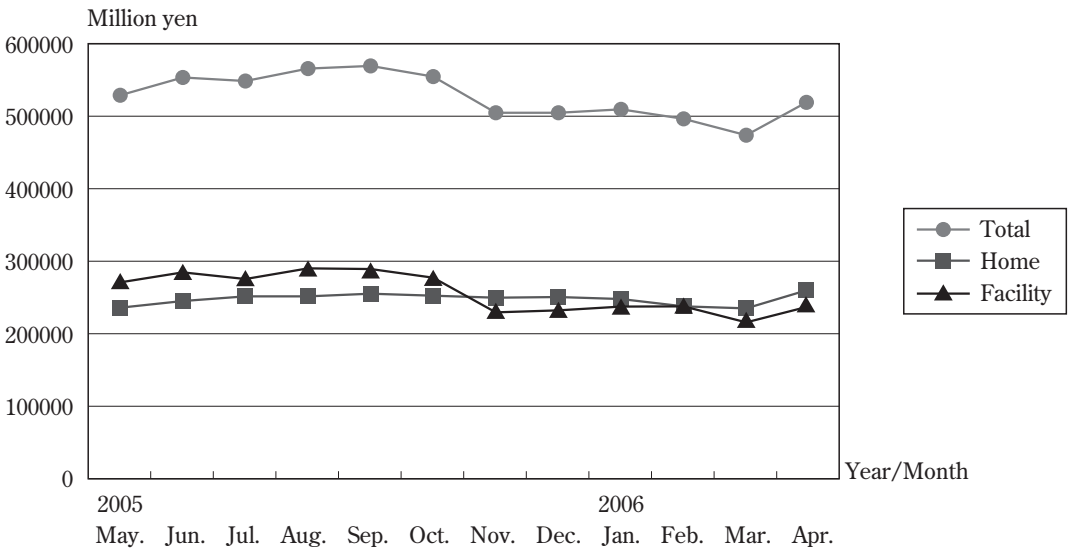


Figure 1a. Sequential changes in public long-term care insurance benefits (April 2000 – January 2003)



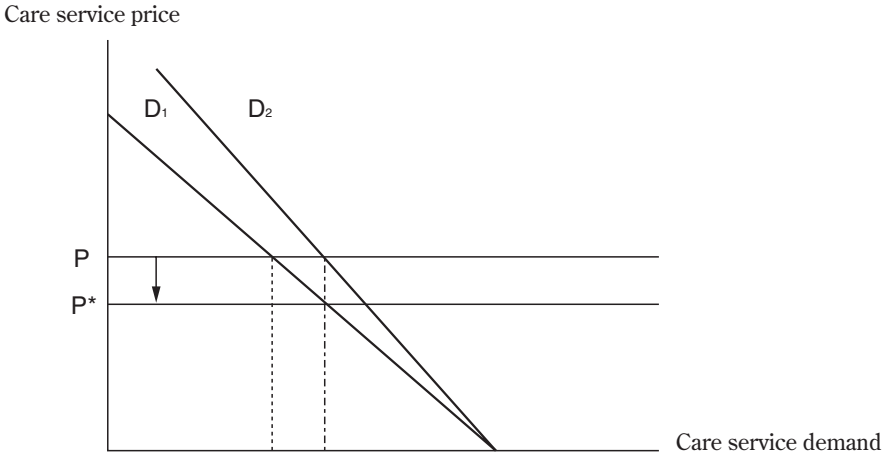
Data: Public Long-Term Care Insurance Report, Ministry of Health, Labour and Welfare

Figure 1b. Sequential changes in public long-term care insurance benefits (May 2005 – April 2006)

III. Increasing Caregiver Burden and Behavior Models

1) Systematic response to increased care burden

Possible options to relieve care burden include reduction of self-coverage for service benefits and providing separate financial assistance to caregivers (families). An example of the former is setting a limit for housing expenses in facility care according to the family's income level, while family care benefits provided by the German long-term care insurance system are an example of the latter. Under the current Japanese system, most care benefits



D1=Demand curve with the self-coverage reduction policy
D2=Demand curve with the cash benefit payment policy

Figure 2. Relationship between care cost and demand for care services

are not provided in cash to prevent misuse of benefits by caregivers; the only benefit services provided in cash are home remodeling and welfare equipment expenses, which, according to recent data, make up only about 1.1 and 0.4% of home care service expenses, respectively[2]. Occasionally, however, local governments provide very small amounts of supplemental cash benefits that are not provided by public long-term care insurance. This system is targeted at families caring for persons certified as requiring care Level 3 or above for at least 15 days at home. The amount allocated under this system varies widely, ranging from 5,000 yen to over 20,000 yen per month. This service is estimated to have several hundreds of thousands of recipients throughout Japan[3].

The respective effects of reduction of self-coverage and cash benefit payment are shown, in simplified form, in Figure 2. With the self-coverage reduction policy, care service prices will change from **p** to **p***, causing an increase in demand for services without changing the users' demand curve itself. In contrast, with the cash payment policy, prices remain unchanged, though the slope of the users' demand curve itself changes. The reason the current scheme does not provide cash benefits is likely to avoid enlargement of the slope of the demand curve, and because prices and service demand are more difficult to control when using cash payments

2) Caregiver behavior models in response to increasing care costs

The above argument focuses only on the relationship between care service prices and service demand, and does not provide any information on how to relieve mid- and long-term financial care burden on caregivers. The present paper seeks to determine ways to relieve the financial burden caused by continuous care, and to clarify the options available to caregivers themselves. More specifically, the present analysis aims to elucidate the optimal combination of assets and consumption for families or households in the event that a household member requires long-term care.

Figure 3 illustrates the scenario of a household facing the need for care at a specific point within the period **t**. The household member who is a potential recipient of care services has paid cost **C** to receive care services. In this household, the caregiver is the only income earner and has earned a specific income **Y**. The income earner has also taken out a private supplemental insurance（such as care service cost insurance）**I** to cover costs until the receipt of public insurance is approved. The potential care recipient actually begins to receive care at point **t***, after which the care cost changes. The actual cost is determined by the benefit levels of the public long-term care insurance and supplemental insurance. At this point, the income earner and caregiver face the problem of minimizing financial

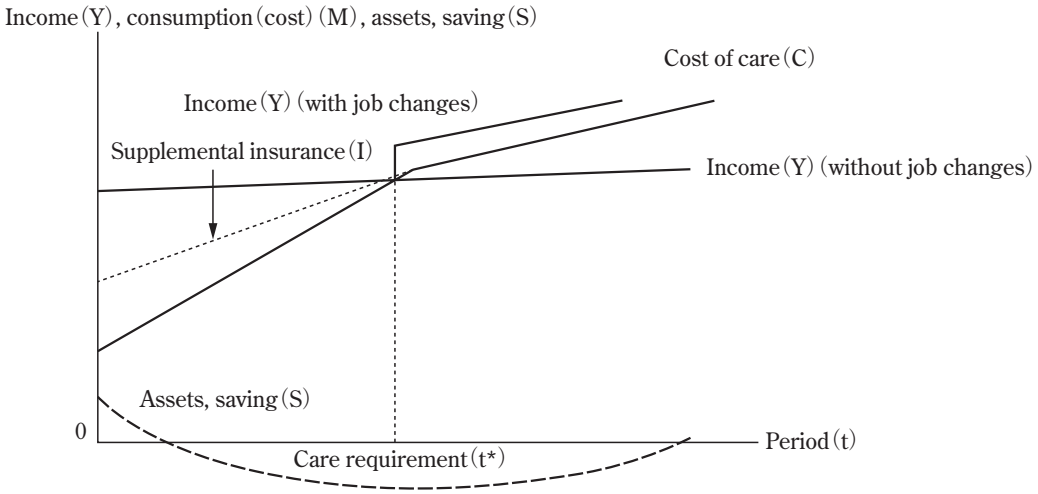


Figure 3. Care cost and financial burden in terms of life events

burden (= maximizing Y minus M) given a specific care service cost. To this end, the income earner could look for a new job with a higher salary (=obtain additional income by changing jobs), withdraw savings or liquefy assets, purchase additional insurance, and/or take other measures.

Using the decision-making variables described above, the budget conditions of a household are given by:

$$Y = W + S + I - M \tag{1}$$

Where **Y** is the total income of the household, **W** is income received from employment, **S** is savings and other assets, **I** is benefits obtained from private insurance, and **M** is household consumption (for simplicity, taxes and public duties such as public long-term care insurance premiums are ignored). Income received from employment refers to the total income paid by the income earners employer opted in the probability **q**, and is given by:

$$W = \Sigma q_{iw} \quad i = 1,2,\ldots,n \quad \Sigma_i = 1 \tag{2}$$

Where α represents the care requirement expression probability, and **Z** is the total consumption on goods and services other than care. Household consumption is given by:

$$M = \alpha C + Z \tag{3}$$

Where **r** represents the probability that the request for care services is approved, **H** is the relevant benefits, and **p** is the relevant premiums. The total benefits paid by private insurance are given by:

$$I = rH - p \tag{4}$$

The caregiver, who must look after the care recipient, is required to maximize the performance of the provided care services, under the restriction that the household's total consumption, including care costs, does not exceed the household's total income. For simplicity, the household in this scenario is assumed to have no debts or loans; however, in reality, many households do have debts and loans, which might cause the net savings amount to become

negative after balancing with care costs.

$$Max\ (qw + rH + S - (p + \alpha C = Z)) \quad (5)$$
$$s.t.\ \ Y \geq \alpha C + Z$$

When an actual caregiver faces increases in care costs, realistic options include:

1) Withdrawal of savings to supplement increased expenses (Operation S^*)

2) Changing to a job with higher salary (Operation W^*)

3) Purchasing private insurance (Operation H^*)

Note that care costs are not necessarily a "passive" burden. If children care for their aging parents, the strong ties and motivation to provide care among family members could be evaluated positively. In such cases, the "active" coverage of care burden and its maximum use should be examined in detail.

Based on the above formulae, the following sections will analyze the present status of caregivers' decision-making concerning $\mathbf{S}^*$, $\mathbf{W}^*$ and $\mathbf{H}^*$, using micro data including care costs and income information from actual households requiring care.

IV. Verification of caregiver responses to care costs

1) Preceding literature

Many researchers have studied the financial effects and requirements of long-term care insurance. The fundamental points of interest of these previous studies can be categorized as:

- The influence of care costs on demand for care services;
- The influence of financial burden on household living and how to relieve care burden; and
- The influence of the financial status of the insurer and the soundness of household living on supply and demand for care services.

Regarding care cost as the price of care services, the first point requires examination of the price resilience of care service demand (in other words, actual measurement of the rate of change in the demand curve in Figure 2 in proportion to the price). Preceding studies on the resilience of care service price (and income) include Suzuki and Ohkusa (1999), Ohkusa (2002[a]) (2002[b]), and Shimizutani and Noguchi (2004).

The second point asks to what extent care insurance can relieve increases in financial burden, assuming that demand for care services exists at a specific level regardless of its price. The second point also asks what supplemental measures should be taken to satisfy care demands not met by care insurance alone, how caregivers should make decisions regarding such measures, and what measures caregivers should take on their own. Few analyses have been conducted regarding these questions using objective data.

Preceding studies on the third point include Iwamoto, Obara, and Saito (2000), Shimizutani and Inakura (2006). The analysis by Iwamoto et al. was conducted before public long-term care insurance was introduced in Japan. The study by Shimizutani and Inakura focused on the suspected influence of the insurer's financial status on the approval of care and the use of care services, and its negative effect on the principle of national integration.

2) Verification analysis pertaining to care costs and reduction of caregiver burden

(1) Estimation models

This subsection will confirm, using actual data, caregivers' efforts to relieve increasing financial burden, and the maximization of the effect of care through caregivers' decision-making. In particular, this section focuses on factors affecting the three options introduced in the previous section (**withdrawing savings money, changing to a job**

Table 4. Hypothesis on results of analysis

		Expected effect		
		Withdrawal of savings	Changing jobs	Taking out insurance
Explaining variable	Explained variable	A person who need care in the household		
	Sex（Female）	?	?	?
	Age	+	−	− ?
	Attribute of the person who need care（Father）	+	?	?
	Ditto （Parents）	+ ?	?	?
	Net income	−	+ ?	+
	Place of care（home）	−	+	?
	Certified level of care requirement	?	?	+ ?
	Will to pay insurance premiums	?	?	+
	District dummy（Tokyo）	+	+	+
	District dummy（Kyushu）	−	− ?	− ?
		No person who need care in the household		
	Sex	?	?	?
	Age	+ ?	−	−
	Income	− ?	− ?	+
	Reason for taking out insurance			
	Inexpensive premium			+ ?
	Lifetime insurance			+ ?
	Sufficient compensation			+
	Saving type			?
	Easy insurance conditions			+ ?
	Approval-related benefits scheme			+
	District dummy（Tokyo）	?	?	?

with a higher salary, and purchasing private insurance). As described below, it is impossible to clearly determine whether decisions made by caregivers have been already put into practice through available data. Therefore, it is assumed that caregivers choose their behaviors depending on the current status of care. As an estimation model that matches this objective, a Multinominal Logit Model was used for analysis.

