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A Study on the Calculation of Conversion Factor for 2010

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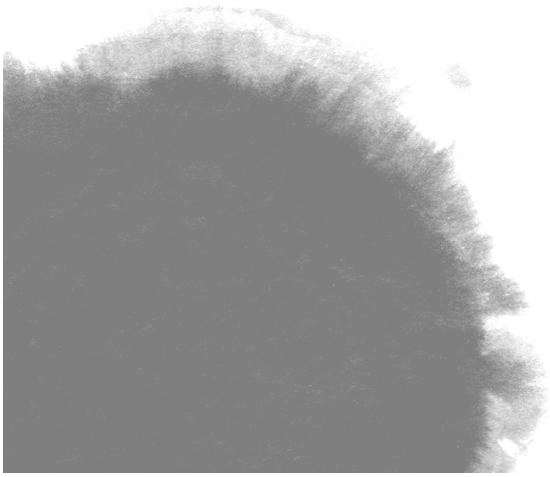
Introduction



CHAPTER 1
Introduction

□ In 2001, when the medical fee contract system was adopted, the conversion factor determined was 55.4 Won based on the results of the first study on relative values conducted in 1997 by the Institute of Health Services Research at Yonsei University College of Medicine and the National Evidence-based Healthcare Collaborating Agency (NECA).

- The conversion factor for 2002 was determined by a government committee, based on the calculation using cost and business analysis by the Management Research Center at Seoul National University College of Business Administration. In 2003, the conversion factor was deliberated and determined by a government committee, also based upon the results of cost and business analysis by a consortium of the Management Research Center at Seoul National University College of Business Administration, Yonsei University, Korea Health Industry Development Institute (KHIDI) and the Korea Institute for Health and Social Affairs (KIHASA).
- It has been a practice to estimate the medical fee level based on cost or financial performance analysis of medical institutions from these studies.

□ Since 2004, the need arose to develop a cost-effective model for calculating the conversion factor with macro indices, rather than ineffective cost or financial performance analysis.
  - With this purpose, a study was conducted to calculate the conversion factor using the Sustainable Growth Rate (SGR) model applied by the US Medicare, a method utilizing target medical expenditure (Byongho Tchoe and others, 2003).
  - However, the National Health Insurance Corporation (NHIC) and the providers could not agree on the outcome because of conflict of interest.

□ Thus, NHIC and the providers separately continued studies on the conversion factor from 2004. A joint study, undertaken once in 2005, failed to conclude the medical fee contract from biased selection of researchers and doubtful research process.

□ In 2006, a contract was agreed under the condition that the subscriber groups accepted to enter into separate contracts for each institution type with an increase rate of over 3% from the following year.

□ The conversion factor by institution type failed to be agreed upon in 2007 but was successfully entered into in 2008, continuing through 2009 and 2010.

□ Many studies have been conducted to determine the conversion factor since the adoption of the medical fee contract system in 2001, but the concerned parties failed to agree every year with the only exception of 2006.
  - The disagreements resulted from different opinions of the concerned parties (consumers, providers)

regarding data reliability, objectivity of the study method, and reasonable fee level.

□ The necessity has been constantly raised to identify objective study methods and reliable data that subscribers, providers and insurers can agree upon with regard to the conversion factor contract.

- Many studies on the conversion factor have been carried out using various methods as the SGR model, financial performance analysis, cost analysis, revenue/cost method, health insurance financial neutrality and the improvement of the medical service level. However, most studies failed to reach an equal agreement, being either favorable or unfavorable to concerned parties depending on the method used.

□ Therefore, it is necessary to identify a study method and reliable base data that can be agreed upon by the insurers, subscribers and providers through comparative analysis of pros and cons of each existing method.

□ It is also necessary to develop a standard model to be utilized in the long run.

- A standard model, upon which, concerned parties can agree on is necessary since it is too time consuming to find new study methods and data every year.

□ Thus, the purpose of this study is to analyze the pros and cons of the conversion factor methods applied by existing studies and identify a reasonable calculation model.

- This study has been conducted to identify a conversion factor model that corresponds to the

sound development of the health insurance, by reviewing the advantages and disadvantages of the existing methods to the concerned parties and considering the health insurance finances.

□ Another goal is to identify a method for collecting reliable and objective data.

- Objective, feasible, reasonable and reliable data should be collected and applied.

□ The ultimate purpose is to calculate the conversion factor of each institution type to be used for 2010.

- A practical conversion factor should be calculated to be utilized as a touchstone for the 2010 conversion factor contract by institution type, starting September 2009.
- At the same time, a new classification should be suggested if the present classification of medical institutions is found inappropriate.

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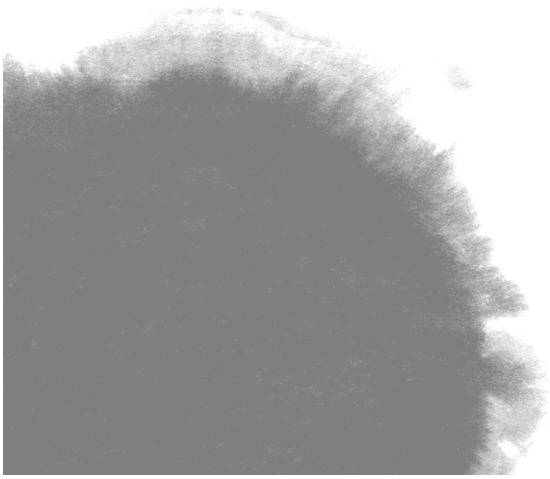
02

Conversion Factor Calculation Models and Assessments



CHAPTER 2

Conversion Factor Calculation Models and Assessments

1. Index model[1)]

A. Description

□ The index model calculates the conversion factor of a desired year by assuming the conversion factor of a specific year as true and measuring the changes in the factor from changes in the Medical Economic Index (MEI) and medical fee revenues.

- This method was first suggested by an NHIC study on conversion factor calculation for 2005. It has been developed to overcome the issues with objectivity, feasibility and reliability of the outcome, arising from the fatal flaw of the existing cost analysis method (Jinhyun Kim and others, 2004; Jinhyun Kim, 2009).

□ The conversion factor is calculated by indexing the change rate of revenues and costs of the past year, based on the premise that the financial performances of the medical institution in the base year was balanced at the

1) The index model has been reconstructed based on the methodology presented in the study on the conversion factor by institution type by Jinhyun Kim and others.

conversion factor level set by the government.

- The index model considers the fact that the medical fee contract period is one year, and there are disagreements between providers and subscribers on whether the financial performance of the medical institution is actually a surplus or a deficit. Thus, the model assumes that the base year is balanced and calculates the conversion factor for the time frame of one year until the next medical fee contract is entered, based on the financial changes of that year.

B. Calculation Formula

○ If the conversion factor for an identified year is F′,

$F' = F \times (1+\delta)$

(F = current conversion factor)

○ Since the relationships of $R1' = R1 \times (1+s)$ and $C1' = C1 \times (1+p)$ are valid and initial condition C1=R1 is established from financial balance when the conversion factor of the base year is applied, the medical fee increase rate can be expressed as a growth rate function as follows:

$$\delta = \frac{C_1' - R_1'}{R_1' a}$$

$$= \frac{C_1(1+p) - R_1(1+s)}{R_1(1+s)a}$$

$$= \frac{(1+p) - (1+s)}{(1+s)\ a} \quad (\because C_1 = R_1 \text{ initial condition})$$

$$= \frac{p-s}{(1+s)\ a}$$

○ $F' = F \times (1+\delta)$

$= \mathbf{F} \times \left[1 + \frac{p - s}{(1+s)\ a}\right]$

C. Assessment of the Index Model

□ Positive aspects of the index model are as follows:

- The advantage is that, the conversion factor can be simply calculated by applying major parameters as the health insurance covered revenue rate, ratio of practice fees in the revenues from health insurance coverage.
- Objectivity is guaranteed since the data used is the government's official statistics data (extracted from complete enumeration survey), not sample data.
- Unlike sample surveys, there is no issue of reliability or deviation.
- The logic of the cost analysis method is applied using more reliable data.
- The method can reflect the trend in health insurance-covered expenditures.
- It is possible to avoid disputes on the level of past conversion factors.

□ The following have been pointed out as the negative aspects:

- Verification is necessary on whether existing public announcement data comply with the principle of matching costs and revenues of health insurance covered medical practices.
- The index model calculates the conversion factor

from the difference of the increase in the revenues and costs. This is structurally unfavorable for providers because the increase in revenues is higher than in costs, leading to arguments that the resulting conversion factor should be lowered.

