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

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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%).

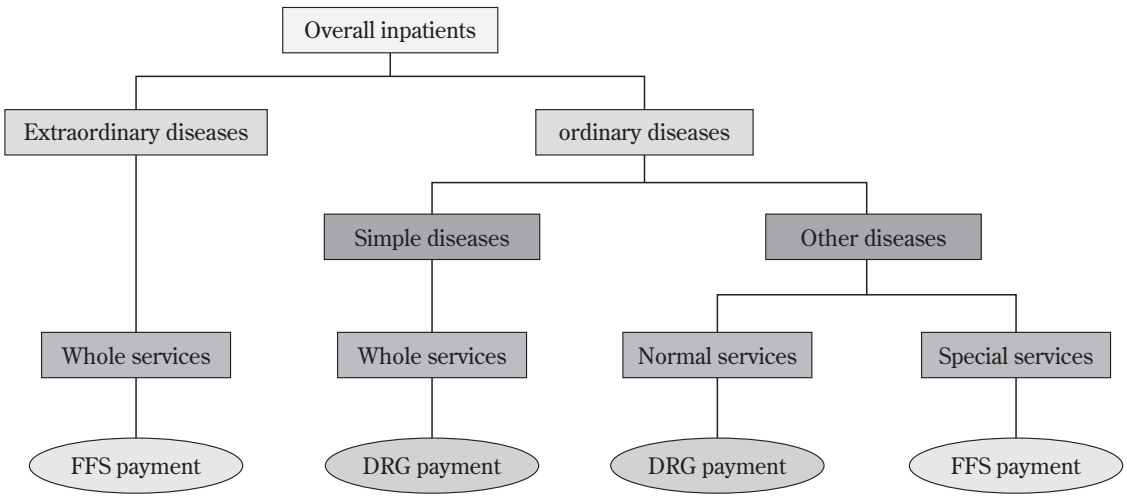
The annual rate of increase in per capita pharmaceutical cost in real terms for 1995-2005 period was 5.4% in Korea, ninth among OECD countries; this was only 0.8% in Japan, and the OECD average was 4.6%. The number of MRI tests performed per million people as of 2005 was 12.1 in Korea; Japan, with 40.1 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

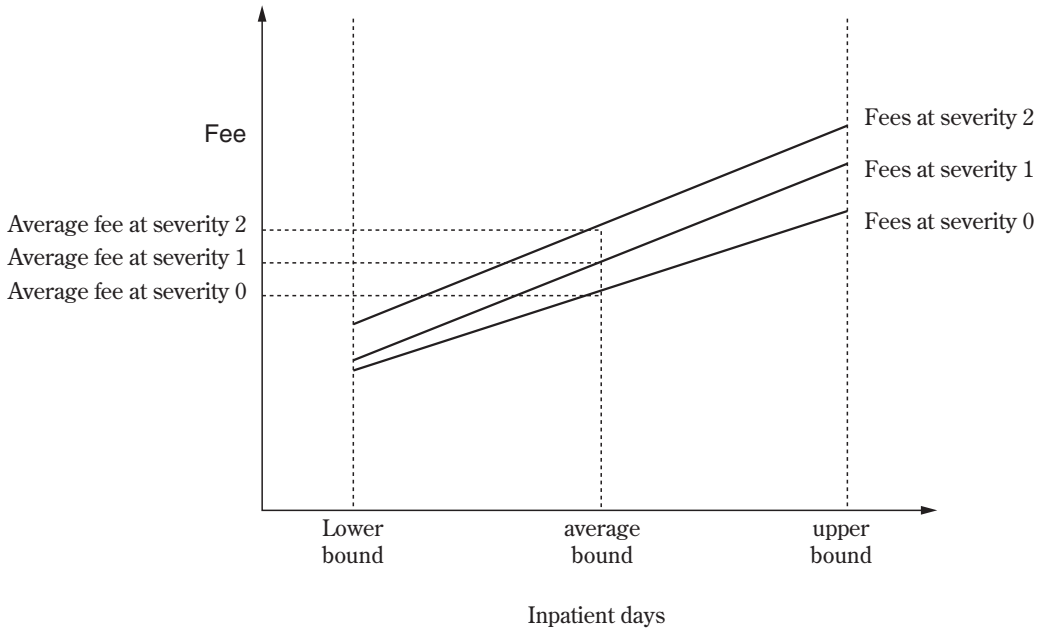


Figure 2. HIRA's Proposal for DRG Fee Schedule

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.