(2) *Data*

At present, the monthly amount of insurance benefits by service type can be obtained from the Monthly Report of Long-Term Care Benefits Status Survey of the Ministry of Health, Labour and Welfare of Japan. However, there are no statistics enabling objective identification of actual care costs for households or heads of households, or the actual behaviors of household members. Therefore, in this study, required data were collected using an original questionnaire. The questionnaire survey asked questions on the individual attributes of caregivers; present income level; types of care services used; care costs（covered by the households themselves）in the previous month; specific responses to increases in care costs（choice of one response）; additional costs（covered by the households themselves）that households are willing to pay to receive the same level of care they are currently receiving; and expectations of future increases in care costs（a kind of "Will to Pay（WTP）"）.

Between October and early November 2007, questionnaire surveys were sent to 1,000 research monitors

Table 5. Descriptive statistics of collected data and simple tabulation（1）

Age	Oldest	69	Place of care	Home	166
	Youngest	20		Facility	122
Sex	Female	318		NA	6
	Male	311	Type of service received		
Care recipient	Yes	294	Service	Number	%
	No	335	Home help	66	60.2
Income class	number	%	Visiting care	30	18.1
Below 5 million	233	37.0	Visiting rehabilitation	18	10.8
5 million to below 6 million	72	11.4	Visiting bath	23	13.9
6 million to below 7 million	61	9.7	Nursing instruction	20	12.0
7 million to below 8 million	55	8.7	Day service	99	59.6
8 million to below 9 million	33	5.2	Facility rehabilitation	28	16.9
9 million to below 10 million	38	6.0	Short stay	42	25.3
10 million to below 12 million	36	5.7	Rental welfare equipment	63	38.0
12 million to below 15 million	27	4.3	Welfare equipment purchase expenses	40	24.1
15 million to below 20 million	20	3.2	Home remodeling expenses	36	21.7
20 million or over	15	2.4	Paid home housing expenses	2	1.2
NA	39	6.2	Group home housing expenses	0	0.0
Care status	Number	%	Home care expenses	42	25.3
Support required 1	16	5.4	Preventive visits	2	1.2
Support required 2	29	9.9	Special nursing home	44	36.1
Care required 1	31	10.5	Health centers for the elderly	37	30.3
Care required 2	40	13.6	Nursing care beds	19	15.6
Care required 3	56	19.0	NA	22	18.0
Care required 4	41	13.9	Person（s）who need care	Number	%
Care required 5	46	15.6	Mother	138	46.9
Unknown	35	11.9	Father	70	23.8
			Parents	12	4.1
			Grandfather	15	5.1
			Grandmother	44	15.0
			Other	15	5.1

registered at an Internet research company. Responses were obtained via the Internet and entered into a database as a data set for this analysis. Six hundred and twenty-seven valid responses were obtained, with a response rate of 62.7%. Respondents included both those with and without persons requiring care in their households; these two groups were distinguished and estimated separately in the analysis.

Prior to analysis, the expected results were drafted; the hypothesis on the results of analysis is shown in Table 4. The symbol "+" represents a positive effect, " − " a negative effect, and "?" an unknown effect.

(3) Descriptive statistics

Descriptive statistics of collected data（Descriptive replies + Simple tabulation）were as shown in Table 5.

descriptive statistics（2）

Range of benefits	Number	%
Well in range	89	30.3
Barely in range	103	35.0
Exceeding the range of approval	86	29.3
Other	16	5.4
Perceived burden	Number	%
Not at all	43	14.6
Relatively low	104	35.4
Neither	65	22.1
Relatively high	64	21.8
Extremely high	18	6.1
Cost / month	Number	%
Below 5000 yen	24	8.2
5000 to below 11000	29	9.9
11000 to below 17000	30	10.2
17000 to below 20000	22	7.5
20000 to below 27000	18	6.1
27000 to below 31000	12	4.1
31000 to below 36000	14	4.8
36000 to below 40000	13	4.4
40000 to below 50000	19	6.5
50000 yen or over	40	13.6
Don't want to tell	72	24.5
Unknown	1	0.3
Will to additional payment	Number	%
Below 5000 yen	354	56.3
Below 10000 yen	197	31.3
Below 15000 yen	30	4.8
Below 20000 yen	44	7.0
20000 yen or over	4	0.6

Response to burden	Number	%
Withdrawal of savings	103	35.0
Taking out private insurances	3	1.0
Using public services	22	7.5
Using mutual aid organizations	4	1.4
Taking care leaves	3	1.0
Changing jobs etc.	12	4.1
Receiving family assistance	69	23.5
Other	12	4.1
None	117	39.8
Preparation for the future	Number	%
Savings	31	9.3
Taking out private insurances	18	5.4
Changing jobs etc.	11	3.3
Promoting health	72	21.5
Purchasing inexpensive home	0	0.0
Other than the above	9	2.7
No preparation	224	66.9
Conditions for attractive private insurances		
Inexpensive premiums	233	69.6
Lifetime guarantee	203	60.6
Sufficient compensation	190	56.7
Savings	137	40.9
Privileges	80	23.9
Easy insurance conditions	103	30.7
Approval-related benefits scheme	93	27.8
Other	6	1.8
Insurance plan	Number	%
Low premium – low reimbursement	385	61.2
Medium premium –medium reimbursement	103	16.4
High premium - high reimbursement	39	6.2
Maximum premium – maximum reimbursement	14	2.2
Lump sum payment only	67	10.7
Other	21	3.3

Through these simple tabulations of data samples, the income class distribution seems to generally approximate the average income distribution in Japan. Places of care were split approximately equally between home and facilities. More than 70% caregivers seemed to be encountered difficulty in meeting their economic needs for care giving. In

Table 6. Estimated decision-making for relieving care costs for households requiring careLogit（L）& Multinomial Logit（ML）

	Withdrawal of savings (L)		Changing jobs (L)		Taking out private insurances (ML)	
Variables	Coeff	S.E	Coeff	S.E	Coeff	S.E
Sex (Female = 1)	0.2991	0.2804	0.6428	0.7009	-0.3667	0.2546
Age	0.0233	0.0142 *	-0.0996	0.0448 **	-0.0088	0.0128
Person who need care dummy (Father = 1)	-0.1558	0.3356				
Persons who need care dummy (Parents = 1)	1.6783	0.7094 **	1.7905	1.2698	-0.3574	0.6071
Net income (logarithm)	-0.0945	0.2258	-0.2091	0.4962	0.3722	0.3141
Burden ratio (1 – cost of care / total income)	-1.9201	2.0697	-3.6863	3.6133	-3.6731	1.7041 **
Place of care dummy (Home = 1)	-0.5133	0.2849 *	1.5592	0.6491 **	0.3133	0.2409
Level of care requirement	0.0461	0.0716	-0.2944	0.1871	-0.0528	0.0633
Perceived burden “Yes” dummy	0.9373	0.3191 ***	0.8962	0.7064	-0.1687	0.2972
District dummy (Tokyo = 1)	-0.4889	0.3922	0.5359	0.9819	0.7367	0.3282 **
District dummy (Kyushu = 1)	0.6601	0.6101				
Log likelihood	-161.7441		-34.3394		-285.8259	

n = 294
Level of significance: * < 0.1 ** < 0.05 *** < 0.01

addition, a substantial number of respondents did not take any particular actions to relieve care burden, nor were they prepared for future increases in care burden.

(4) Estimation results

Estimations for households with and without members requiring care are shown in Tables 6 and 7.

＜Measures for relieving care costs for households requiring care＞

A: Withdrawing savings money

- Effects of age: As expected, the caregiver’s likelihood of withdrawing savings money to alleviate care costs increased with age; however, the likelihood increased only about 0.02 points per year.
- Effects of attributes of care recipient: If only the caregiver’s father required care, the caregiver was not likely to withdraw savings money. However, if both parents required care, the likelihood of withdrawing savings money increased by 1.6 points.
- Effects of net income: Contrary to the hypothesis, net income did not directly influence the caregiver’s withdrawal of savings money to alleviate care costs.
- Effects of place of care: As expected, savings money was used most often in cases of facility care. The likelihood of withdrawing savings money to supplement care costs was about 0.5 points higher in cases of facility care, suggesting that place of care depends on the savings of caregivers（or care recipients）.
- Effects of level of care requirement: No statistically significant relationship between level of care requirement and the withdrawal of savings money was identified.
- Effects of perceived burden of care costs: A statistically significant relationship was identified between the perceived size of financial burden and the withdrawal of savings money—caregivers were more likely to use savings money if they believed their financial burden to be large.

Table 7. Estimated decision-making for relieving care costs for households not requiring care Logit（L）& Multinomial Logit（ML）

	Conditions for taking out insurances (ML)		Opting private insurances (L)	
Variables	Coeff	S.E	Coeff	S.E
Sex (Female = 1)	-0.8751	0.2504 ***	0.3492	0.4829
Age	-0.0163	0.0109	0.0297	0.0205
Income (logarithm)	0.6651	0.3022 **	0.0289	0.3073
District dummy (Tohoku)	-0.7001	0.6004		
District dummy (Kanto)	-0.7571	0.4238 *		
District dummy (Tokyo)	-0.1384	0.4610	-0.0586	0.6609
District dummy (Nagoya)	-0.7083	0.6232		
District dummy (Chubu)	0.0379	0.5687		
District dummy (Kinki)	-0.7136	0.4911		
District dummy (Osaka)	-0.2076	0.4890		
District dummy (Chugoku)	-0.3842	0.5499		
District dummy (Shikoku)	-2.1500	0.9999 **		
District dummy (Kyushu)	-0.2339	0.6358		
Inexpensive premiums			-0.3032	0.4868
Lifetime guarantee			0.6722	0.5336
Sufficient compensation			0.9615	0.5313 *
Saving type			0.2511	0.4705
Easy insurance conditions			0.4241	0.4784
Approval-related benefits scheme			0.8852	0.4865 *
Log likelihood	-300.8695		-73.2546	

	Withdrawal of savings		Changing jobs	
variables	Coeff	S.E	Coeff	S.E
Sex (Female = 1)	0.1718	0.3687	-0.5520	0.6269
Age	0.0031	0.0166	-0.0592	0.0348 *
Income (logarithm)	0.0476	0.2332	0.3186	0.4071
District dummy (Tokyo)	-0.3009	0.5633	0.4561	0.8146
Log likelihood	-109.7794		-45.7508	

n = 335
Level of significance: * < 0.1 ** < 0.05 *** < 0.01

・Geographic effects: No significant differences were observed due to geographic conditions（i.e., between urban and rural areas）.

B: Changing to a job with higher salary

・Effects of age: As expected, the rate of changing jobs was higher for younger income earners, and this effect was considerably larger than that of withdrawing savings. Changing jobs or starting part-time work seems to be quite difficult for older income earners.

・Effects of attributes of care recipient: No statistically significant relationship was identified between the attributes of the care recipient and the income earner's choice to change jobs.

- Effects of net income: Although positive effects were expected, no statistically significant relationship between income level and changing jobs was identified.
- Effects of place of care: Although positive effects were expected for home care, the results indicated that home care had a significant negative effect on the caregiver's choice to change jobs, suggesting that caregivers are able to change jobs more easily in cases of facility care.
- Effects of level of care requirement: A negative effect was observed, but with questionable statistical significance. It is possible that changing jobs becomes easier at lower levels of care requirement.
- Effects of perceived burden of care costs: Unlike the withdrawal of savings money, the level of perceived burden did not seem to affect changing jobs.
- Geographic effects: Although the labor market in urban areas was expected to have an effect on changing jobs, no such effects were observed in the present results.C: Purchasing private care insurance（opting for preferable plans）

C: Purchasing private care insurance (opting for preferable plans)

- Effects of age and attributes of care recipient: Neither age nor attributes of care recipient was observed to have a statistically significant effect.
- Effects of net income: Although income level itself was not found to have an effect, the mental effects of care costs on income（burden ratio（1 – care cost / total income））suggested that high premium-high reimbursement insurance was preferred when the perceived burden was light. In other words, it is possible that caregivers who perceive a strong care burden also perceive a strong burden due to care insurance premiums.
- Effects of place of care and level of care requirement: Neither place of care nor level of care requirement was observed to have a statistically significant effect on purchasing private insurance or on plan options. Consequently, it is possible that high premium-high reimbursement plans are chosen more often in those who have chosen home care setting.
- Effects of perceived burden of care costs: No statistically significant relationship was observed between perceived burden of care costs and private insurance plans.
- Geographic effects: In urban areas（represented by Tokyo）, high premium-high reimbursement plans were significantly more common than in other areas. This is an indirect effect of income—such plans are favored in urban areas, where the average income is higher than in rural areas.