- The medical fee, which impact revenues, increase from various factors that may sometimes be from natural causes and the index model cannot reflect these characteristics.
- In case there is an increase from larger coverage, the revenue of medical institutions will be the same since NHIC is covering consumers' out-of-pocket payments. This is unfavorable because the revenue growth will be evaluated as resulting from expansion of insurance coverage.

– While the calculation only includes the increase rate of insurance benefit performance, the revenue growth rate may change depending on the differences in uncovered ratio each year.

– The index model also has a limit of reflecting only the previous year's increase, not the historical trend.

– It is also pointed out that the assumption of the initial condition $C_1=R_1$, that the financial performance is balanced at the conversion factor level of the base year(t) has neither been proven nor is realistic.

2. SGR Model

□ The SGR Model is a modified version of the US SGR system of calculating the relative value conversion factor.

The model has been modified reflecting Korea's circumstances.

□ The overview of the SGR system mechanism is as follows:

- The first step is to set the target medical fee (practice fee) and adjust the conversion factor (fee level) to bring the actual fee near the target.
- The target is then calculated by multiplying the SGR to the previous year's target.
  - Target = Previous year's target × SGR
- SGR is estimated by considering the MEI, real income growth, population growth, index reflecting the changes in the population structure as ageing and any expansion in the insurance coverage.
- SGR = Changes in the practice fee × Real income growth rate per capita × Population growth rate × Index compensating the population structure × Changes from laws and regulations
  - MEI is the weighted average calculated by price increase/decrease rate per cost item multiplied by the proportion per cost item of medical institutions.
  - Index compensating the population structure refers to indices that reflect medical expense increase from population-related natural causes such as ageing.

□ Through this process, the conversion factor is automatically adjusted to bring the actual medical expenses near the target, lowered in case the actual exceeds the target and raised if the actual falls short of the target.

Actual > Target ⇒ Conversion factor decreased

Target < Actual ⇒ Conversion factor increased

A. SGR model-based conversion factor calculation

1) Calculation of the conversion factor for 2010

$$\text{Conversion Factor}_{2010} = \text{Conversion Factor}_{2009} \times \text{Conversion Factor Update}_{2010}$$

2) Conversion factor update for 2010

$$\text{Conversion Factor Update}_{2010} = MEI_{2010} \times PAF_{2010}$$

MEI_{2010} : Growth rate of the Medical Economic Index

PAF_{2010} : Adjustment component of the difference between the target and actual medical fees

3) $MEI_{2010} = \Sigma$Weight per cost item×Price update per item

4) $PAF_{2010} = \{(Target_{2009} - Actual_{2009}) / Actual_{2009}\} \times 0.75 + \{(Target_{t0\text{-}2009} - Actual_{t0\text{-}2009}) / Actual_{2009}(1+SGR_{2010})\} \times 0.33$

$Target_{2010} = Target_{2009} \times SGR_{2010}$

$Target_{t0} = Actual_{t0}$

5) SGR calculation

SGR_{2010} = Change rate of the practice fee × Change rate of the number of beneficiaries × Change rate of the population structure × Change rate of the real GDP per capita × Change rate from laws and regulations

B. SGR estimation method

□ Change rate of the practice fee

- The conversion factor applied to SGR differs depending on the understanding of the change rate of practice fee.
- Increase rate of practice fee in the US SGR model refers to the increase in the costs for providing "Medicare Services" included in the target, not just the increase rate of practice fees. Therefore, the SGR model applies a certain weight to elements as the growth rate of Diagnostic Laboratory Test (DLT) expenses and the change rate of drug prices as well as the MEI.

□ Change rate of the number of beneficiaries

- Change rate of the number of beneficiaries = Change rate of the number of beneficiaries covered by health insurance

□ Change rate of the population structure

- Change rate of the population structure reflects the changes in the intensity of medical services from ageing. It is calculated by changes in the practice fee per age group segmented into 5 years of age.
- Changes in the practice fee from population structure change

$$= \frac{\sum_i Number\ of\ applied\ population_{i,t} \times Medical\ fee\ per\ capita_{i,t-1}}{\sum_i Number\ of\ applied\ population_{i,t-1} \times Medical\ fee\ per\ capita_{i,t-1}} \times \frac{Number\ of\ population_{t-1}}{Number\ of\ population_t}$$

(i= Age group segmented into 5 years of age, t=year)

□ Change rate from laws and regulations

- Change rate from laws and regulations =

$$1 + \frac{Increase/decrease\ of\ practice\ fee\ from\ service\ item\ adjustment_t}{Total\ service\ fee_t - Increase/decrease\ of\ practice\ fee\ from\ service\ item\ adjustment_t}$$

C. Assessment of the SGR model

□ Positive aspects of the SGR model are as follows:

- The SGR model has been developed in the US to calculate the relative value conversion factor. It is, therefore, considered theoretically and empirically validated to a certain level.
- The SGR model is easy to understand since the formula used to calculate the MEI and PAF is very clear.
- Calculation itself is convenient, just insert necessary data into the formula.
- Data reliability and objectivity is higher than the financial performance analysis since the model uses macro indices instead of data from medical institutions, leaving little room for disputes.
- The SGR model, being a type of the target budgeting system, can be used to prevent sudden increase of medical expenses by decreasing the conversion factor if the medical fee increases too high.

□ Negative aspects of the model are as follows:

- A large gap may occur in the conversion factor values depending on the base point for applying the SGR model.
  - Most recent studies calculate the conversion factor using 2004 as the base year, which is disputable since the ground for this assumption is weak.
  - This may result in providers and subscribers claiming to change the base year according to their own interests, leading to a confusion in calculating the conversion factor.

- While the SGR model uses macro indices and is less disputable than the financial performance analysis, it may also produce different outcome depending on the macro data used in the formula.
  - For example, the resulting conversion factor will be different based on whether the practice fee applied is the actual conversion factor growth rate or the MEI value.
  - Macro indices may also vary depending on the point of announcement. In case estimates are announced in a certain year at the time of conversion factor calculation, the outcome will be different from the way the next year's macro indices are estimated.
- If the model is used for a long time, the resulting conversion factor may either be too large or small.
  - The resulting conversion factor is not stable if the actual and the target expenditure do not move within a close range.

3. Cost Analysis Model based Conversion Factor Calculation

A. Model Overview

1) Cost Analysis-based Conversion Factor Calculation

□ The cost analysis method calculates the conversion factor using the cost accounting model, by estimating the cost matching the health insurance covered practice revenues.

The method can be divided into cost based conversion factor and financial performance based conversion factor according to the definition of cost objects.

- Cost based conversion factor limits cost objects to health insurance covered medical practices, comparing the costs matching the objects. The method is used to adjust the conversion factor by identifying the cost maintenance ratio within the scope of Korea's health insurance benefit.
- In order to calculate the cost-based conversion factor, just the health insurance covered practice revenues (excluding revenues occurring from non-medical business and health insurance covered medical practices) should be identified and the expense matching such revenues estimated. This expense is then matched to the relative value units (RVUs) to calculate the cost-based conversion factor.

$$\text{Conversion factor} = \frac{Total\ \text{costs} - Uncovered\ \text{costs}}{Covered\ relative\ value\ scale}$$

- For calculating cost-based conversion factor, specific expense details of the medical institution is required. Existing studies calculated cost-based conversion factors with the expense details submitted by medical institutions, causing controversies over the representativeness and reliability of the data submitted.
- Furthermore, the overall process of estimating the expense matching health insurance covered services from the total costs is not sufficiently objective because the method for calculating the relative value

score of uncovered services has not been proven using actual data. Therefore, cost-based conversion factor calculation is highly disputable.

2) Financial Performance-based Conversion Factor Calculation

□ The financial performance analysis includes uncovered services in cost objects. The conversion factor is calculated by comparing just the health insurance expenses (excluding revenues from uncovered medical practices) of the medical fee required for servicing health insurance covered patients, to the income from health insurance covered services.

□ While the cost-based method calculates the conversion factor by identifying the cost recovery rate of each medical service provided, the financial performance-based method identifies the income and expense of medical institutions in the business aspect, calculates the surplus/deficit rate where the payments are balanced and compares the results to the current fee level to calculate the conversion factor.

$$\text{Conversion factor} = \frac{Total\ costs - Uncovered\ costs}{Covered\ relative\ value\ scale}$$

□ The scope of financial performance may vary based on the revenues and expenses included, and thus, the outcome may be different.