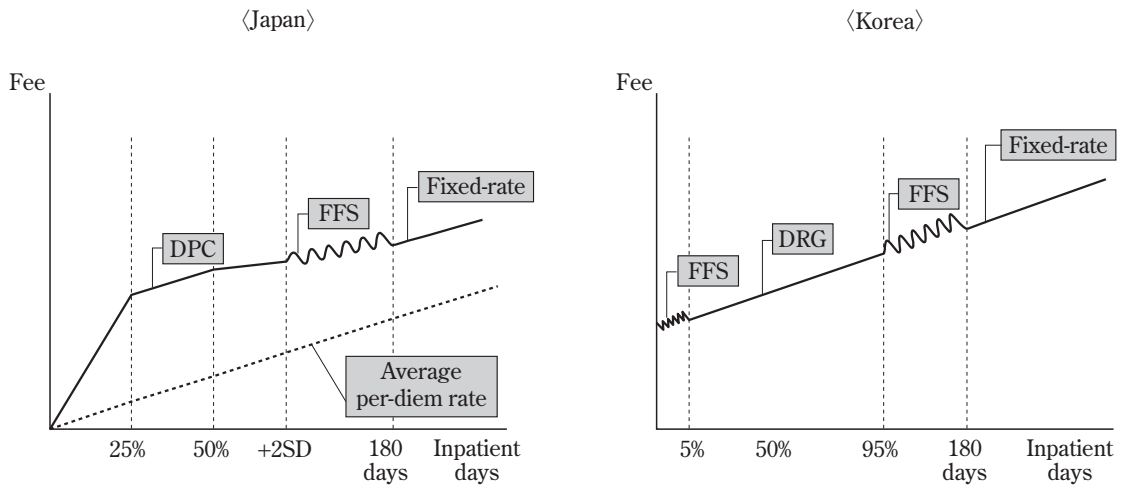


Figure 3. Fee Schedule of Japanese DPC and Korean DRG-based payment systems

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

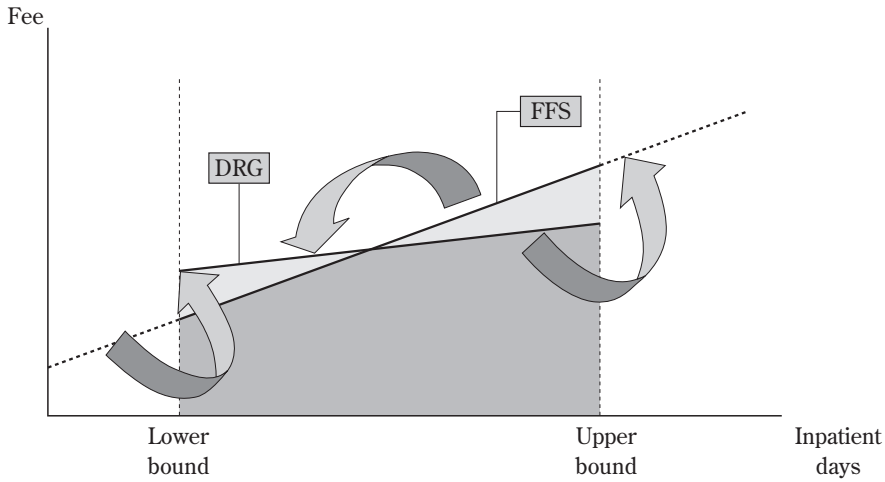


Figure 4. Provider's Strategies for Obtaining More Reimbursement

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.

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