＜Measures for relieving care costs for households not requiring care＞

A: Purchasing private care insurance (opting for preferable plans)

- Effects of sex and age: Effects of sex, which were not observed in the estimation for sample households requiring care, were observed for households not requiring care—male respondents preferred high premium-high reimbursement plans more strongly than female respondents. This is considered to reflect the higher proportion of male income earners compared to female income earners. As for the effects of age, younger respondents preferred high premium-high reimbursement plans more strongly, but the difference was not statistically significant.
- Effects of present income level: Similar to the results given above, respondents with higher income levels preferred high premium-high reimbursement plans significantly more often than those with lower income levels.
- Geographic effects: Using Hokkaido as a base region, the dummy values of other regions were estimated. A significant preference for low premium-low benefit or lump sum payment plans was noted in the Kanto area, excluding Tokyo and Shikoku. In other regions, no significant differences were observed as compared with Hokkaido.

Table 8. Factor analysis for households taking no measures in response to increasing care costs Logit

	No measures (with care need)			No measures (with no care need)		
Variables	Coeff	S.E		Coeff	S.E	
Sex (Female = 1)	-0.5152	0.2785	*	-0.3559	0.2484	
Age	-0.0061	0.0136		-0.0220	0.0111	**
Persons who need care dummy (Parents = 1)	-1.8561	1.0830	*			
Net income (logarithm)	-0.1781	0.1521				
Present income (logarithm)				0.0187	0.1216	
Burden ratio (1 – cost of care / total income)	3.1492	2.1999				
Place of care dummy (Home = 1)	-0.0711	0.2556				
Level of care requirement	0.0028	0.0691				
Perceived burden "No" dummy	1.4165	0.4076	***			
Perceived burden "Yes" dummy	-0.8956	0.3650	**			
District dummy (Tokyo = 1)	0.4317	0.3575		0.1482	0.4242	
District dummy (Kyushu = 1)	-0.4904	0.7103		1.2882	1.6682	*
Log likelihood	-163.401					

Level of significance: * < 0.1 ** < 0.05 *** < 0.01

B: Withdrawing savings money

C: Changing to a job with a higher salary

- Except the effects of age on changing jobs, no clear effects were observed for sex, present income level, or geographical region. Younger respondents were more likely to change jobs; however, this tendency is considered a general employment trend rather than a phenomenon particular to the cases examined in the present study.

<Factor analysis for households taking no measures in response to increasing care costs>

The objective of the present analysis was to identify the measures caregivers take in response to increasing care costs. However, many caregivers did not take any measures to alleviate care costs. Of the surveyed households, some 40% of those requiring care replied that they would "do nothing" in response to increasing financial burden. Of households not currently requiring care, nearly 70% replied that they are unprepared for future increases in financial burden. For this reason, it is important to identify the factors affecting the decisions of these households.

As for the analysis of households' actions in response to increased care burden, the analysis of households that did not take action was made separately for households with and without members requiring care using a logit model, as shown in Table 8.

As for the effects of sex and age, younger samples tended to take fewer measures in both groups. In particular, this trend was significant for households not currently requiring care. For households requiring care, caregivers were likely to take no measures if both parents required care. Naturally, caregivers were likely to take no measures if the perceived burden was minimal, while caregivers tended to take at least some measures when they perceived a strong burden. No clear differences between urban and rural areas were noted for households requiring care. In contrast, for households not currently requiring care, significantly fewer persons took measures in rural areas (represented by Kyushu).

3) Discussion and Implications

(1) *What are the most realistic ways to relieve care costs for caregivers?*

There is a clear trend for caregivers to withdraw savings money to alleviate care costs when they perceive a strong burden, regardless of their present net income level. However, withdrawing savings money is chosen less frequently in cases of home care. One characteristic of home care is that the caregiver and care recipient support one another within the household, making it difficult for the caregiver to withdraw savings only to cover care costs unless the care recipient also agrees (Parents dummy showed a significant positive effect). At the same time, a positive correlation is expected between the amount of savings and the caregiver's age—only relatively older persons have a substantial amount of money in savings that they can use to supplement care costs. In addition, elderly individuals are more likely to receive care at facilities and have a higher level of care requirement. Withdrawing savings money is considered to become a realistic way of coping with care costs if the caregivers themselves are relatively older and perceive a strong financial burden, and if the shift to facility care is possible using the savings of care recipients themselves. The option of changing jobs, in contrast, is closely tied to labor market conditions, and is more realistic when the caregiver is relatively young (age has a significant negative effect on the likelihood of changing jobs).

The present results suggest that, in order to alleviate care burden, changing to a job with a higher salary is a realistic option if the caregiver is relatively young; however, for a older caregivers, withdrawing savings money (including the parents' or care recipient's savings) may be the only viable option. Therefore, it is desirable to plan for such an eventuality as early as possible, since many persons fail to adequately prepare for the possibility of a family member requiring long-term care in the future when a strong financial burden is not immediately apparent.

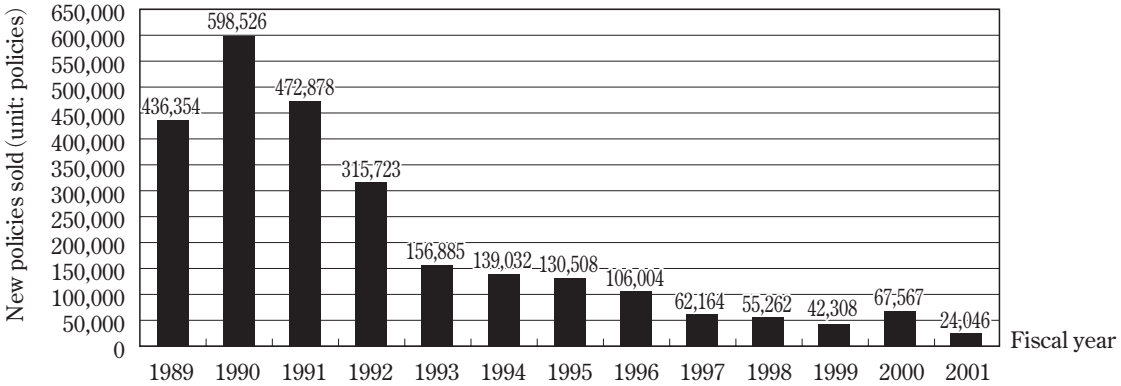
(2) *What preparations should persons who may face the problem of caring for a family member in the future make?*

For persons who are not currently caregivers but are likely to provide care to a family member in the future, it is extremely important to make a plan for relieving care costs in advance. The results of logit model analysis indicate that people's expectations of private insurance are as follows:

1) Guaranteed coverage if a family member develops a condition requiring care; and
2) Care benefits are paid automatically as soon as the care requirement is certified.

The multinominal logit analysis of preference for premium-benefit plans indicated that persons with higher income were significantly more likely to favor higher benefits, and that females were significantly less likely to prefer premium levels linked to a high level of benefits (e.g., monthly paid insurance benefits). This suggests that, for private long-term care insurance to operate effectively in the insurance market with the required number of policy holders and thereby contribute to the alleviation of care burden, it is necessary to provide plans covering care costs to a specific level as soon as care requirement is certified and with relatively low premiums. Private long-term care insurance was put on the market for the first time in 1989, reaching a peak after a very short period, and was phased out after 2001 (the year after the introduction of public long-term care insurance) due to its poor performance (Figure 4). As this incident suggests, if the private long-term care insurance market cannot provide sufficient insurance products, steady savings may be a realistic means of preparing for potential care burden.

As suggested earlier, considering declining income levels and expanding income gaps, it is difficult for younger generations to accumulate savings substantial enough to prepare for future care burden. Although younger people can change jobs relatively easily, there is no guarantee that changing jobs will help individuals to prepare for their own and their families' future care demands, even when corporate pension funds are shifted to defined contribution plans.



Source: Data from the General Insurance Association of Japan

Figure 4. Number of new long-term care insurance policies sold by non-life insurance companies

(3) How should the burdens and benefits of public long-term care insurance be changed in the future?

In both households with and without members requiring care, income level had no significant effect on withdrawing savings or on changing jobs. In other words, the income resilience of households' response to care burden is small. Therefore, it is reasonable to expect that care service demand does not vary substantially by income level. In contrast, many persons were likely to take no measures, even if they were experiencing care burden. This non-resilience of care service demand suggests that caregivers might not recognize potentially serious burden until they suddenly find themselves in a critical situation. Under the current long-term care insurance scheme, which does not provide a "shelter" of cash benefit payments to family members, the only alternatives are self-coverage or insurance premiums in line with income level, and there are no public relief systems for substantial subjective financial care burden, which is not linked to income level. If the present system is not reformed, Japanese people will be required to prepare for future care burden on their own or without close assistance from insurance schemes. In the examination stage before the establishment of public long-term care insurance, some commentators argued for the simultaneous implementation of both public and private long-term care insurance schemes[4]. This suggests that the limits of public long-term care insurance, as pointed out above, have been recognized to some extent.

Nevertheless, if it is difficult to develop insurance products that satisfy people's preferences for private long-term care insurance, as suggested by the present analysis, the incorporation of flexible benefit systems similar to those used in private long-term care insurance schemes may be beneficial. For example, if cash benefit payments to family members equivalent to the lump sum payments from private long-term care insurance are introduced, and if conditions for payment and the correlation with the range of subsequent benefits in kind are stipulated (for example, service benefits will be reduced by 10% for the 6 subsequent months to persons who have received a specified amount of lump sum payment), caregivers will have additional options for alleviating care burden. At the same time, accelerating the development of private long-term care insurance products that truly supplement public long-term care insurance, supported by adequate marketing, is a short-term measure that could help relieve caregivers' financial burden.

Conclusion

Using data collected through an original survey, the present study analyzed and quantitatively reviewed the ways in which caregivers alleviate the increasing financial burden of care, the measures caregivers consider for addressing

care burden, and relevant factors amidst the rising number of individuals requiring care and the declining income levels and expanding income gaps in Japan's aging society.

To relieve the financial burden of care, a number of actions are required in addition to efforts on the caregiver's side, such as promoting the health of elderly persons and developing equipment and systems that help individuals requiring care to live independent lives. The present study has several limitations in that it analyzed the financial burden of care only from the viewpoint of caregivers; the scale of data for analysis was small; and it did not examine changes in financial burden on the same caregiver over time. In the future, the relationship between care insurance systems and care costs, which have been analyzed primarily in the context of changes in care service demand, should be examined from the perspective of perceived financial burden and caregivers' responses to perceived financial burden. In the process, the characteristics of an ideal care environment for both caregivers and care recipients should be elucidated.

Acknowledgement

The present study was funded by a "Cultural and Postal Saving Foundation Research Grant" in 2006.

Footnotes

1 Data are from the Ministry of Internal Affairs and Communications and NIKKEI NET.
2 "The Policy Making Process of Long-term Care Insurance"(2007), Masaru Wada, ed.
3 Ibid., p.390
4 Ibid., p.440

References

1) Sakamoto, T., Sumii, H. edit. Economics and finances of long-term care, Keiso Syobo 2006
2) Suzuki, W., Ohkusa, Y. Econometric estimation of long-term care demand using Conjoint Analysis. Discussion paper of Osaka University Institute for Social Economics 1999; No486
3) Ohkusa, Y. Analysis of actual demand and supply generated by public long-term care insurance in Japan: estimation by household structures. Quarterly Journal of Social Security Research (Kikan Shakai Hosho Kenkyu) 2002a; Vol.38, No.1: 67-73
4) Ohkusa, Y. Estimation of demand elasticity in consuming long-term care services by introduction of public long-term care insurance. Quarterly Journal of Social Security Research (Kikan Shakai Hosho Kenkyu) 2002a; Vol.38, No.3: 239-244
5) Shimizutani, S., Noguchi, H. Price and demand elasticity in long-term care consumption: econometric estimation by using CVM and actual amount of services. ESRI Discussion paper 2004; 85
6) Ishida, N. Economic analysis of income security for elderly peoples. Toyo Keizai Shinpo sha 2007
7) Iwamoto, Y. Economics for social welfare and family. Toyo Keizai Shinpo sha 2001
8) Ministry of Health, Labor and Welfare. National Livelihood Survey
9) Ministry of Health, Labor and Welfare. Public long-term care insurance report. 200 and 2006

Author Contact

Fumiaki Yasukawa, Ph.D.
Faculty of Law Kumamoto University
2-40-1 Kurokami, Kumamoto 860-8555, Japan
Tel/Fax: 096-342-2370
E-mail: fyasu@kumamoto-u.ac.jp

Managing the Long-Term Care Market: The Constraints of Service Quality Improvement

Yoshihiko Kadoya*

Abstract

It is often said that the market mechanism does not enhance service quality in the care market because there is information asymmetry between users and providers. This research investigates the three arguments for this proposition by using the data of Group Home providers' service quality performance index in the Japanese Long-Term Care Insurance (LTCI) market. The three argument models are

a) The Contract Failure model that claims users perceive nonprofit providers as a sign of good service quality.
b) The Medical Arms Race (MAR) model that argues the competition in the care market tends to lower the service quality.
c) Suzuki and Satake's (2001) model that claims new entries in the care market do not contribute to improvement in the market's service quality.