B. Assessment of the Model

□ Studies on cost or financial performance based conversion

factor adopt research methods as field surveys on medical institutions. However, it is difficult to select a medical institution sufficiently representative in the mathematical or statistical aspect and the objectivity of the data submitted by institutions cannot be guaranteed.

- At present, it is difficult for professional resources to carry out such surveys since it will take too much time and effort.

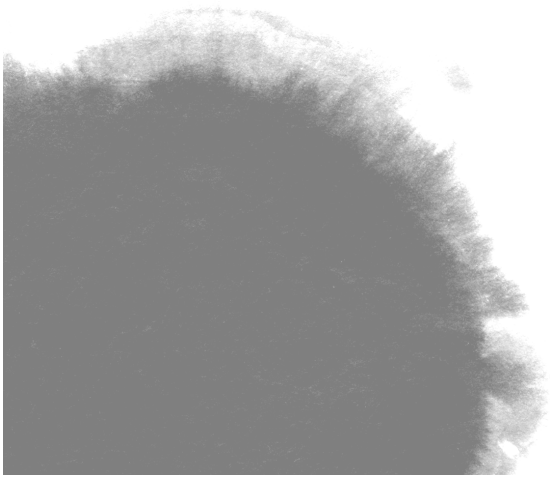
□ In case of cost-based conversion factor, there are efforts to identify costs in a reasonable way to estimate the relative value of uncovered medical services. Despite such efforts, the outcome may include errors since it is not possible to precisely identify the relative value score from limited data.

- Under the circumstances where the revenues and expenses must be estimated, the cost matching health insurance covered services is also extracted from total costs based on various assumptions. Therefore, the outcome is neither reliable nor objective, and not appropriate as the conversion factor.

□ While cost-based conversion factor is excellent in theory, it has a crucial flaw of not being able to collect accurate and reliable data. The model is therefore limited in the fact that the outcome is inappropriate and useless.

03

Results of the Study on Conversion Factor by Model



CHAPTER 3
Results of the Study on Conversion Factor by Model

1. Index model

A. Calculation process

□ Calculation process

○ Revenue growth rate

- The yearly data of 2009 is estimated based on the health insurance and medical benefit data of 1H 2009, the most recent data available.
- Number of institutions by type is identified.
- Revenue growth rate of each institution type is calculated.
  - The revenue growth rate of the total medical fee and of the practice fees are calculated.

○ Cost growth rate

- Proportion of costs (labor, maintenance and materials costs) is estimated.
- Growth rate of each costs are calculated.
- MEI growth rate is calculated.
- MEI growth rate is compensated by applying the increase of input.

○ Conversion factor calculation: When using the growth rate

of health insurance-covered revenue and matching costs.

− $F' = F \times (1+\delta)$

$= \mathbf{F} \times \left[1 + \frac{p-s}{(1+s)\ a}\right]$

B. Index model outcome

□ Revenue growth, the most important element in the index model, is based on the increase in the medical fees of health insurance and medical benefit, where 2H 2009 revenues from medical services is estimated from medical service performances in 1H 2009.

− As with existing precedent studies, estimations are made by applying the ratio of 2H 2008 to 1H 2008.

〈Table 1〉 Growth of total medical fee revenues by health insurance-covered medical institutions in 2009

(Unit: 1 million KRW)

Health Insurance	Number of institutions		Total medical fee			Medical fee by institution		
Type	2008	2009	2008	2009	Increase rate	2008	2009	Increase rate
General specialty hospital	43	44	5,259,599	6,390,951	21.5%	122,316	145,249	18.75%
General hospital	268	269	5,288,177	5,745,133	8.6%	19,732	21,357	8.24%
Hospital	1,190	1,228	2,892,869	3,433,938	18.7%	2,431	2,796	15.03%
Nursing home	690	733	998,828	1,337,701	33.9%	1,448	1,825	26.07%
Clinic	26,521	26,827	8,234,143	8,756,731	6.3%	310	326	5.13%
Dental hospital	167	175	62,996	73,141	16.1%	377	418	10.80%
Dental clinic	13,719	13,999	1,073,286	1,154,628	7.6%	78	82	5.43%
Oriental medicine hospital	145	144	102,787	116,273	13.1%	709	807	13.91%

Health Insurance	Number of institutions		Total medical fee			Medical fee by institution		
Type	2008	2009	2008	2009	Increase rate	2008	2009	Increase rate
Oriental medicine clinic	11,321	11,629	1,257,998	1,470,619	16.9%	111	126	13.81%
Midwifery clinic	51	50	547	463	-15.4%	11	9	-13.69%
Pharmacy	20,841	20,913	9,543,575	10,375,471	8.7%	458	496	8.34%

〈Table 2〉 Growth of total medical fee revenues by medical benefit institutions in 2009

(Unit: 1 million KRW)

Medical benefit	Number of institutions		Total medical fee			Medical fee by institution		
Type	2008	2009	2008	2009	Increase rate	2008	2009	Increase rate
General specialty hospital	43	44	524,856	510,536	-2.7%	12,206	11,603	-4.94%
General hospital	268	269	909,571	946,214	4.0%	3,394	3,518	3.64%
Hospital	1,190	1,228	857,004	1,024,611	19.6%	720	834	15.86%
Nursing home	690	733	392,503	508,779	29.6%	569	694	22.02%
Clinic	26,521	26,827	712,766	733,030	2.8%	27	27	1.67%
Dental hospital	167	175	1,530	1,880	22.9%	9	11	17.25%
Dental clinic	13,719	13,999	41,829	46,040	10.1%	3	3	7.86%
Oriental medicine hospital	145	144	11,538	11,017	-4.5%	80	77	-3.85%
Oriental medicine clinic	11,321	11,629	70,299	87,533	24.5%	6	8	21.22%
Midwifery clinic	51	50	1	1	-4.0%	0	0	-2.03%
Pharmacy	20,841	20,913	940,571	984,355	4.7%	45	47	4.29%

□ Regarding health insurance and medical benefit fees in total, nursing homes showed the highest growth of 32.7%, general specialty hospitals 19.3% and hospitals 18.9% while clinics and dental clinics showed a low growth rate of 6.1% and 7.7%, respectively.

〈Table 3〉 Growth of total medical fee revenues by health insurance and medical benefit institutions in 2009

(Unit: 1 million KRW)

Health insurance +Medical benefit	Number of institutions		Total medical fee			Medical fee by institution		
Type	2008	2009	2008	2009	Increase rate	2008	2009	Increase rate
General specialty hospital	43	44	5,784,455	6,901,487	19.3%	134,522	156,852	16.60%
General hospital	268	269	6,197,747	6,691,346	8.0%	23,126	24,875	7.56%
Hospital	1,190	1,228	3,749,872	4,458,549	18.9%	3,151	3,631	15.22%
Nursing home	690	733	1,391,332	1,846,480	32.7%	2,016	2,519	24.93%
Clinic	26,521	26,827	8,946,909	9,489,761	6.1%	337	354	4.86%
Dental hospital	167	175	64,526	75,021	16.3%	386	429	10.95%
Dental clinic	13,719	13,999	1,115,115	1,200,667	7.7%	81	86	5.52%
Oriental medicine hospital	145	144	114,325	127,290	11.3%	788	884	12.11%
Oriental medicine clinic	11,321	11,629	1,328,297	1,558,152	17.3%	117	134	14.20%
Midwifery clinic	51	50	548	464	-15.4%	11	9	-13.66%
Pharmacy	20,841	20,913	10,484,146	11,359,826	8.4%	503	543	7.98%

□ The conversion factor is based on practice fee and the increase in practice fee is more important than the total

medical fee. Thus, the growth of practice fee revenues should be identified.

- For this purpose, the growth of practice fee revenues have been extracted by investigating the proportion of medical care benefit expenses of the four major medical fee types from the Health Insurance Review & Assessment Service (HIRA).