Analyzing the quality performance by attributes, research has revealed that none of the three models was fully supported in the Japanese LTCI market. After testing the Contract Failure model, there was no significant difference in the service quality between for-profit and nonprofit providers but it reflected the market share of each type of provider. Regarding the MAR model, the service quality of the providers in competitive markets was significantly better than that of those in non-competitive markets. As for Suzuki and Satake's (2001) model, although new entry does not bring a more qualified service into the market for the initial year, new market entry providers improve the service quality more than old (existing) entry providers do.

Moreover, the research uncovered implications for each model. First, the service quality of nonprofit providers may appear better from the viewpoint of the care recipients, but this may be opposite to that of the family. Second, bridging the information gap prevents the market competition from MAR syndrome. This also creates an incentive for the providers in non-competitive markets to improve the service quality. Third, the weakness of new entry in service quality is care management rather than care service itself.

The research concluded that the market mechanism overall worked efficiently for the improvement of service quality in the Japanese LTCI market. This was attributed to the government's policies including a providers' third-party evaluation system that bridged the information asymmetry in the market.

[**Keywords**] contract failure, Medical Arms Race, long-term care, aged care, Group Home, service quality control, third-party evaluation, care market evaluation.

Introduction

As a result of the introduction of public long-term care insurance (LTCI) in 2000, the long-term care provision in

* PhD candidate, Graduate School of Government, The University of Sydney

Japan shifted from a "distribution system" to a "contract system." Since then, all insured eligible people have been free to contract care services with any provider in the market.

This research aims to investigate whether or not the market mechanism works efficiently in the Japanese LTCI market. The "efficiency" of the market mechanism is here measured as the care service quality under a fixed-price condition in the market in which the price competition is regulated. Thus, this research examines if the market mechanism enhances service quality in the LTCI market.

For the market mechanism to enhance service quality, three conditions are required: a) users choose a provider based on the service quality; b) the competition among providers enhances the service quality; c) new market entries bring a more qualified service into the market. The ideal market condition is, in other words, that users prefer a more qualified service and providers compete with each other to attract users. In addition, new entries come into the market knowing what the competition is about. Under these conditions the market is successful in terms of improving the service quality.

Nevertheless, there are three models that disagree that these conditions in the care market can be achieved, because of information asymmetry between the users and providers. They are a) Contract Failure model; b) Medical Arms Race (MAR) model; and c) Suzuki and Satake's (2000)[1] model. This project specifically examines the validities of these models, examining the mandatory third-party evaluation (*gaibu hyouka*) of 1,093 Group Home[1] providers in the Kanto area.

Literature Review

This section discusses the details of the above-mentioned three constraint models of service quality improvement in the care market.

The Contract Failure Model: The Users May Not Choose a Provider Based on Its Service Quality

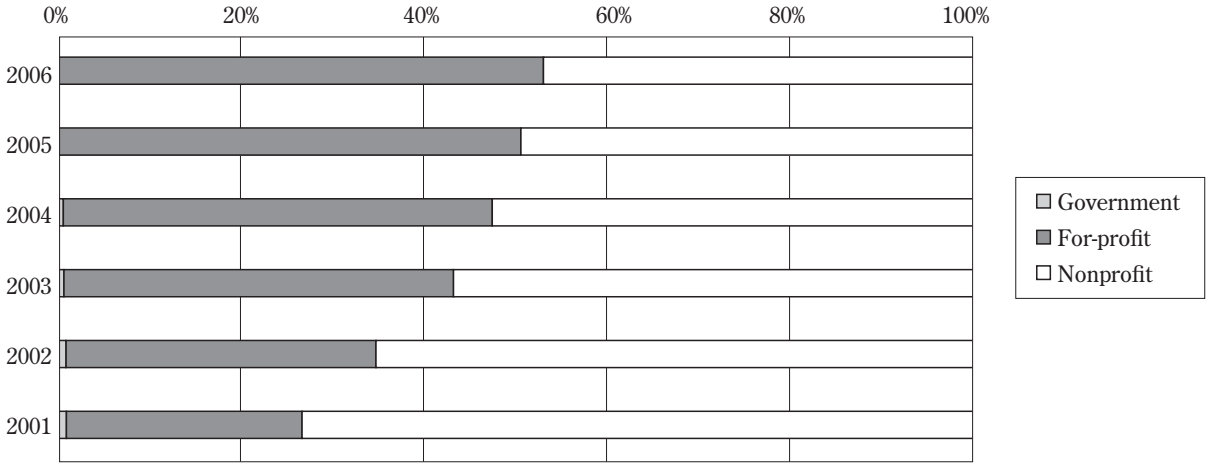
The Contract Failure model introduced by Hansmann (1980)[2] claims that in the care market users cannot choose a provider based on its service quality because there is information asymmetry between users and providers. Thus, the users see the ownership of providers as the signal of service quality; they choose nonprofit providers rather than for-profit providers which, they believe, tend to behave opportunistically (Hansmann, 1980; Hirth, 1999[3]).

However, this does not necessarily mean that the service quality of nonprofit providers is actually better than that of for-profits (Endo, 1995[4]; Suzuki, 2002[5]). There are three arguments for this proposition. First, due to the limitation of the ownership, nonprofits do not have the incentives to improve the cost-effectiveness and service quality as much as for-profits do (James and Rose-Ackerman, 1986)[6]. Second, the incentive to improve the service quality is difficult to identify regardless of the ownership of providers if the market is protected from price competition (Tuckman and Chang, 1998[7]; Nanbu, 2000[8]). Third, the development of information technology which minimizes the information asymmetry may benefit the for-profit providers (Ben-Ner, 2002)[9].

Many empirical studies reflect this dispute. On one hand, Weisbrod (1998)[10] and Cohen and Spector (1996)[11] investigated the long-term care market in the United States and concluded that the service quality of nonprofits was superior to that of for-profits. Gertler (1984)[12], who also surveyed the care market in the United States, claimed the opposite. However, Nyman (1988)[13] and O'Brien and Smith (1983)[14] concluded there was no significant difference. Endo (2006)[15] argued that these different outcomes stemmed from the absence of a clear definition of service quality.

Nevertheless, the hypothesis of "contract failure" may be true. Certainly, as Hansmann (1980) says, if the service quality of nonprofits is better than that of for-profits, the user's "signal" would be correct. That means there is

Chart 1 The transition of market share by the type of provider (as of October in each year)



Source: Ministry of Health, Labour, and Welfare (MHLW) (2007) [39] and Health and Welfare Statistics Association (2007; p. 189-191) [40].

no "contract failure." However, as seen above, the correlation between the provider's ownership and the service quality is still not clear.

The solution to this "contract failure" is for the users to be able to access service quality information from the providers. Hirth (1999) points out that repeat purchasing helps users to grasp the provider's service quality level. Although this may not be realistic in purchasing long-term care services, it is still important to fill the information gap between the users and providers as the information asymmetry is the condition of "contract failure."

The LTCI market in Japan has been actively involved in filling the information gap. Implementing the LTCI in 2000, the Japanese government has shaped a standardized service quality measurement and built a database of the evaluation outcomes. The optional third-party evaluation system (*daisansha-hyoka*) in 2003, mandatory third-party evaluation system (*gaibu-hyoka seido*) for community services in 2005, and LTCI information disclosure scheme (*kaigo service johou koukai seido*) in 2007 are examples of the measurement[2]. As for the database that makes the information available to the public, the Welfare and Medical Service Network (WAM-NET) system has been operating since 2001.

Nevertheless, the dispute over whether or not the ownership of providers affects service quality can be seen in Japan as well. Morozumi (2007) [16] surveyed Group Home providers for the elderly with dementia (hereafter, Group Home) in the Tokyo metropolitan area and Osaka city. She claimed that nonprofits provide better quality and users' transfers than those of for-profits because of diversification. Suzuki (2002), on the other hand, surveyed at-home care providers in the Kanto area in 2001 and claimed that there was no significant difference between the ownerships of providers in service quality. Yet, 75 percent of the market share in that year was occupied by nonprofit. Suzuki (2002) [17] pointed out that this was "contract failure." Six years after Suzuki's claim, the market share of for-profits increased to nearly 50 percent of the market share. Sakurai (2008) analyzed the service quality of Group Home providers in Kyoto and Shiga prefectures and claimed that there was still no significant difference between nonprofits and for-profits in service quality; he implied that the difference of service quality between nonprofits and for-profits reflected the share market (Chart 1). This meant there was no "contract failure" in the Japanese LTCI market.

This paper on this model aimed to rectify two deficiencies in previous research. The first was about the quality and quantity of the data to be analyzed. The sample size of the survey by Suzuki (2002) and Morozumi (2007) was only a few hundred (Suzuki: 437; Morozumi: 108), though those sample sizes were acceptable for the research environment at the time. Sakurai's (2008) research utilized the data in only two prefectures out of 47. The outcomes have left a question about the validity. The second aspect was about the investigation of the reasons for the dispute

over whether the ownership of providers influences the service quality or not. This paper analyzed the features of providers' ownership.

Medical Arms Race (MAR) Model: Competition May Not Enhance the Service Quality

The MAR model argues that the competition in the care market tends to lower the service quality. To be competitive in the market, providers spend money on advertising or renovation of building and equipment rather than improving the service quality itself (Hersch, 1984[18]; Luft et al., 1986[19]; Robinson, 1988[20]).

This model has been actively researched in the healthcare market in the United States and many providers have acknowledged the phenomenon. Defining competitiveness as market intensity[3], Wilson and Jadlow (1982)[21] claimed that the more competitive, the less technically efficient. According to Farley (1985)[22], care tends to be expensive at hospitals in competitive markets. However, Robinson and Luft (1985)[23] found it was the opposite. Zwanziger and Melnick (1988)[24] claimed that the phenomenon was because of the over-prescription of the hospitals in competitive markets. Devers et al. (2003)[25] and Berenson et al. (2006)[26] argued that over-prescription was spreading from medical treatment to the amenity of hospitals.

There are a few criticisms of the MAR model. Dranove, Shanley, and Simon (1992)[27] claimed that the hospitals in competitive markets needed to respond to the needs of high-tech medical treatment, introducing the latest equipment. Thus, it was natural that the treatment at such hospitals cost more and was not a matter of inefficiency. Moreover, by defining "service quality" as mortality, and "market competitiveness" by the Herfindahl-Hirschman Index (HHI), Shortel and Hughes (1988)[28] denied the correlation between service quality and market mechanism. Kessler and McClellan (1999)[29] also denied the hypothesis of the MAR model, claiming that market competitiveness lowered the mortality rate. As for the research on nursing homes in the United States, Gertler and Waldman (1992)[30] claimed that market mechanism enhanced the service quality; Nyman (1994)[31] criticized the policy that regulated nursing homes' capacity in order to avoid the MAR syndrome, claiming that the policy discouraged providers' efforts to be effective.

There is little research on this issue in the Japanese LTCI market. The notable exceptions are the theoretical research of Nanbu (2000) and the empirical study of Zhou and Suzuki (2004)[32]. Pointing out that there is no price competition in the market, Nanbu (2000) discussed the possibility that the market competition would lead the providers to compete for a better service quality, not just rent seeking and advertising. Zhou and Suzuki (2004) surveyed the long-term care providers in the Kanto area in September 2001, right after the Japanese LTCI was implemented, and claimed that there was little correlation between service quality and market competitiveness.

This paper investigated the relationship between service quality and market competitiveness many years after the implementation of the Japanese LTCI. If there is some relationship between them, the research also searched for the reasons behind the relationship.

Suzuki and Satake's (2001) Model: New Entries May Not Bring a More Qualified Service Into the Market

Suzuki and Satake's (2001) model claims that new entries in the care market do not contribute in improving the market's service quality. In general, new entries are expected to bring a more qualified service into the market, but in the case of the care market, they may spend resources on advertisement rather then service quality improvement. Suzuki and Satake (2001) point out that the advertisement cost out of the total cost of new entries is greater than that of old entries, surveying 445 at-home care providers in the Kanto area in 2000.

Nanbu (2000) presented a different view. He assumed that new entries entered the market with the break-even price (Ps), which was lower than that of existing providers (Pr). Thus, the excess profit (Pr-Ps) would possibly be

used for the improvement of service quality. In that case, however, Pr-Ps might still be spent on something other than service quality improvement (e.g., advertisement), as Suzuki and Satake (2001) argued. This competition on advertisements could also drag Pr up to balance with Ps.

However, Suzuki and Satake's (2001) model still needs to be validated. The model was investigated right after the implementation of the Japanese LTCI. The existing providers at the time were dominantly nonprofit, whereas the majority of new entries were for-profit, due to the market deregulation at the time. Also, as mentioned above, the government has made efforts to solve this problem, bridging the information gap between the users and providers. This paper on this model investigates whether new entries bring a more qualified service into the market today.