〈Table 4〉 Proportion of medical care benefit expenses of four major medical fee types in 2009

(Unit: %)

Type	Basic medical fee	Medical practice fee	Drug costs	Material costs	Total
General specialty hospital	18.72	46.65	24.09	10.54	100
General hospital	29.21	42.74	18.59	9.46	100
Hospital	45.22	37.25	11.34	6.19	100
Nursing home	55.30	33.16	11.28	0.25	100
Clinic	61.02	31.68	5.10	2.20	100
Dental hospital	36.85	59.24	1.56	2.35	100
Dental clinic	39.20	57.85	0.56	2.38	100
Oriental medicine hospital	61.21	37.71	1.08	0.00	100
Oriental medicine clinic	43.08	55.92	1.00	0.00	100
Pharmacy	0.00	23.94	76.06	0.00	100

Source: Health Insurance Review & Assessment Service (HIRA), Health insurance review statistics index, 2008, 2009

〈Table 5〉 Growth of practice fee revenues by health insurance covered institutions in 2009

(Unit: 1 million KRW)

Health insurance	Number of institutions		Practice fee			Practice fee by institution		
Type	2008	2009	2008	2009	Increase rate	2008	2009	Increase rate
General specialty hospital	43	44	3,417,230	4,200,104	22.9%	79,470	95,457	20.12%
General hospital	268	269	3,796,435	4,152,366	9.4%	14,166	15,436	8.97%
Hospital	1,190	1,228	2,313,093	2,738,586	18.4%	1,944	2,230	14.73%
Clinic	26,521	26,827	7,662,275	8,110,782	5.9%	289	302	4.65%
Dental hospital	167	175	59,789	69,908	16.9%	358	399	11.58%
Dental clinic	13,719	13,999	1,038,582	1,120,053	7.8%	76	80	5.69%
Oriental medicine hospital	145	144	101,471	114,966	13.3%	700	798	14.09%
Oriental medicine clinic	11,321	11,629	1,242,454	1,456,561	17.2%	110	125	14.13%
Pharmacy	20,841	20,913	2,365,856	2,480,066	4.8%	114	119	4.47%

〈Table 6〉 Growth of practice fee revenues by medical benefit institutions in 2009

(Unit: 1 million KRW)

Medical benefit	Number of institutions		Practice fee			Practice fee by institution		
Type	2008	2009	2008	2009	Increase rate	2008	2009	Increase rate
General specialty hospital	43	44	341,006	335,522	-1.6%	7,930	7,625	-3.84%
General hospital	268	269	652,990	683,888	4.7%	2,437	2,542	4.34%
Hospital	1,190	1,228	685,247	817,134	19.2%	576	665	15.56%
Clinic	26,521	26,827	663,264	678,958	2.4%	25	25	1.20%
Dental hospital	167	175	1,452	1,797	23.7%	9	10	18.08%
Dental clinic	13,719	13,999	40,476	44,661	10.3%	3	3	8.13%
Oriental medicine hospital	145	144	11,390	10,894	-4.4%	79	76	-3.70%
Oriental medicine clinic	11,321	11,629	69,431	86,696	24.9%	6	7	21.56%
Pharmacy	20,841	20,913	233,168	235,292	0.9%	11	11	0.56%

□ The growth of practice fee revenues was similar to that of medical fee revenues, with general specialty hospitals showing a rate of 20.7%, hospitals 18.6% and oriental medicine clinic 17.6%.

〈Table 7〉 Growth of practice fee revenues by health insurance and medical benefit institutions in 2009

(Unit: 1 million KRW)

Health insurance+Medical benefit	Number of institutions		Practice fee			Practice fee by institution		
Type	2008	2009	2008	2009	Increase rate	2008	2009	Increase rate
General specialty hospital	43	44	3,758,236	4,535,626	20.7%	87,401	103,082	17.94%
General hospital	268	269	4,449,425	4,836,254	8.7%	16,602	17,979	8.29%
Hospital	1,190	1,228	2,998,340	3,555,720	18.6%	2,520	2,896	14.92%
Clinic	26,521	26,827	8,325,539	8,789,740	5.6%	314	328	4.37%
Dental hospital	167	175	61,242	71,705	17.1%	367	410	11.73%
Dental clinic	13,719	13,999	1,079,058	1,164,714	7.9%	79	83	5.78%
Oriental medicine hospital	145	144	112,861	125,860	11.5%	778	874	12.29%
Oriental medicine clinic	11,321	11,629	1,311,885	1,543,257	17.6%	116	133	14.52%
Pharmacy	20,841	20,913	2,599,024	2,715,358	4.5%	125	130	4.12%

□ In order to estimate the increase in costs matching the revenue growth in the index model, the accurate proportion of the medical institution's expenses must be identified.

- The cost increase rate depends on the ratio of labor, maintenance and materials costs that consist the costs of medical institutions.

– Existing precedent studies had limitations from each study applying different ratio and using outdated data.

〈Table 8〉 Cost structure ratio of medical institutions

ype	Total medical costs	Labor costs	Maintenance costs	Materials costs
General specialty hospital	100%	43.78%	34.81%	21.42%
General hospital	100%	45.40%	29.10%	25.50%
Hospital	100%	44.84%	30.02%	25.13%
Clinic	100%	55.26%	33.71%	11.03%
Dental hospital	100%	55.32%	15.95%	28.73%
Dental clinic	100%	51.78%	27.09%	21.13%
Oriental medicine hospital	100%	38.84%	34.13%	27.03%
Oriental medicine clinic	100%	50.77%	30.85%	18.39%
Pharmacy	100%	65.62%	30.52%	3.86%

□ The most recent data available were used in this study, specifically "2007 Hospital Business Analysis" of KHIDI for institutions above hospital level and 2005 joint study data for clinic level institutions and pharmacies.

〈Table 9〉 Increase rate of the structure ratio required for calculating the MEI growth rate

(Unit: KRW)

		2002	2003	2004	2005	2006	2007	2008	2009	
									2008 2/4	2009 2/4
Labor costs		1,824,438	1,953,116	2,059,194	2,259,005	2,460,919	2,550,318	2,597,007	2,589,092	2,626,588
Increase rate			7.05%	5.43%	9.70%	8.94%	3.63%	1.83%	1.45%	
Maintenance costs		90.76	93.95	97.32	100.00	102.20	104.80	109.70	109.60	112.70
Increase rate			3.51%	3.59%	2.75%	2.20%	2.54%	4.68%	2.83%	
Materials costs	Medicinal products for human use	99.9	99.6	99	100	98.9	98.5	99.8	99.1	102.9
	Increase rate		-0.30%	-0.60%	1.01%	-1.10%	-0.40%	1.32%	3.83%	
	Medical instruments	92.5	97.1	98.4	100	102.3	102.4	102.4	102.4	102.1
	Increase rate		4.97%	1.34%	1.63%	2.30%	0.10%	0.00%	-0.29%	
	Health industry	98.90	99.26	98.92	100.00	99.36	99.03	100.15	99.55	102.79
	Increase rate		0.37%	-0.34%	1.09%	-0.64%	-0.33%	1.13%	3.26%	

Note: Labor costs increase rate is based on the health industry labor costs and the base data used is the survey on wage and working hours of companies (former Monthly Labor Statistics) by the Ministry of Labor.

Maintenance costs is based on the total consumer price index, Statistics Korea.

Materials costs is based on the health producer price index (weighted average of the medicinal products for human use PPI and medical instruments PPI), Statistics Korea.

□ The increase rate of labor costs in 2009 was estimated based on the latest performance data available up to 2Q 2009 compared to 2Q 2008.

  – The increase rate of maintenance and materials costs were estimated in the same way.

□ Labor costs increase rate is based on the survey on wage and working hours of companies by the Ministry of Labor, of which the most recent data was available and was utilized by existing precedent studies.

□ Maintenance costs CPI and materials costs health PPI is based on the data from Statistics Korea, the same data used in precedent studies.

〈Table 10〉 Changes in hired labor by institution in 2009

(Unit: Number of people)

Type	2007	2008	2009	Difference	Human capital index by institution
General specialty hospital	403.84	452.3	480.68	28.38	106.27
General hospital	64.12	68.41	69.55	1.14	101.67
Hospital	10.73	11.35	11.79	0.44	103.88
Nursing home	7.40	7.52	8.00	0.48	106.38
Clinic	1.69	1.69	1.71	0.02	101.18
Dental hospital	10.12	10.16	10.01	-0.15	98.52
Dental clinic	1.17	1.18	1.18	0.00	100.00
Oriental medicine hospital	8.89	8.91	9.34	0.43	104.83
Oriental medicine clinic	1.10	1.10	1.10	0.00	100.00
Health institution	1.19	1.21	1.26	0.05	104.13
Pharmacy	1.36	1.36	1.35	-0.01	99.26

Source: Health Insurance Review & Assessment Service (HIRA), Health insurance review statistics index, 2008, 2009

□ When calculating the cost increase rate, unit cost increase can be calculated by applying the increase rate of labor, maintenance and materials costs, with the increase in the production factor input reflected.