Data

The research collected detailed data on the following: 1) attributes (ownership, subsidiary business, timing of market entry); 2) capacity; 3) market environment (HHI); 4) outcome of the mandatory third-party service performance evaluation; and 5) service quality improvement[4]. The descriptive statistics of the major variables employed in this paper are outlined in Table 1.

Table 1. Descriptive statistics

	N	Min	Max	Mean	Std. Deviation
New entry dummy	1090	0.00	1.00	0.22	0.42
Subsidiary business dummy Day care	1078	0.00	1.00	0.78	0.29
Community at-home care	1078	0.00	1.00	0.02	0.14
At-home care	1078	0.00	1.00	0.01	0.12
Ownership (for-profit) dummy	1069	0.00	1.00	0.60	0.49
ln (Capacity)	1070	1.10	3.33	2.65	0.42
HHI	1076	0.01	1.00	0.22	0.25
New entry dummy 2005/2006	407	0.00	1.00	0.86	0.34
Total service quality score	1093	0.47	1.00	0.92	0.08
Total service quality score of principle component	1093	0.23	0.51	0.47	0.04
Improvement service quality score	409	-0.35	0.37	0.06	0.08
Improvement service quality score of principal component	409	-0.17	0.18	0.03	0.04

Note: The reason why the sample number of improvement scores is small is that many providers failed to disclose the evaluation outcome through WAM-NET within FY2005/2006, the initial year of the annual mandatory third-party evaluation system. The Ministry of Health, Labour, and Welfare, Japan later urged municipalities to instruct the providers to disclose the data within the fiscal year (MHLW, 2006) [42].

The data source is the WAM-NET[5] database for the Group Home providers of the fiscal year (FY) 2006/2007[6]. The sample was 1,093 Group Home providers[7] in six prefectures in the Kanto area,[8] which occupied 13 percent of all Group Home providers in Japan. Table 2 indicates the distribution of providers by ownership. Although the overall distribution of this research is similar to the national census, there are slightly more for-profits and fewer medical corporations in the investigated area. Public providers are not investigated in this research.

Table 2. Distribution of providers by ownership

Ownership		This research	National census
For-profit providers	Stock corporations, limited private companies	646 (60.43%)	4,417 (52.9%)
Nonprofit providers	Social welfare associations	196 (18.33%)	1,826 (21.9%)
	Medical corporations	144 (13.47%)	1,554 (18.6%)
	Cooperative associations	0 (0%)	31 (0.4%)
	Civil corporations	1 (0.09%)	29 (0.3%)
	Specified NPOs	81 (7.48%)	453 (5.4%)
	Other organizations	1 (0.09%)	23 (0.3%)
Public providers	Local public organizations	0 (0%)	17 (0.2%)
	Social welfare corporations (excluding social welfare associations)	0 (0%)	0 (0%)
Sum		1,069 (100%)	8,350 (100%)

Note: The national census data is as of October, 2007 and quoted from MHLW (2007). The categorizations of ownership refer to Shimizutani and Suzuki (2002: 17) [41]. There are 24 providers that miss the ownership information due to the broken link, and they are excluded from this table.

Table 3. The index of mandatory third-party evaluation

Index	Sub-index	Item
Ⅰ Corporate philosophy	1) Publicity about the corporate philosophy (4 items)	a) Publicity b) Clear indication c) Staff member's task d) Education
Ⅱ Life environment	2) Homely living space (4 items)	a) The atmosphere of entrance b) The atmosphere of common place c) The atmosphere of living room d) Customizing own room (bedroom)
	3) Customized living space (6 items)	a) Supportive devices b) Layout c) Noise proof and lighting d) Air infiltration e) Clock display f) Facilities
Ⅲ Care service	4) Care management (7 items)	a) Care planning b) Sharing care plans among staff members c) Meeting users requests d) Reviewing care plan e) Care recording f) Communication g) Team building
	5) Basic care implementation (8 items)	a) Respecting users b) Friendly attitude c) Respecting user's past experiences d) Respecting user's life style e) Hearing user's request f) Respecting user's independence g) Respecting user's physical freedom h) Unlocking door policy

Ⅲ Care service	6) ADL[17] support (10 items)	a) Hearing the meal request from users b) Eating utensils c) Customized cooking method d) Recording nutritious needs e) Enjoyable cuisine f) Customized elimination support g) Mental aspects in elimination support h) Customized bathing support i) Hair/facial treatment support j) Support for quiet sleep
	7) Life support (2 items)	a) Management of user's property b) Recreation
	8) Medical and health support (9 items)	a) Assisting medical consultation b) Collaboration with medical institutions c) Supporting user's routine health checkups d) Exercising e) Troubleshooting f) Assisting dental care g) Assisting medicine taking h) First aid i) Policy on infection disease
	9) Community life (1 item)	a) Interaction with local community
	10) Interaction with family (1 item)	a) Interaction with family
Ⅳ Managerial structure	11) Administrative procedures (10 items)	a) Locus of responsibility b) Hearing the voice of care staff members c) Sufficient number of staff members d) Staff training e) Stress control f) Application screening process g) Supporting for user's move-out h) Hygienic i) Item control j) Reporting and knowledge management
	12) Response to complaints (2 items)	a) Accepting external evaluator b) Setting complaint office
	13) Interaction between GH and family (3 items)	a) Hearing the voice of user's family b) Reporting to user's family c) Management of user's financial property
	14) Interaction between GH and community (4 items)	a) Interaction with local municipality b) Interaction with local residents c) Public relations d) Facility sharing

Note: Among the researched prefectures, Kanagawa added some local evaluation items, but they are excluded from this research.
Source: WAM-NET (www.wam-net.go.jp).

Performance Indicator of Service Quality

Quality of care service is not easy to define. There is no single absolute indicator. However, the Japanese mandatory third-party evaluation (Table 3) is the best indicator to investigate the above-mentioned three models. First, the evaluation covers the basic component of service quality. Denabedian (1987[33], 1988[34], 1992[35]) suggests that three areas of care can be scrutinized to draw conclusions about the quality of care in a facility: *structure*, *process*, and *outcome*. They correspond to "administrative procedures," "care management," and "care implementation" in the mandatory third-party evaluation, respectively. As for *outcome*, it is especially difficult to measure in the field of long-term care for elderly. Many other service quality evaluation systems simply rely on the satisfaction of users for the measurement. The Japanese evaluation, however, measures *outcome* by the assessment of trained third-party, because many users (care recipients) today cannot always express their complaints adequately (Braithewaite, 2006)[36]. The comparative studies in quality assurance for long-term care by Wiener et al. (2007)[37] point this out, saying "Japan appears to be the only country to have developed special approaches to assure the quality of care in facilities for people with dementia" (p. 8).

Second, the mandatory third-party evaluation covers the entire market regardless of provider ownership. Although there are many "qualified" indicators in the world, most of them evaluate only the care providers under the government control. These providers are usually very few because the dominant long-term care financing system in most countries is either means testing or sliding scale. In the country in which the dominant long-term care financing system is social insurance, on the other hand, all providers can basically be evaluated. According to the Organisation for Economic Co-operation and Development (2005)[38], however, only four (Japan, Germany, Austria, Luxemburg) out of 30 member countries applied for social insurance system. Moreover, even in Germany, there is no mandatory external service quality evaluation system for residential long-term care providers (Wiener et al., 2007).

This research thus utilizes the outcome of the mandatory third-party evaluation. This evaluation system was introduced in FY2005/2006[9] to the Group Home market to enhance the service quality of Group Home. The 14 indices in four categories are as follows. Ⅰ. Corporate philosophy: 1) publicity about the corporate philosophy; Ⅱ. Life environment: 2) homely living space, 3) customized living space; Ⅲ. Care service: 4) care management, 5) basic care implementation, 6) ADL support, 7) life support, 8) medical and health support, 9) community life, 10) interaction with family; Ⅳ. Management structure: 11) administrative procedures, 12) response to complaints, 13) interaction between Group Home and family, 14) interaction between Group Home and community.

Analysis

In what follows, the above-mentioned three models are investigated.

Contract Failure Model

The Contract Failure model claimed that the users in the care market do not choose a care provider based on the service quality due to the information asymmetry between users and providers. Specifically, according to Hansmann (1980), users tend to choose a nonprofit provider because they assume that nonprofit service quality is better than that of for-profit. This argument has provoked controversy among researchers. Therefore, the first part of this section investigates the assumption of nonprofits' superiority and the syndrome of contract failure. Then, the latter part of the section further discusses the cause of the disputes in previous literature by describing the implication of the examination.

Table 4. Comparison of service quality by ownership of the providers

		For-profit	Nonprofit	Simple	Controlled
1	Publicity about the corporate philosophy	0.87 (0.19)	0.88 (0.19)		
2	Homely living space	0.94 (0.14)	0.94 (0.13)		
3	Customized living space	0.95 (0.11)	0.95 (0.10)		
4	Care management	0.90 (0.16)	0.91 (0.15)		
5	Basic care implementation	0.95 (0.10)	0.96 (0.08)	N**	N*
6	ADL support	0.95 (0.08)	0.95 (0.09)		
7	Life support	0.91 (0.19)	0.92 (0.18)		
8	Medical and health support	0.92 (0.11)	0.93 (0.10)	N*	N*
9	Community life	0.95 (0.22)	0.94 (0.23)		
10	Interaction with family	0.98 (0.13)	0.99 (0.08)		
11	Administrative procedures	0.89 (0.13)	0.92 (0.11)	N**	N**
12	Response to complaints	0.95 (0.15)	0.95 (0.15)		
13	Interaction between GH and family	0.94 (0.16)	0.92 (0.17)	F**	F*
14	Interaction between GH and community	0.77 (0.26)	0.80 (0.24)	N*	
	Total score (average score of all indices)	0.92 (0.08)	0.93 (0.07)		
	Score of the principal component	0.47 (0.04)	0.47 (0.04)		
	Improvement score (average improvement score of all indices)	0.05 (0.08)	0.06 (0.08)		
	Improvement score of the principal component	0.03 (0.02)	0.03 (0.02)		

Note: The number in bracket indicates the standardized deviation.

* means 5% significant level.

** means 1% significant level.

Simple Comparison between For-profits and Nonprofits

Table 4 employs the 14 indices seen in Table 4 to present the mean scores by ownership of two types of providers (for-profit and nonprofit). This study prepared two sets of scores to measure the quality of care service. The "total score" is simply the average achievement rate of all 14 indices. The "total improvement score" is the subtraction of the "total score" in FY2005/2006 (note) from that in FY2006/2007. Thus, the numbers above 0 mean improvement and those below 0 indicate decline: the size of the number is the degree. The "principal component score" and "principal component improvement score" are estimated by principal component analysis, in which each index was evaluated with different weights. The column (simple) next to these numbers indicates the significance of the difference by means of the independent-samples t test. "F" indicates that the score of for-profits is significantly higher than that of nonprofits, while "N" refers to the reverse. The column "controlled" will be explained later in this section.

First, we look at the overall difference between for-profits and nonprofits. For-profit providers and nonprofit providers have an average achievement score of 0.92 and 0.93, respectively. The score of nonprofit providers is slightly higher than that of for-profit ones, but the difference is not statistically significant. That is also the case for the principal component score. In addition, because the improvement scores are similar, the outcome does not seem to be temporal. There is, thus, no significant difference in service quality between for-profits and nonprofits.

Table 5. The distribution by ownership of the providers

		For-profits	Nonprofits
Sample		646	423
Market environment	Herfindahl Index of the market (average)	0.2186	0.2133
Subsidiary business	Day service	63 (10%)	21 (5%)
	Community At-home care service	18 (3%)	3 (1%)
	At-home care service	14 (2%)	1 (0%)
Timing of market entry	New entry	167 (26%)	75 (18%)
Size	Capacity (average)	15.70	14.95

Table 6. The influence of other variables

Dependent variable		Total score	Score of the principal component
		Std. coefficients (p value)	Std. coefficients (p value)
Market environment	Herfindahl-Hirschman Index	-0.092 (0.003**)	-0.090 (0.004**)
Subsidiary business	Day service dummy (1=yes, 0=otherwise)	0.071 (0.038*)	0.071 (0.037*)
	Community at-home care service dummy (1=yes, 0=otherwise)	-0.016 (0.673)	-0.017 (0.653)
	At-home care service dummy (1=yes, 0=otherwise)	-0.038 (0.309)	-0.040 (0.284)
Timing of market entry	New entry dummy (1=new, 0=otherwise)	-0.093 (0.003**)	-0.093 (0.003**)
Size	ln (capacity)	-0.045 (0.139)	-0.044 (0.152)
Ownership	Ownership dummy (1=for-profit, 0=nonprofit)	-0.031 (0.319)	-0.037 (0.236)
Adj. R2		0.016	0.016

Controlled Comparison

However, this simple comparison could be misleading because providers' other variables were not controlled. This research thus investigated the providers' following variables: 1) HHI as market environment; 2) subsidiary business; 3) timing of market entry (whether or not the providers newly entered the market)[10]. Table 5 illustrates the distribution of these variables by ownership. For-profit providers appear to accommodate more users, have day service as a subsidiary business, and have more new entries.

Table 6 shows the outcomes of regression analysis with the service quality's "total score" and "principal component score" as dependent variables, respectively. The ownership dummy does not scientifically affect both "total score" and "score of the principal component" (total score: p value=0.319>0.05; score of the principal component: p value=0.236>0.5). This means, against Hansmann's (1980) argument, there is still no significant difference in the service quality between for-profits and nonprofits.

The difference in the service quality by ownership appears to be reasonable. The comparison of for-profits and nonprofits in service quality indicates the difference in market share, which represents the users' choice, as seen in Chart 1. As a result, no contract failure syndrome was found in the market.

It is, nevertheless, hard to conclude that the users in the market chose a provider based on its service quality. The variables related to the users' choice other than the ownership, of course, need to be controlled. More importantly, many of the users in FY2006/2007 might not be able to even choose a provider due to the excess of demand over supply in the market. In fact, almost all Group Home providers in the market were fully occupied through the year[11]. As seen in Table 5, more for-profits entered the market. Many users chose for-profits simply because they were the only available Group Home providers. It may, therefore, be necessary to wait until the market provides sufficient supply over demand before drawing conclusions that "contract failure" exists.

Implication: The Reason for the Disputes in Past Literature

This study examines the controversy of this Contract Failure model in previous literature looking at the feature of service quality by ownership. The last column of Table 4 shows the difference in the service quality between for-profits and nonprofits with other variables controlled by regression analysis with each index as a dependent variable.

The result is characteristic. Whereas nonprofits are superior in the indices for care service itself, including "Basic care implementation," "Medical and health support," and "Administrative procedure," for-profits excel in relations with families. The reason for this is that the family represents the voice of the users who tend to be very dependent[12]; for-profits are more sensitive to the voice of users.

These characteristic differences between for-profits and nonprofits are the cause of the disputes in previous literature: depending on the viewpoint, both ownerships could perform better. Morozumi (2007), for example, preferred the nonprofits, assessing their service quality from care recipients' viewpoint only. Suzuki (2002), on the other hand, claimed that the for-profits were possibly superior, including the aspect of information disclosure[13] to the index of service quality.

MAR Model

The MAR is the argument that market competitiveness lowers service quality. This section first presents the measurement of market competitiveness, and then compares the service quality between providers in competitive markets and those in non-competitive markets. Lastly, the section discusses the implication of the outcome.

This research measured the market competitiveness by the HHI. The HHI is probably the most used measurement of market competitiveness in economic research, but had never been applied in the study of the Japanese LTCI market until this paper. The HHI in this research was estimated as follows. First, the market share of each provider was defined as providers' capacity divided by the whole capacity in the municipality[14]. This is because the occupancy rate of Group Home was nearly 100 percent in the fiscal year (see note 11 for the detail) and the service fee in the market was uniformly regulated. Second, the HHI formula was applied.

$$H = \sum_{i=1}^{N} S_i^2$$

For example, in a market with two providers that each has a 50 percent market share, the HHI equals $0.5^2 + 0.5^2 = 0.5$.

Although the negative correlation between the service quality and the HHI has already been shown in Table 6, this section further investigates the impact categorizing the providers into two groups: the HHI 0.1 or below as the competitive market and the HHI 0.18 or above as the non-competitive market[15].

Comparison between "Competitive" and "Non-competitive"

Table 7 illustrates the distribution of the variables of each market. The competitive market has more new providers. The capacity of the providers in competitive market is greater.

Table 7. The distribution by market competitiveness of the providers

		Competitive	Non-competitive
Sample		435	426
Ownership	For-profit	256 (59%)	252 (59%)
Subsidiary business	Day service	32 (7%)	44 (10%)
	Community At-home care service	9 (2%)	12 (3%)
	At-home care service	9 (2%)	6 (1%)
Timing of market entry	New entry	119 (27%)	73 (17%)
Size	Capacity (average)	16.1	14.7

Table 8 suggests the mean scores of service quality indices by providers' market competitiveness. The "principal component score" and "principal component improvement score" are estimated by different weights based on principal component analysis. In the "simple" column, both markets are compared by the Independent-Samples t test. In the "controlled" column, on the other hand, the comparison is weighted by the variables seen in Table, by regression analysis. "C" indicates that the score of the providers in the competitive market is significantly higher than that of nonprofits, while "N" refers to the reverse.

The outcome shows that the overall service quality of "provider in the competitive market" (hereafter "competitive") is significantly better than "provider in the non-competitive market" (hereafter "non-competitive"). The total score is 0.94 for competitive and 0.91 for non-competitive. The score of competitive is higher than that of non-competitive and the difference is statistically significant. This is also the case for the "score of the principal component." The result, therefore, fails to support the hypothesis of the MAR model.

The MAR model suggested that the market competition lowers the service quality. Some critics of the MAR model argued that there also is little incentive to improve the service quality in the non-competitive market, but they were not correct. The improvement score describes the transformation of the service quality of the providers for the two years that the data are available for (FY2005/2006 and FY2006/2007). The scores of competitive and non-competitive are 0.04 and 0.07, respectively. Both numbers are positive, which indicates the improvement of the service quality. This is also the case for the improvement score of principal component.

Implication

"Competitive" (the providers in competitive market) appears to excel especially in the indices related to public relations such as "publicity about the corporate philosophy," "community life," and "interaction between GH and family." However, the strength also reaches the categories of *life environment* and *care service*. This paper is the first empirical study of MAR with the HHI and a comprehensive service quality evaluation in the long-term care market. The outcome indicates that the mandatory third-party evaluation that makes the provider's service quality information available to the public is very useful to prevent MAR syndrome, which is caused by the information gap between users and providers.

The minimized information gap also creates incentive for "non-competitive" (the providers in non-competitive market) to enhance the service quality. As seen in Table 8, the average improvement score of non-competitive is even higher than that of competitive. As a result, the mandatory third-party evaluation enhances the service quality of the market.

Table 8. The comparison of service quality by market competitiveness of the providers

		Competitive	Non-competitive	Simple	Controlled
1	Publicity about the corporate philosophy	0.91 (0.16)	0.85 (0.20)	C**	C*
2	Homely living space	0.95 (0.13)	0.93 (0.15)	C**	
3	Customized living space	0.97 (0.09)	0.95 (0.12)	C**	
4	Care management	0.93 (0.13)	0.89 (0.16)	C**	C*
5	Basic care implementation	0.97 (0.10)	0.94 (0.07)	C**	
6	ADL support	0.96 (0.07)	0.95 (0.08)	C*	
7	Life support	0.94 (0.16)	0.90 (0.20)	C**	
8	Medical and health support	0.94 (0.09)	0.91 (0.11)	C**	
9	Community life	0.96 (0.19)	0.94 (0.24)		C*
10	Interaction with family	0.99 (0.10)	0.99 (0.12)		
11	Administrative procedures	0.92 (0.11)	0.89 (0.14)	C**	
12	Response to complaints	0.96 (0.14)	0.95 (0.15)		
13	Interaction between GH and family	0.95 (0.14)	0.92 (0.18)	C**	C*
14	Interaction between GH and community	0.81 (0.24)	0.75 (0.26)	C**	
	Total score (average score of all indices)	0.94 (0.07)	0.91 (0.07)	C**	C**
	Score of the principal component	0.48 (0.19)	0.46 (0.04)	C**	C**
	Improvement score (average improvement score of all indices)	0.04 (0.08)	0.07 (0.08)	N**	
	Improvement score of the principal component	0.02 (0.01)	0.04 (0.02)	N**	

Note: The number in brackets indicates the standardized deviation.
* means 5% significant level.
** means 1% significant level.

Suzuki and Satake's (2001) Model

Suzuki and Satake's (2001) model assumed that new entries do not enhance the service quality in the care market. To investigate the validity, this research defined the providers that were first evaluated in FY2006/2007 as new entries and the providers first evaluated prior to FY2006/2007 as old ones. This section presents the comparison between them and the implication from the model.

Comparison between New and Old Entries

Table 9 illustrates the distribution of the variables of new and old entries. New entry tends to enter a more competitive market. Old entry is likely to have day care service as a subsidiary business.

Table 10 indicates the mean scores of service quality indices by the timing of market entry of the providers. The "principal component score" and "principal component improvement score" are estimated by different weights based on principal component analysis. In the "simple" column, both types of providers are compared by the Independent-Samples t test. In the "controlled" column, on the other hand, the comparison is weighted by the variables seen in Table, by regression analysis. "N" indicates that the score of the new entries is significantly higher than that of nonprofits, whereas "O" refers to the reverse.

The total score in Table 10 is 0.91 for new entries and 0.93 for old entries. The score of old entries is slightly

Table 9. The distribution by market entry of the providers

		New	Old
Sample		241	849
Subsidiary business	Day service	10 (4%)	74 (9%)
Market environment	Community at-home care service	3 (1%)	12 (1%)
	At-home care service	0 (0%)	4 (0%)
	Herfindahl-Hirschman Index	0.17	0.23
Size	Capacity (average)	15.1	15.5
Ownership (for-profit dummy)		164 (68%)	481 (57%)

Table 10. Comparison of service quality by market entry of the providers

		New	Old	Simple	Controlled
1	Publicity about the corporate philosophy	0.86 (0.19)	0.88 (0.19)		
2	Homely living space	0.93 (0.15)	0.94 (0.13)		
3	Customized living space	0.87 (0.13)	0.92 (0.10)	O*	O**
4	Care management	0.95 (0.18)	0.95 (0.15)	O*	O**
5	Basic care implementation	0.95 (0.10)	0.95 (0.09)		
6	ADL support	0.95 (0.08)	0.95 (0.08)		
7	Life support	0.92 (0.19)	0.92 (0.19)		
8	Medical and health support	0.90 (0.12)	0.93 (0.10)	O**	O**
9	Community life	0.95 (0.23)	0.95 (0.23)		
10	Interaction with family	0.99 (0.11)	0.99 (0.12)		
11	Administrative procedures	0.89 (0.13)	0.90 (0.13)		
12	Response to complaints	0.93 (0.17)	0.95 (0.14)	O*	O**
13	Interaction between GH and family	0.90 (0.19)	0.94 (0.15)		O**
14	Interaction between GH and community	0.75 (0.27)	0.79 (0.25)		O*
	Total score (average score of all indices)	0.91 (0.09)	0.93 (0.07)	O**	O**
	Score of the principal component	0.46 (0.05)	0.47 (0.04)	O**	O**
	Improvement score (average improvement score of all indices)	-	0.06 (0.03)	-	-
	Improvement score of the principal component	-	0.02 (0.01)	-	-

Note: The number in brackets indicates the standardized deviation.

* means 5% significant level.

** means 1% significant level.

higher than that of new entries and the difference is statistically significant. This is also the case for the principal component score. The outcomes thus support the hypothesis of Suzuki and Satake's (2001) model.

Suzuki and Satake (2001) also suggest that new entries spend their "excess profit" not for the improvement of the service quality, but on something else like advertising. To investigate the validity of this explanation, Table 11 presents the transformation of the service quality of the "old" providers for which data is available for both years (FY2006/2007 and FY2005/2006). Moreover, among them, this study redefines the providers that entered the

Table 11. Comparison of service quality improvement by market entry of the providers

		New	Old	Simple	Controlled
	Improvement score (average improvement score of all indices)	0.06 (0.03)	0.02 (0.02)	N**	N**
	Improvement score of the principal component	0.03 (0.02)	0.01 (0.01)	N**	N**

Note: The number in brackets indicates the standardized deviation.
* means 5% significant level.
** means 1% significant level.

market in FY2005/2006 as "new" entries and the rest as "old" entries, so that the improvement of new and old entries can be compared. As Nanbu (2000) suggested, however, Table 11 shows that new entries improved the service quality better than old ones.

The results, thus, demonstrate that new entries do not bring a competitive service quality into the market. They, however, improve the service quality, spending the possible excess profit on it.

Implications

The score of each index in Table 10 describes the features by the timing of market entry. It appears that the old entries perform better in the indices in the category[16] of *management structure* such as "response to complaints," "interaction between Group Home and family," and "interaction between Group Home and community." On the other hand, in the category of *care service*, there is, with the exception of "medical and health support," very little difference between new and old entries. This implies that the experience is more important in the management aspect of long-term care.

Conclusion

This paper investigated the validation of the three constraint models of service quality improvement in the care market, analyzing the service quality data of 1,093 Group Home providers in the long-term care market in Japan.