- Cost increase factor: Costs=Unit cost*Production factor input

□ Existing precedent studies complemented the increase in production factor input by applying the increase in hired labor by institution. The same rate was applied to maintenance and materials costs.

□ In this study, however, it was presumed that the maintenance and materials costs increased from the increase in the actual number of patients, not maintenance resources, and thus, these costs were compensated by applying the increase rate of adjusted number of patients.

〈Table 11〉 MEI growth rate by medical institution

	2003	2004	2005	2006	2007	2008	2009	20091)
General specialty hospital	1.04390	1.03554	1.05441	1.04542	1.02404	1.02672	1.02316	1.10436
General hospital	1.04319	1.03423	1.05485	1.04535	1.02304	1.02481	1.02311	1.05080
Hospital	1.04311	1.03427	1.05453	1.04508	1.02309	1.02510	1.02318	1.08954
Clinic	1.05123	1.04174	1.06411	1.05610	1.02828	1.02713	1.02113	1.03791
Dental hospital	1.04568	1.03478	1.06121	1.05112	1.02319	1.02085	1.02188	1.04972
Dental clinic	1.04682	1.03713	1.06002	1.05090	1.02500	1.02454	1.02204	1.02830
Oriental medicine hospital	1.04039	1.03242	1.05004	1.04050	1.02189	1.02613	1.02408	1.08972
Oriental medicine clinic	1.04732	1.03802	1.05977	1.05099	1.02567	1.02580	1.02207	1.04547
Pharmacy	1.05715	1.04647	1.07250	1.06512	1.03147	1.02672	1.01939	1.01283

Note: 1) The growth rate reflects the changes in hired labor and adjusted number of patients by institution.

□ Considering the revenue growth rate and ratio increase rate, the conversion factor update is as follows:

〈Table 12〉 2009 conversion factor update (based on revenue by institution)

	Revenue growth rate	MEI growth rate	Practice fee ratio	Conversion factor update			
				Total medical fee		Practice fee	
				Small scale classification	Medium scale classification	Small scale classification	Medium scale classification
General specialty hospital	1.166	1.104	0.657	-8.04%	-5.09%	-6.36%	-4.88%
General hospital	1.092	1.051	0.723	-5.18%		-2.96%	
Hospital	1.099	1.090	0.798	-1.07%		-5.19%	
Clinic	1.045	1.038	0.926	-0.69%	-0.69%	-0.56%	-0.56%
Dental hospital	1.063	1.050	0.956	-1.31%	-1.40%	-6.05%	-2.98%
Dental clinic	1.043	1.028	0.970	-1.41%		-2.79%	
Oriental medicine hospital	1.113	1.090	0.989	-2.15%	-6.73%	-2.96%	-8.28%
Oriental medicine clinic	1.125	1.045	0.990	-7.10%		-8.71%	
Pharmacy	1.079	1.013	0.239	-25.49%	-25.49%	-2.72%	-2.72%
Midwifery clinic	0.863	1.022	0.928	19.80%	19.80%	18.37%	18.37%

〈Table 13〉 2009 conversion factor update (based on total revenue)

	Revenue growth rate	MEI growth rate	Practice fee ratio	Conversion factor update			
				Total medical fee		Practice fee	
				Small scale classification	Medium scale classification	Small scale classification	Medium scale classification
General specialty hospital	1.193	1.104	0.657	-11.32%	-8.50%	-5.29%	-4.32%
General hospital	1.079	1.051	0.723	-3.70%		-2.31%	
Hospital	1.189	1.089	0.798	-10.49%		-5.44%	
Clinic	1.061	1.038	0.926	-2.32%	-2.32%	-1.02%	-1.02%
Dental hospital	1.163	1.049	0.956	-10.16%	-4.97%	-5.39%	-2.72%
Dental clinic	1.077	1.028	0.970	-4.64%		-2.55%	
Oriental medicine hospital	1.113	1.089	0.989	-2.15%	-10.33%	-2.80%	-8.03%
Oriental medicine clinic	1.173	1.045	0.990	-10.98%		-8.45%	
Pharmacy	1.083	1.012	0.239	-27.29%	-27.29%	-6.20%	-6.20%
Midwifery clinic	0.846	1.022	0.928	22.35%	22.35%	20.74%	20.74%

2. SGR Model

A. Calculation process and outcome

□ For the SGR model, the purpose is to select the most appropriate method through comparative analysis of the latest conversion factor studies, one by NHIC (Jinhyun Kim and others, 2009) and the other, by the provider (Dongil Oh and others, 2009), and calculate a reasonable conversion factor.

1) Health MEI estimation

〈Table 14〉 Proportion of costs by item in precedent studies

(Unit: %)

Item	Indicator details	General specialty hospital		General hospital		Hospital	
		Provider	NHIC	Provider	NHIC	Provider	NHIC
Labor costs	Labor costs total-Labor costs proportion	41.0%	44.0%	50.0%	44.0%	48.0%	44.0%
	Medical specialist	9.0%		14.0%		14.0%	
	Resident, Intern	5.0%		3.0%		1.0%	
	Dentist	0.0%		0.0%		0.0%	
	Oriental doctor	0.0%		0.0%		0.0%	
	Nurse	11.0%		15.0%		12.0%	
	Nursing assistant	2.0%		3.0%		4.0%	
	Pharmacist	1.0%		1.0%		1.0%	
	Nutritionist	1.0%		1.0%		1.0%	
	Medical technician	4.0%		5.0%		5.0%	
	Clerical & Technical staff	4.0%		8.0%		8.0%	
	Other occupation type	5.0%		1.0%		2.0%	
Maintenance costs	Maintenance costs total	24.0%		20.0%		19.0%	
	General maintenance costs*		15.4%	3.3%	13.3%		11.0%
	Other employee benefits	5.0%	*	3.0%	*	3.0%	*
	Traveling expense and car fare	0.0%		0.0%		0.0%	
	Communication expenses	0.0%		0.0%		0.0%	
	Electricity & water charges	1.0%	1.2%	1.0%	1.3%	2.0%	1.2%
	Taxes and Dues	0.0%	*	1.0%	*	1.0%	*
	Insurance premium	0.0%		0.0%		0.0%	
	Environment maintenance costs	0.0%		0.0%		0.0%	
	Rent payable	1.0%		0.0%		0.0%	
	Commissions paid	1.0%		1.0%		2.0%	
	Repair costs	1.0%	*	1.0%	*	1.0%	*
	Vehicle maintenance expenses	0.0%		0.0%		0.0%	
	Education and training expense	0.0%		0.0%		0.0%	
	Books printing expenses	0.0%		0.0%		0.0%	

Item	Indicator details	General specialty hospital		General hospital		Hospital	
		Provider	NHIC	Provider	NHIC	Provider	NHIC
	Reception expenses	0.0%		0.0%		0.0%	
	Event expenses	0.0%		0.0%		0.0%	
	Fuel expenses	1.0%	1.1%	1.0%	1.0%	0.0%	0.6%
	Missionary work expenses	0.0%		0.0%		0.0%	
	Medical social work expenses	0.0%		0.0%		0.0%	
	Supplies expenses	0.0%		1.0%		1.0%	
Maintenance costs	Research expenses	1.0%	*	0.0%	*	0.0%	*
	Depreciation_total	6.0%	*	5.0%	*	4.0%	*
	Advertisement expenses	0.0%		0.0%		0.0%	
	Bad debt expense	0.0%		0.0%		0.0%	
	Clothing and bedding expenses	0.0%	0.2%	0.0%	0.2%	0.0%	
	Outsourcing costs	5.0%	*	3.0%	*	2.0%	*
	Building maintenance costs	0.0%		0.0%		0.0%	
	Lab test expenses	0.0%		0.0%		0.0%	
	Transportation expenses	0.0%		0.0%		0.0%	
	Miscellaneous expenses	0.0%		0.0%		0.0%	
	Others	1.0%	6.7%	1.0%	7.0%	0.0%	15.6%
Materials costs	Materials costs total	35.0%	31.4	29%	33.2%	32%	27.6%
	Drug costs	19.0%	17.0%	16%	16.1%	16%	16.4%
	Medical materials costs	15.0%	13.2%	10%	13.8%	12%	6.7%
	Meal materials costs	1.0%	1.2%	2%	3.3%	4%	4.5%

□ While the provider's study classified the proportion of costs for MEI calculation in detailed segments, NHIC study maintained the classification level used in the 2003 SGR study.