This paper presented three major findings. First, there was no nonprofit superiority in the service quality in the market. The preference in service quality might vary depending on the viewpoint—care recipients might prefer the care service of nonprofit, whereas the family may chose the family-interaction of for-profit. However, the overall difference in service quality between for-profit and nonprofit was not statistically significant. Second, the disclosure system of providers' service quality information bridged the care information gap between the users and the providers, which led the market competition to enhance the service quality. Third, although new market entries were inferior to old entries (existing provider) in service quality, the improvement of new entries in the following year was greater than that of old entries. The challenge of new entries was rather managerial structure of care than care service itself.

This paper investigated the constraint models of service quality improvement using the service quality data of care providers. Further research for these models may add the aspect of financial efficiency or the preference of potential users.

Note

1 Group Home is a community-based nursing home facility for the elderly with dementia.
2 They are described as "certified evaluators" in Figure 1.

3 The competitiveness intensity was measured by (referral radius) × (hospital density) × (hospital density) × (population density) (Wilson and Jadlow, 1982; p.477).
4 The service quality improvement indicates the transformation of the total service quality score of the providers that the data is available for both years (FY 2006/2007 and the previous year) calculated by the subtraction of the service quality in FY2005/2006 from that in FY2006/2007. Thus, the numbers above 0 mean improvement and those below 0 indicate decline.
5 WAM-NET is a search engine of long-term care providers run by the Social Welfare and Medicaid Agency.
6 The data of FY 2007/2008, the latest fiscal year in which this research was conducted, were not available in a uniform way as the evaluation criteria in many prefectures were modified during the fiscal year.
7 That was all Group Home providers in the market at the time.
8 Tokyo metropolitan was not included in this research because its service quality evaluation was exceptionally different from that of other prefectures.
9 There was a two-year trial period prior to the introduction: the providers that had already entered the market before 2005 had to disclose the evaluation outcome at least once within the trial period.
10 The providers that participated in the mandatory third-party evaluation for the first time in FY2006/2007 are defined as new entries.
11 According to the census of Ministry of Health, Labour and Welfare (MHLW), the average number of Group Home users (excluding short-term users) in Japan in FY2006/2007 was 11,9433.3 per month (MHLW, 2008, p.95)[43], whereas the capacity of whole Group Home providers (as of Oct. 2006) was 123,580 (MHLW, 2007). These make about 97 percent occupancy rate through the year.
12 According to the survey by MHLW (2007), 73 percent of Group Home users are not capable of ADL care level (*youkaigo*) 2 or above.
13 This includes issuing newsletter for the members (user's family).
14 Because Group Home is categorized as a community care service (MHLW, 2006), it can be assumed that the market of Group Home providers indicates the municipality.
15 According to Parkin and Bade (2006)[44], HHI 0.18 or above indicates concentration (i.e., low competition), whereas HHI 0.1 or below means un-concentration (i.e., high competition).
16 There are four categories for the indices as seen in Table 3.
17 Activity for Daily Life.

Reference

1) Suzuki, W., Satake, N. Nihon no kaigo service jigyo no jittai (Analyzing Japanese care service industry). Economics (Toyo Keizai Shinpo sha) 2001; 6: 180–195.
2) Hansmann, H. The role of nonprofit enterprise. Yale Law Journal 1980; 89 (5): 835–901.
3) Hirth, R. Consumer information and competition between nonprofit and for-profit nursing homes. Journal of Health Economics 1999; 18: 219–240.
4) Endo, H. Iryo fukushi niokeru eirisei to hieirisei (For-profits and nonprofits in care industry), Iryo to shakai 1995; 5 (1) : 27–41.
5) Suzuki, W. Hieirihoumon kaigosha wa yuri ka? (Do nonprofit care providers have advantages?), Shakaihosho kenkyu 2002; 38 (1): 74–88.
6) James, E., Rose-Ackerman, S. The Nonprofit Enterprise in Market Economics: Harwood Academic Publishers, 1986.
7) Tuckman, H. P., and Chang, C. F. Cost convergence between for-profit and not-for-profit nursing homes: does competition matter? Quarterly Review of Economics and Business 1988; 28 (4): 50–65.
8) Nanbu, T. Kaigo service sangyo he no kotekikaigohoken donyu no keizaiteki kiketsu (Economic consequences of introduction of public long-term care insurance system into long-term care industry in Japan) National Institute of Population and Social Security Research (IPSS) Iryo kaigo no sangyo bunseki (Analysis of health care and long-term care industry), Tokyo University Press, Tokyo, 2000.
9) Ben-Ner, A. The shifting boundaries of the mixed economy and the future of the nonprofit sector. Annals of Public and Cooperative Economics 2002; 1: 5–40.
10) Weisbrod, B. A Heteroscedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroscedasticity. Econometrica 1988; 48.

11) Cohen, J., and Spector, W. The effect of Medicaid reimbursement on quality of care in nursing homes. Journal of Health Economics 1996; 15: 23–48.
12) Gertler, P. Structural and behavioral differences in the performance of proprietary and not for profit organization. Mimeo, 1984.
13) Nyman, J. A. Excess demand, the percentage of Medicaid patients, and the quality of nursing home care. Journal of Human Resources1988; 23 (1): 76–92.
14) O'Brien, J., Saxberg, B. O., and Smith, H. L. For-profit or not-for-profit nursing homes: does it matter? Gerontologist 1983; 23: 341–348.
15) Endo, H. Iyo to hieirisei, hoken, iryoteikyo seido (Medicare and nonprofit, healthcare, healthcare system) Funso shobo publishing, 2006. 47–79.
16) Morozumi, R. Quality of Care in Japanese Group Homes for the Elderly with Dementia: Synergy of Facility Services and Medical Services. Working Paper 2007; http://www3.u-toyama.ac.jp/review/fudai/WP/216_Morozumi.pdf. Aug. 10, 2008.
17) Sakurai, M. Hieiri/Eiri soshikino service no shitsu nikannsuru hikakukennto (The comparison between for-profit and nonprofit in care service quality), Journal of Research on NPOBP 2008; 10: 51–60.
18) Hersch, P. L. Competition and the performance of hospital markets. Review of Industrial Organization 1984; 1 (4): 324-340.
19) Luft et al. The role of specialized clinical services in competition among hospitals. Inquiry 1986; 23: 83-94.
20) Robinson, J. C. Market structure, employment, and skill mix in the hospital industry. Southern Economic Journal 1988; 55 (2): 315-325.
21) Wilson, J. C., and Jadlow, J. M. Competition, profit incentives, and technical efficiency in the provision of nuclear medicine services. The Bell Journal of Economics 1982; 13.
22) Farley, D. E. Competition among hospitals: market structure and its relation to utilization, costs, and financial position. Hospital studies program, National Center for Health Service Research and Health Care Technology Assessment, Research note 7, 1985.
23) Robinson, J. C., and Luft, H. The impact of hospital market structure on patient volume, average length of stay, and cost of care. Journal of Economics 1985; 3: 1–24.
24) Zwanziger, J., and Melnick, G.. The effects of hospital competition and the Medicare PPS program on hospital cost behaviour in California. Journal of Health Economics 1988; 7: 301–320.
25) Devers, K. J., Brewster, L. R., and Casalino, L. P. Changes in hospital competitive strategy: a new medical arms race? Health Service Research 2003; 38 (12): 447–469.
26) Berenson, R. A., Bodenheimer, T., and Pham, H. H. Specialty-service lines: salvos in the new medical arms race. Health Affairs 2006; 25 (5): 337–343.
27) Drabivem D., Shanley, M., and Simon, C. Is hospital competition wasteful? Rand Journal of Economics 1992; 23 (2): 247-262.
28) Shortell, S. M., and Hughes, E. F. The effect of regulation, competition, and ownership on mortality rates among hospital inpatients. The New England Journal of Medicine 1988; 318: 1100-1107.
29) Kessler, D. P., and McClellan, M. B. Is hospital competition socially wasteful? NBER 1999; working paper, 7266.
30) Gertler, P. J., and Waldman, D. M. Quality-adjusted cost function and policy evaluation in the nursing home industry. Journal of Political Economy 1992; 100 (6): 1232–1256.
31) Nyman, J. A. The effects of market concentration and excess demand on the price for nursing home care. Journal of Industrial Economics 1994; 42 (2): 193–204.
32) Zhou, Y., Suzuki, W. Nihon no houmonkaigoshijo niokeru shijosyucyudo to kouritusei (The correlation among the market centralization, efficiency and service quality in Japanese care market) Japan Economic Research 2004; 49 (3): 173–187.
33) Donabedian, A. Commentary on some studies on the quality of care. Health Care Financing Review 1987; Spec No: 75-85.
34) Donabedian, A. The quality of care. How can it be assessed? JAMA 1988; 260: 1743-1748.
35) Donabedian, A. The role of outcomes in quality assessment and assurance. QRB 1992; 18: 356-360.
36) Braitwaite, J. Regulating nursing homes: The challenge of regulating care for older people in Australia 2006; BMJ 2001 (323): 443–446.
37) Wiener, J. M. Quality Assurance for Long-Term Care: The Experiences of England, Australia, Germany and Japan. AARP, 2007;

<http://www.aarp.org/research/longtermcare/quality/2007_05_ltc.html>, Dec 10, 2008.

38) OECD. The OECD Health Report: Long-term Care for Older People. OECD Publishing, 2005.

39) MHLW. Heisei 18 nendo Kaigo saabisu shisetsu/jigyousho chousa kekka no gaiyou (The research on long-term care proviers 2007) 2007;
< http://www.mhlw.go.jp/toukei/saikin/hw/kaigo/service06/kekka1.html >, Aug, 12, 2008.

40) Health and Welfare Statistic Association, Japan. Toukei de wakaru kaigohoken (Statistics of Long-term Care Incurance) . Health and Welfare Statistics Association, 2007.

41) Shimizutani, S and Suzuki, W. The quality of efficiency of at-home long-term care in Japan: evidence from micro-level data. ESRI Discussion Paper Series 2002; 18.

42) MHLW. Chiiki micchakugata saabisu niokeru jikohyouka oyobi gaibuhyoukano jisshinitsuite (Request on the self-evaluation and third-party evaluation for community-based care services) 2006;
< http://www.mhlw.go.jp/shingi/2006/10/dl/s1005-7b01.pdf >, Dec 29, 2008.

43) MHLW. Heisei 18 nendo Kaigokyuufu jittaityousahoukoku (Report on the payment of Long-term care insurance's benefit 2007), Health and Welfare Statistic Association, 2008.

44) Parkin, M., and Bade, R. Solution to Odd-Numbered Problems, Chapter 9 Organization Production, Economics: Canada in the Global Environment, Sixth Edition: Pearson Education Canada, 2006; <http://www.pearsoned.ca/highered/divisions/bande/parkin/solutions/soluch09.pdf>, Dec. 31, 2008.

Author Contact

Yoshihiko Kadoya
PhD candidate, Graduate School of Government, The University of Sydney
Unit 2, 307 Glebe Point Road, Glebe, NSW 2037 Australia
Tel:+66-432-609-057
E-mail:yoshi.kadoya@gmail.com

Invited Counter Argument for "Managing the Long-term Care Market: The Constraints of Service Quality Improvement"

Takuma Sugahara Ph.D.
National Institute of Public Health

This paper investigates the validity of three topics related to service quality improvement in the long-term care market in Japan, especially focusing on service in Groupe homes. Three constraint models that explain the failure to improve service quality in the long-term care market: the Contract Failure Model, the Medical Arms Race (MAR) Model, and Suzuki and Satake's (2001) Model are empirically addressed. In conclusion, none of the three models was fully supported. This sound conclusion is suggestive in considering the role of market mechanisms in the long-term care market, but some further factors or topics should have been noted for consistency with the real conditions of the Group home market in Japan.

1) The fundamental framework of this study is to assume that service prices are fixed under the long-term care insurance system, and the efficiency of market mechanisms is measured by the quality of care. It is true that reimbursement for these services is publicly regulated. However, in Group homes, each provider is free to set not only the price of hotel costs, including rent, food expenses, and electricity and heating expenses, but also tentative guarantee money, diaper expenses, recreation costs and so on. These differences in charges surely reflect the quality of service. In this study, these price differences are not explicitly considered and should have been noted.

2) It is generally observed there exists an excessive demand for facility services, which are at capacity in the Japanese long-term care insurance system. This waiting-list phenomenon is also observed in most Group homes. The effects of market competition on the supply side might be seen differently depending on the conditions of the demand side. At least, it is likely to be different due to whether the capacity of long-term care facilities or Group homes is sufficient to meet regional demand. Assuming conditions of a supply-side oligopoly, each supplier may have less of an incentive to improve their service quality compared to more competitive conditions. Though the author does not refer to this point, relativity between the capacity for supply and regional demand could be a crucial point in validating the effects of new entrants to the market.