□ NHIC also applied the proportion of medical institution costs in different rates for SGR model calculation and the index model calculation as follows:

〈Table 15〉 Proportion of costs by item (NHIC study-Institutions below clinic level)

(Unit: %)

Type	Proportion of labor costs[1]	Maintenance costs		Materials costs	
		Classification	Proportion	Classification	Proportion
Clinic	58.4	Rental, building related	10.2	Materials costs	16.0
		General maintenance costs[2]	15.4		
Dental clinic	52.4	Rental expenses	6.8	Materials costs	18.6
		General maintenance costs[2]	22.2		
Oriental medicine clinic	59.6	General maintenance costs[2]	17.7	Medicinal costs	12.1
		Electricity expenses	2.0	Treatment and materials costs	1.4
		Water expenses	0.6	Other	4.1
		Fuel expenses	1.1		
		Communication expenses	1.4		
Pharmacy	65.3	General maintenance costs[2]	29.9	Materials costs	4.3
		Rental, building related	0.4	Drug costs	0.0
		Loss from drugs not usable	0.0		
		Pharmacy equipments, furniture and fixtures	0.0		

〈Table 16〉 Proportion of costs of medical institutions (for the Index model - NHIC study)

(Unit: %)

Classification	Total	Labor costs	Maintenance costs	Materials costs
General specialty hospital	100.0	38.5	25.9	35.6
General hospital	100.0	45.5	22.0	32.5
Hospital	100.0	44.4	23.4	32.2
Clinic	100.0	62.2	23.3	14.5
Dental hospital	100.0	48.2	37.1	14.7
Dental hospital	100.0	52.4	29.0	18.6
Oriental medicine hospital	100.0	48.2	37.1	14.7
Oriental medicine clinic	100.0	68.0	26.3	5.7
Pharmacy	100.0	55.0	40.4	4.6

Note: 1) Hospital ratio was assumed for dental hospital and oriental medicine hospital, clinic ratio for health institutions and clinic rates to the total (excluding pharmacy).

2) Proportion of labor, maintenance and materials costs of general specialty hospital, general hospital, hospital is based on the Hospital Business Statistics data of the Korean Hospital Association (KHA).

Source: Byongho Tchoe and others, Development of the conversion factor calculation model of the relative value medical practice fee, KiHASA, 2003.
NHIC Research Center, SGR index model based conversion factor calculation, 2004.

□ This study used the proportion of costs used for calculating the MEI growth rate in the index model. The data for institutions above hospital level is based on the "2007 Hospital Business Analysis" of KHIDI and on the 2005 joint study data for clinic level institutions and pharmacies.

〈Table 17〉 Proportion of costs of medical institutions in this study

(Unit: %)

	Total medical costs	Labor costs	Maintenance costs	Materials costs
General specialty hospital	100.00%	43.78%	34.81%	21.42%
General hospital	100.00%	45.40%	29.10%	25.50%
Hospital	100.00%	44.84%	30.02%	25.13%
Clinic	100.00%	55.26%	33.71%	11.03%
Dental hospital	100.00%	55.32%	15.95%	28.73%
Dental clinic	100.00%	51.78%	27.09%	21.13%
Oriental medicine hospital	100.00%	38.84%	34.13%	27.03%
Oriental medicine clinic	100.00%	50.77%	30.85%	18.39%
Pharmacy	100.00%	65.62%	30.52%	3.86%

〈Table 18〉 Growth rate of macro-economic indices and labor costs_(NHIC study)

Classification		2004	2005	2006	2007	2008		2009
						NHIC	KiHASA	KiHASA
Total CPI		1.0359	1.0275	1.0220	1.0254	1.0433	1.0458	1.0283
Rental CPI		1.0158	0.9979	1.0040	1.0179	1.0205	1.0196	1.0163
Total PPI		1.0607	1.0215	1.0090	1.0139	1.0708	1.0890	0.9901
Electricity, water and city gas PPI		1.0092	1.0121	1.0740	1.0354	1.0488	1.0315	1.0462
Crude and refined PPI		1.1314	1.1274	1.1110	1.0540	1.4013	1.4304	0.7570
Textile and clothing PPI		1.0316	0.9872	0.9580	0.9749	1.0161	1.0257	1.0564
Medicinal products for human use PPI		0.9940	1.0101	0.9890	0.9960	1.0000	1.0061	1.0383
Groceries PPI		1.0548	1.0384	1.0170	1.0226	1.0913	1.1067	1.0895
Health PPI2)		0.9966	1.0109	0.9936	0.9967	1.0000	1.0053	1.0327
Medical instrument PPI		1.0134	1.0163	1.0230	1.0010	0.9998	1.0000	0.9971
Increase rate of health industry labor costs	NHIC	1.0544	1.1223	1.0992	1.0393	1.0450		
	KiHASA	1.0543	1.0970	1.0894	1.0363		1.0183	1.0145

□ In this study, the growth rate in 2009 has been substituted by growth rate of 2Q 2009 compared to 2Q 2008.

□ Health PPI is calculated as the weighted average of the growth rate of medicinal products for human use PPI and medical instrument PPI (weight applied - medicinal products for human use 7%, medical equipment 1.1%)

□ This study utilized the survey on wage and working hours of companies (former Monthly Labor Statistics) by the Ministry of Labor.

□ In conclusion, the same growth rate used in the index model was used.

〈Table 19〉 Growth rate index of the concerned year by cost item (Provider's study)

Cost item	Index details	2004	2005	2006	2007	2008
Labor costs	Labor costs_Health industry	1.096	1.079	1.032	1.066	1.066
Drug and materials costs	Producer_Medicinal products for human use	1.010	0.989	0.996	0.998	1.025
Other employee benefit	Labor costs_Health industry	1.096	1.079	1.032	1.066	1.066
Traveling expenses and car fare	Consumer_Car fare	1.050	1.046	1.036	1.295	1.036
Communication expenses	Consumer_Communication expenses	0.982	0.987	0.980	0.971	0.973
Electricity and water expenses	Consumer_Electricity expenses	1.061	1.078	1.025	1.232	1.035
Tax and dues	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Insurance premium	Producer_Insurance	0.985	1.003	0.999	1.004	1.004
Environment maintenance costs	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Rent payable	Consumer_Rent	0.998	1.004	1.018	1.045	1.045
Commissions paid	Consumer_Commission	1.022	1.085	1.050	1.111	1.045
Repairing costs	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Vehicle maintenance expenses	Consumer_Fuel expenses	1.061	1.078	1.025	1.232	1.035
Education and training expenses	Consumer_Total index	1.028	1.022	1.025	1.107	1.029

Cost item	Index details	2004	2005	2006	2007	2008
Books printing expenses	Consumer_Newspapers and books	1.016	1.023	1.029	1.070	1.029
Reception expenses	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Event expenses	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Fu다penses	Consumer_Fuel expenses	1.061	1.078	1.025	1.232	1.035
Missionary work expense	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Medical social work expenses	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Supplies expenses	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Research expenses	Consumer_Training expenses	1.028	1.019	1.037	1.093	1.028
Depreciation_total		1.000	1.000	1.000	1.000	1.000
Amortization of intangible asset		1.000	1.000	1.000	1.000	1.000
Amortization of improvement of leased property		1.000	1.000	1.000	1.000	1.000
Advertisement expenses	Consumer_Commission	1.022	1.085	1.050	1.111	1.045
Bad debt expense	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Clothing and bedding expenses	Consumer_Clothing service	1.009	1.030	1.027	1.025	1.038
Outsourcing costs	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Building maintenance costs	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Lab test expenses	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Transportation expenses	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Miscellaneous expenses	Consumer_Total index	1.028	1.022	1.025	1.107	1.029
Others	Consumer_Total index	1.028	1.022	1.025	1.107	1.029

□ The difference between the two growth rate is that, the base year in the provider's study (base year 2004) is one year earlier than NHIC study (base year 2005).

〈Table 20〉 MEI estimate by medical institution type

Type	Researcher	2004	2005	2006	2007	2008	2009
General specialty hospital	NHIC	1.0001	1.0268	1.0042	0.9768	0.9953	0.9921
	Provider_Total medical fee-based	1.0515	1.0366	1.0169	1.0457	1.0337	1.0369
	Provider_practice fee-based	1.0651	1.0522	1.0237	1.0613	1.0454	1.0495
General hospital	NHIC	0.9996	1.0259	1.0032	0.9758	0.9951	0.9914
	Provider_Total medical fee-based	1.0459	1.0312	1.0072	1.0379	1.0264	1.0297
	Provider_practice fee-based	1.0687	1.0555	1.0234	1.0615	1.0471	1.0512
Hospital	NHIC	1.0043	1.0264	1.0036	0.9767	0.9996	0.9933
	Provider_Total medical fee-based	1.0568	1.0426	1.0188	1.0494	1.0376	1.041
	Provider_practice fee-based	1.0704	1.0582	1.0254	1.0643	1.049	1.0534
Hospital total	NHIC	1.0009	1.0264	1.0037	0.9764	0.9966	0.9922
	Provider_Total medical fee based	1.0547	1.0404	1.0167	1.0472	1.0355	1.041
	Provider_practice fee-based	1.0699	1.0575	1.025	1.0637	1.0485	1.0529
Clinic	NHIC	0.994	1.028	1.0048	0.9689	0.9803	0.9847
Dental clinic		0.9962	1.0271	1.0048	0.9728	0.9845	0.9874
Oriental medicine clinic		0.9307	0.9655	0.9406	0.9031	0.9169	0.9202
Pharmacy		0.9944	1.0314	1.0064	0.9648	0.979	0.9834
Total		0.9945	1.0259	1.0024	0.9688	0.985	0.9854

□ The reason for the large gap in the MEI value of NHIC and the provider is from NHIC compensating the value by applying labor productivity.
  - While the result may differ based on the point of view, the outcome becomes negative if labor productivity is applied and such value is not realistic.
  - Therefore, this study complied with the provider's study result and did not apply labor productivity.

□ The provider's study separated medical and practice fees since the resulting SGR value or index will become different by the fee used.

〈Table 21〉 MEI in this study

	2003	2004	2005	2006	2007	2008	2009
General specialty hospital	1.04390	1.03554	1.05441	1.04542	1.02404	1.02672	1.02316
General hospital	1.04319	1.03423	1.05485	1.04535	1.02304	1.02481	1.02311
Hospital	1.04311	1.03427	1.05453	1.04508	1.02309	1.02510	1.02318
Clinic	1.05123	1.04174	1.06411	1.05610	1.02828	1.02713	1.02113
Dental hospital	1.04568	1.03478	1.06121	1.05112	1.02319	1.02085	1.02188
Dental clinic	1.04682	1.03713	1.06002	1.05090	1.02500	1.02454	1.02204
Oriental medicine hospital	1.04039	1.03242	1.05004	1.04050	1.02189	1.02613	1.02408
Oriental medicine clinic	1.04732	1.03802	1.05977	1.05099	1.02567	1.02580	1.02207
Pharmacy	1.05715	1.04647	1.07250	1.06512	1.03147	1.02672	1.01939

2) SGR elements

〈Table 22〉 Fee level change rate

Year	Researcher	Fee increase rate	Practice rate (%)	Practice rate adjusted fee increase rate[1)]
2004	NHIC	1.0265	67.9	1.0180
	Provider_All	1.0265	67.9	1.0202
	Provider_Hospital	1.0265	70.8	1.019
2005	NHIC	1.0299	67.5	1.0202
	Provider_All	1.0299	67.5	1.0202
	Provider_Hospital	1.0299	70.1	1.021
2006	NHIC	1.0350	66.3	1.0232
	Provider_All	1.0358	66.3	1.0237
	Provider_Hospital	1.0358	70.1	1.025
2007	NHIC	1.0230	66.3	1.0153
	Provider_All	1.0231	66.3	1.0153
	Provider_Hospital	1.0231	70.1	1.016
2008	NHIC	1.0194	66.2	1.0129
	Provider_All	1.0194	66.3	1.0129
	Provider_Hospital	1.015	70.1	1.011
2009	NHIC	0.9854[2)]	66.3	0.9903
	Provider_All	1.0261	66.3	1.0173
	Provider_Hospital	1.0255	70.1	1.017
	KiHASA	1.0222		
2010	KiHASA	1.0215		

Note 1) Practice rate-adjusted fee increase rate : (Fee increase rate-1)×Practice rate(%)/100 + 1
2) MEI estimate

Source: NHIC, Health Insurance Statistics Yearbook, Each year

□ Beside the fact that NHIC used MEI estimates and the provider used 3-year moving average, rest of the elements is same.

□ This study used 3-year moving average as with existing studies for the 2010 data.

〈Table 23〉 Changes in the number of beneficiaries

Year	Increase rate		
	NHIC	Provider	KiHASA
2004	1.0071	1.00572	1.0071
2005	1.0052	1.00042	1.0052
2006	1.0017	1.00037	1.0017
2007	1.0088	1.00865	1.0088
2008	0.9936	1.00315	1.0066
2009	1.0014	1.00406	1.0023
2010^{p}			1.0059

□ In NHIC study, the 2008 estimates are projections based on the increase rate of the number of health insurance beneficiaries of 1H 2008 compared to 1H 2007 and the 2009 estimates are calculated using 3-year moving average.

  − The data is based on NHIC, Health Insurance Statistics Yearbook (each year), Major health insurance statistics (each year).

□ The provider's study utilized the 2007 Health Insurance Statistics Index from HIRA but using the current status of beneficiaries by health insurance subscriber type as of end December 2007.

□ KiHASA used the 3-year moving average for 2010 estimates.

〈Table 24〉 Changes in the population structure

Year	Overall medical institution			Medical institutions (including hospitals)	Pharmacy
	NHIC	Provider	KiHASA	Provider	Provider
2004	1.0123	1.0123	1.0123	1.0116	1.0135
2005	1.0124	1.0124	1.0124	1.0117	1.0269
2006	1.0107	1.0107	1.0107	1.0101	1.0121
2007	1.0200	1.0284	1.0200	1.0275	1.0308
2008	1.0092	1.0172	1.0179	1.0152	1.0208
2009	1.0133	1.0225	1.0103	1.0176	1.0212
2010[p]			1.0161		

□ NHIC study calculated the structure using the number of population per age and the medical fee performance data from the Health Insurance Statistics Yearbook. The change rate for 2008 was calculated using the proportion of medical fee in 1H from the annual medical fee per capita. The 2009 value is an estimate of 3-year moving average.

□ The provider's study used the 2007 Health Insurance Statistics Index from HIRA based on the review results by age group classified into 5 years of age as of December each year.

□ KiHASA used the 3-year moving average for 2010 estimates.

〈Table 25〉 Change rate of the real GDP per capita

Year	Increase rate		
	NHIC	Provider	KiHASA
2004	1.0434	1.0449	1.0436
2005	1.0398	1.0357	1.0343
2006	1.0479	1.0505	1.0500
2007	1.0463	1.0475	1.0491
2008	1.0496	1.0446	1.0235
2009	1.0479	1.0475	1.0408
2010			1.0378

□ In NHIC study, the 2008 estimates were based on the increase rate of 1H 2007 compared to 1H 2006 and the 2009 estimates is the value of 3-year moving average.

- The change rate of the real GDP per capita is based on the real GDP announced by the Bank of Korea and the yearly population projections from Statistics Korea.

□ The provider's study did not use estimates from Bank of Korea or other economic research institutes for 2008 and 2009 estimates. It calculated the GDP change rate using confirmed major indices of the National Accounts up to 2007 and 3-year moving average for 2008 and 2009.

- This was not only from the fact that the difference of the estimates and past averages is minimal but also that a GDP estimate for the following year has not been proven useful compared to the moving average outcome and may raise disputes for its complexity and assumptions.

□ This study is based on the GDP per capita from the Bank of Korea and the GDP deflator from Statistics Korea. These data were the basis for the estimates, made in the same way as the provider's study. The 2009 estimates are the outcome of 3-year moving average.

- The 2008 estimates are lower than in other studies, reflecting the financial crisis factor.