3) The problem of market segmentation always comes up when we try to evaluate the effects of market mechanisms. This research measured the market competitiveness by the HHI, and the HHI is only calculated in consideration of the Group home share. It is well known in Japan that Group homes are specialized in caring for people with dementia. In reality, many patients of dementia also live in assisted nursing homes for elderly (*Kaigo-Ryouyougata-Roujin-Fukushi-Shisetsu*) or intermediate nursing homes (*Kaigo-Roujin-Hoken-Shisetsu*). These long-term care service facilities can also be regarded as competitors of Groupe homes within a region. So it may be natural and more consistent to include information on such facilities in the data set to verify the effects of market competitiveness.

Japanese Journal of Health Economics and Policy: Guidelines for Authors

The Japanese Journal of Health Economics and Policy accepts articles from the subject areas of health economics and health care policy. Articles that are submitted to the Editorial Committee of the journal have to be original and, as such, should not have been published elsewhere, either in whole or in part, and should not be submitted to other journals while a decision on publication by the Editorial Committee is pending. Contributing authors should be mindful of, and strictly follow, the Guidelines set below.

1. The purposes of the journal are as follows:
   1) The development of research in the area of health economics and health care policy, with a view to this forming an academic basis for policy design and its evaluation.
   2) The provision of opportunities for scholars and other interested parties to present research results in the area of health economics and policy.
   3) The promotion of free exchange and the discussion of views, ideas, and opinions among all persons concerned with the various dimensions of health economics and health care policy.
2. Primarily, the following types of articles are accepted for publication:
   1) Research Papers: These are articles presenting detailed, original, empirical and/or theoretical research, and providing a clear statement and explanation of the objectives, method, and result of the research in question.
   2) Research Notes: These comprise small and concise notes on the original research, or articles containing new views and opinions of academic value that do not meet the standards of a research paper.
   3) Research Reports: These include reports on particular data, surveys, experiments, and other such matters, along with reports on improvements in research methodologies that can provide useful information for future research activities.
   4) Other articles that are approved by the Editorial Committee may be published.
3. Authors are subject to no restrictions with regard to their areas of research interest and expertise. The authors are not required to be members of the Institute for Health Economics and Policy and/or the Japan Health Economics Association.
4. Authors should email the main text of their articles along with the figures/tables and the abstract, and should, in addition, send a hard copy of the articles through regular mail. Articles once submitted will not be returned. Authors may express a preference as to whether their articles are to be published as a research paper, as research notes, or a research report, although author preferences regarding article type will not be binding upon the Editorial Committee.
5. Authors should follow the Writing Guidelines attached with the Authors' Guidelines. When asked by the Editorial Committee to make revisions, authors are expected to revise their articles in full accordance with the requirements of the Committee and to resubmit their completed and revised articles. If a resubmission is not made within 90 days from the date of notification, the submission will be considered as withdrawn. However, the 90-day limit will not apply in cases where the Editorial Committee decides that there is a valid reason for the delay.
6. In the case of articles based on research that has been supported by grants, fellowships, or other such funding, authors are required to provide the names of the awarding institutions or organizations concerned, the research title, the year the grant/fellowship was received, and all other relevant information in their acknowledgements.
7. The authors must clearly indicate that all research involving human subjects was conducted in accordance with the standards set out in the Ethical Guidelines for Epidemiological Studies and Ethical Guidelines for Clinical Research.
8. In the case of research concerning the assessment of health care technology, authors are advised that the Editorial Committee may, if necessary, request information regarding possible conflicts of interest prior to the evaluation of the articles concerned.
9. Decisions regarding the acceptance of articles for publication and the designation of the type of article will be made by the Editorial Committee on the basis of the referees' reports. Submissions that do not meet the standards for research papers may be published as research notes or research reports.
10. Authors are advised that the Institute for Health Economics and Policy will retain the copyrights for all the works accepted for publication. The authors of the papers accepted for publication will be requested to sign a consent form for copyrights transfer.
11. There is no publication fee for the published papers. Extra copies of published papers will be provided at actual cost price upon the authors' request.
12. Articles accepted and published as research papers will be eligible for consideration by the Institute for Health Economics for its "Most Valuable Papers of the Year Award."
13. Authors should assume principal responsibility for proofreading of the paper for language (English) related issues. Therefore, when the level of English does not meet the standard, authors may be requested to bear reasonable expenses for additional proofreading done by the Editorial Committee.
14. Articles should be sent to the following address:
    Editorial Office of the Japanese Journal of Health Economics and Policy:
    Institute for Health Economics and Policy
    No. 11 Toyo Kaiji Building 2F, 1-5-11 Nishi-shinbashi, Minato-ku
    Tokyo 105-0003 Japan
    Telephone: (+81) 3-3506-8529; Fax: (+81) 3-3506-8528
    E-mail: kikanshi@ihep.jp

Effective on and from April 27, 2009.

"Japanese Journal of Health Economics and Policy" Writing Guidelines

1. Format of articles
Articles are to be submitted in the format of an A4-size Microsoft Word document file with 36 lines per page. As referee reading will be conducted anonymously, the following four items should be included on the cover page (first page), while the main text should appear from the body page (second page) onward and acknowledgements should not be included from that page onward. (1) The title of articles, the name, title and institutional affiliation of authors, acknowledgements, and the date of submission must be entered clearly on the cover page. (2) The name, title, institutional affiliation, address, telephone number, fax number and email address of authors should also be provided separately for contact purposes. (3) In the case of co-authored articles, the email address of all the authors concerned must be supplied in full. (4) Where articles are based on research that has been supported by grants, fellowships or other such funding, authors are to give the name of the awarding institutions or organizations concerned, the year of the award and all other relevant information in their acknowledgements.

2. Articles in Japanese should be no longer than 12 pages, with 40 characters per line. Articles in English should be no longer than 6,000 words, excluding the cover-page, figures/tables and abstract.

3. An abstract of about 1,000 characters in Japanese or about 400 words (double-spaced) in English should be prepared and attached to the article.
Up to 10 Japanese and 10 English keywords are to be selected for article searches and listed at the end of the abstract. Keywords in English should as a rule be in lower case letters.

4. Endnotes (e.g.,'Note 1') should be placed together at the end of the main text of the article in numerical order.

5. Bibliographical references should be numbered by superscript next to the citations in the main text of articles, and the full references should be listed at the end of the main text in numerical order with all numbers clearly indicated. Up to three authors for individual works may be listed in bibliographical references, but for works with four or more authors the name of the first author only should be given and followed by 'et al.'.
The following specimen examples are to be taken as standard for contributing authors:

Journal articles:

1) Wazana, A. Physicians and the pharmaceutical industry: is a gift ever just a gift? Journal of American Medical Association 2000; 283: 373-380.

Books:

1) Organization for Economic Co-operation and Development. A System of Health Accounts. Paris: OECD Publications, 2000.

Translations:

1) Fuchs, V., 1991. National health insurance revisited. Health Affairs [Winter], 7-17. (Translated by Emi, Niki, Kenjo. Future of Healthcare Policy. Keiso Shobo, 1995. 245-261).

6. Figures and tables are to be numbered sequentially, with captions added and sources clearly indicated. Figures should not be entered into the main text of articles, but should rather be placed individually in separate attachments with the places for insertion indicated in the right margin of the main text.

7. Roman and Arabic numerals and letters used for outlines should as a rule
be set out in the order as follows: 1. (1) a) ....

February 10, 2010

To the Members:

Yasuki Kobayashi
President for,
5th Annual Conference of the Japan Health Economics Association

Notice of the "5th Annual Conference of the Japan Health Economics Association"

Dear Members:

We proudly announce that the Japan Health Economics Association will hold its 5th annual conference for 2010 according to the following schedule. We are looking forward to seeing you in Hongo Campus, Tokyo, and exchanging scientific discussion on health economics, policy, and other relevant topics...

Sincerely

Ⅰ. Date, Place, and Registration

Date: 10:00 - 18:00 (provisional) on Saturday, July 10, 2010
Place: Tetsumon Memorial Hall, the Education and Research Building, Graduate School of Medicine, the University of Tokyo (3-1, Hongo 7-chome, Bunkyo-ku, Tokyo)
Registration fee: ¥5,000 for members; ¥1,000 for student members; ¥10,000 for non-members

Ⅱ. General meeting of the association members

The general meeting will be held during the annual conference.

Ⅲ. Guideline for paper submission

- Scientific papers on health economics, health services research, and other relevant topics are cordially invited for presentation. Final decision on paper acceptance will be left to the Program Committee.
- **Qualifications for applicants**
  The first author / presenter of the paper must be a member of the Japan Health Economics Association. Otherwise, there are no qualification rules for co-authors. Member registration for the Japan Health Economics Association is recommended to non-member participants. If the first author/presenter is a graduate school student, a recommendation letter from his/her supervisor should be accompanied.
- **Schedule**
  The structured abstract (format attached below) should be submitted by: Friday, February 26, 2010.
  The decision on paper acceptance by the Program Committee will be finalized and announced in early April, 2010.
  Those whose paper is accepted should submit the final version of the paper by: Friday, May 21, 2010. Submitted papers will be forwarded to appointed peer reviewers for counter comments. The deadline should be strictly met. A submitted paper should be scientifically sound and organized. The presenter is also asked to submit a PowerPoint version of the paper for oral presentation by: Friday, June 25, 2010.

● **Abstract submission**

The structured abstract should be submitted by e-mail to the JHEA secretariats. Standardized format is available at the JHEA webisite (see Contact Address).

Japanese as well as English abstract is acceptable.

- ○ Japanese abstract should be prepared in one-page A4-size sheet by Word, 40 characters per line x 36 lines, 1,440 two-byte characters in total without figure. One figure/table should be counted as 240 two-byte characters.
- ○ English abstract should be prepared in one-page A4 sheet by Word, 500 words maximum. One figure/table should be counted as 100 words.
- ○ Maximum number of characters/words includes author's name, affiliation, and paper title.

● **Appointed peer reviewer and counter comment**

At the time of abstract submission, the author is asked to appoint two potential peer reviewers who are acquainted with the topic/theme of the paper, and are available for counter discussion to the submitted paper. Final decision of reviewer assignment will be left to the Program Committee. It is preferable that appointed peer reviewers are selected among the members of the JHEA.

● **Paper submission and presentation**

A submitted paper for peer review should be written in either Japanese or English. Oral presentation and counter discussion require a PowerPoint version of the paper. Oral presentation can be done in either Japanese or English.

- ▶ The first authorship is limited to only one paper/presentation. Co-authorship is allowed for more than two papers/presentations.
- ▶ The presented paper should be an unpublished article. .

●List of the members of the Program Committee

President for the annual conference	Professor, Graduate School of Medicine, the University of Tokyo	Yasuki Kobayashi
Committee Chair	Professor, School of Public Health, the University of Tokyo	Hideki Hashimoto
Member	Senior Researcher National Institute of Population and Social Security Research	Nobuyuki Izumida
Member	Associate Professor, Department of Health Care Administration and Management, Graduate School of Medical Sciences, Kyushu University	Kazuaki Kuwabara
Member	Manager Department of Management Science, National Institute of Public Health	Takuma Sugahara
Member	Senior Researcher, Department of Theoretical Social Security Research National Institute of Population and Social Security Research	Haruko Noguchi
Member	Associate Professor, School of Public Health, the University of Tokyo	Takahiro Higashi
Member	Special Principal Researcher, Institute for Health Economics and Policy; Associate Professor, School of Public Health, the University of Tokyo	Takashi Fukuda

Contact address

Secretariat of the Japan Health Economics Association
c/o Institute for Health Economics and Policy, Association for Health Economic Research and Social Insurance and Welfare (2nd Fl., No.11 Toyo-kaiji Bldg., 5-11, Nishishimbashi 1-chome, Minato-ku, Tokyo, 105-0003)
Tel: 03-3506-8529 Fax: 03-3506-8528 E-mail: gakkai@ihep.jp http://www.ihep.jp/

5th Annual Conference of the Japan Health Economics Association Structured Abstract Format

Author	
Affiliation	
Title	
Background Objective Method Results Discussion	

Japanese Journal of Health Economics and Policy *Vol.21 E1 2010*

平成 22 年 2 月 10 日発行

編集・発行 **医療経済学会**
医療経済研究機構
〒 105 － 0003 東京都港区西新橋 1 － 5 － 11
第 11 東洋海事ビル 2F
財団法人 医療経済研究・社会保険福祉協会内
TEL 03（3506）8529
FAX 03（3506）8528
医療経済研究機構ホームページ：http://www.ihep.jp
医療経済学会ホームページ：http://www.ihep.jp/jhea/index.html

制作 株式会社 **法研**
〒 104 － 8104 東京都中央区銀座 1 － 10 － 1
TEL 03（3562）3611

印刷・製本 研友社印刷株式会社

会員サービス向上の一環としまして、バックナンバーについては医療経済学会ホームページより、PDF による Web 上での閲覧可能です。本年号については、パスワード入力により会員様画面で閲覧が可能です。会員の皆様にはこれまでどおり最新号をご郵送いたします。
なお、非会員の方々は 1 年以上経過したバックナンバーが Web 上で閲覧可能です。