〈Table 26〉 Change rate from laws and regulations by medical institution type

Type	Researcher	2004	2005	2006	2007	2008	2009
All	NHIC	1.0033	1.0090	1.0266	1.0174	1.0000	-
	Provider	1.0033	1.0090	1.0266	1.0174	1.0000	1.0051
General specialty hospital	NHIC	1.0033	1.0272	1.0900	1.0360	1.0000	-
General hospital		1.0033	1.0093	1.0427	1.0295	1.0000	-
Hospital		1.0033	1.0152	1.0598	1.0690	1.0000	-
Hospital	Provider	1.0033	1.0175	1.0656	1.0396	1.0315	1.0386
Clinic	NHIC	1.0033	1.0000	1.0076	1.0085	1.0000	-
	Provider	1.0033	1.0000	1.0076	1.0085	1.0049	1.0052
Dental clinic	NHIC	1.0033	1.0000	1.0000	1.0001	1.0000	-
	Provider	1.0033	1.0000	1.0000	1.0001	1.0009	1.0002
Oriental medicine clinic	NHIC	1.0033	1.0000	1.0044	1.0057	1.0000	-
	Provider	1.0033	1.0000	1.0044	1.0057	1.0034	1.0034
Pharmacy	NHIC	1.0033	1.0000	1.0000	1.0000	1.0000	-
	Provider	1.0033	1.0000	1.0000	1.0000	1.0008	1.0002

〈Table 27〉 Change rate from laws and regulations by medical institution in this study

	2004	2005	2006	2007	2008	2009	2010
General specialty hospital	1.0033	1.0272	1.0900	1.0360	1.0017	1.0051	1.0143
General hospital	1.0033	1.0093	1.0427	1.0295	1.0011	1.0033	1.0113
Hospital	1.0033	1.0152	1.0598	1.0690	1.0009	1.0027	1.0242
Clinic	1.0033	1.0000	1.0076	1.0085	1.0007	1.0021	1.0038
Dental clinic	1.0033	1.0000	1.0000	1.0001	1.0000	1.0000	1.0000
Oriental medicine clinic	1.0033	1.0000	1.0044	1.0057	1.0000	1.0133	1.0063
Pharmacy	1.0033	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

□ The 2008 and 2009 change rate from laws and regulations was calculated by reflecting elements that may increase benefit revenues from uncovered items becoming covered, not from any changes in the legally specified out-of-pocket payment structure.

- E.g. Benefit coverage for burn patients, Expanded benefit coverage to anticancer drugs

□ For 2004, NHIC study applied the total growth rate to all types since the performance data by item was insufficient.

□ The provider's study utilized NHIC study details (2007) and the 2008 and 2009 estimates were from 3-year moving average.

〈Table 28〉 SGR outcome of existing precedent studies

Year	Fee change rate		Change rate of number of beneficiaries		Change rate of the population structure		Change rate of real GDP per capita		Change rate from laws and regulations		SGR	
Researcher	NHIC	Provider	NHIC	Provider	NHIC	Provider	NHIC	Provider	NHIC	Provider	NHIC	Provider
2004	1.0180	1.018	1.0071	1.0057	1.0123	1.0123	1.0434	1.0449	1.0033	1.003	1.0864	1.0864
2005	1.0202	1.0202	1.0052	1.0004	1.0124	1.0124	1.0398	1.0357	1.0090	1.009	1.0893	1.0798
2006	1.0232	1.0237	1.0017	1.0004	1.0107	1.0107	1.0479	1.0505	1.0266	1.0266	1.1144	1.1162
2007	1.0153	1.0153	1.0088	1.0086	1.0200	1.0284	1.0463	1.0475	1.0174	1.0174	1.1120	1.1225
2008	1.0129	1.0129	0.9936	1.0031	1.0092	1.0284	1.0496	1.0446	1.0000	1	1.0660	1.0915
2009	0.9903	1.0173	1.0014	1.0041	1.0133	1.0225	1.0479	1.0475	1.0000	1.0147	1.0530	1.1101

〈Table 29〉 SGR of this study

Type	2004	2005	2006	2007	2008	2009	2010
General specialty hospital	1.0942	1.1082	1.1977	1.1441	1.0709	1.0828	1.0990
General hospital	1.0942	1.0889	1.1457	1.1369	1.0702	1.0808	1.0957
Hospital	1.0942	1.0953	1.1645	1.1805	1.0700	1.0803	1.1097
Clinic	1.0942	1.0789	1.1071	1.1137	1.0698	1.0795	1.0876
Dental clinic	1.0942	1.0789	1.0988	1.1045	1.0691	1.0773	1.0835
Oriental medicine clinic	1.0942	1.0789	1.1036	1.1106	1.0691	1.0916	1.0904
Pharmacy	1.0942	1.0789	1.0988	1.1043	1.0691	1.0773	1.0835
Midwifery clinic	1.0942	1.0789	1.0988	1.1043	1.0691	1.0773	1.0835

〈Table 30〉 Actual medical fee by year

(Unit: 1 million KRW)

Type	2004	2005	2006	2007	2008	2009
General specialty hospital	3,270,729	3,512,589	4,194,126	4,855,099	5,328,901	6,372,637
General hospital	3,156,677	3,487,909	4,116,763	4,844,470	5,324,204	5,727,597
Hospital	1,623,487	1,881,706	2,391,180	3,202,717	3,916,478	4,818,928
Clinic	6,149,593	6,633,161	7,387,768	7,908,181	8,246,865	8,846,816
Dental clinic	991,339	1,027,483	1,072,280	1,109,362	1,142,308	1,216,983
Oriental medicine clinic	986,122	1,085,795	1,214,910	1,304,429	1,361,832	1,569,807
Pharmacy	6,195,767	7,033,331	8,035,769	8,885,087	9,561,027	10,557,852
Midwifery clinic	237,566	266,201	287,496	346,461	547,317	463,139

□ The 2009 actual medical fee was calculated by applying the full year ratio of 2008 to medical practice performances of 1H 2009.

〈Table 31〉 Target medical fee by year

(Unit: 1 million KRW)

Type	2004	2005	2006	2007	2008	2009	2010
General specialty hospital	3,270,729	3,624,730	4,206,941	4,798,517	5,199,407	5,769,967	7,003,297
General hospital	3,156,677	3,437,371	3,996,107	4,680,454	5,184,462	5,754,434	6,275,786
Hospital	1,623,487	1,778,184	2,191,231	2,822,902	3,427,007	4,230,826	5,347,773
Clinic	6,149,593	6,634,718	7,343,808	8,228,013	8,460,155	8,902,759	9,621,522
Dental clinic	991,339	1,069,543	1,128,983	1,184,288	1,185,965	1,230,613	1,318,644
Oriental medicine clinic	986,122	1,063,915	1,198,304	1,349,331	1,394,500	1,486,600	1,711,650
Pharmacy	6,195,767	6,684,534	7,728,116	8,874,282	9,498,608	10,300,134	11,439,426
Midwifery clinic	237,566	256,307	292,498	317,496	370,385	589,627	501,811

〈Table 32〉 2004-2009 target medical fee

(Unit: 1 million KRW)

Type	2004-2009 target medical fee
General specialty hospital	5,759,326
General hospital	5,178,880
Hospital	2,825,677
Clinic	9,448,054
Dental clinic	1,494,846
Oriental medicine clinic	1,521,841
Pharmacy	9,341,705
Midwifery clinic	358,192

〈Table 33〉 PAF, MEI, Conversion Factor update

	PAF	MEI	Conversion factor update	Small scale classification update	Medium scale classification update
General specialty hospital	0.90017	1.02395	0.92173	-7.83%	-8.59%
General hospital	0.97466	1.02394	0.99799	-0.20%	
Hospital	0.78547	1.02399	0.80431	-19.57%	
Clinic	1.02536	1.02210	1.04803	4.80%	4.80%
Dental clinic	1.07794	1.02297	1.10270	10.27%	10.27%
Oriental medicine clinic	0.95100	1.02297	0.97285	-2.72%	-2.72%
Pharmacy	0.94661	1.02053	0.96604	-3.40%	-3.40%
Midwifery clinic	1.13258	1.02198	1.16079	16.08%	16.08%

3. Cost analysis and financial performance analysis model

A. Study method for 2010 financial performance analysis-based conversion factor

□ Cost-based conversion factor calculation either utilizes publicly announced objective cost data or detailed cost data from existing studies. Both methods have issues with appropriateness of data and limitations to the study method.

- It is difficult to accurately calculate the uncovered practice costs matching health insurance uncovered Practice revenues using the cost data collected at present.
  - Cost-based conversion factor is used by many companies and is also scientifically validated. In case of hospitals or clinics, however, it is almost impossible to create the data for cost-based conversion factor and the results based on various assumptions are meaningless as a conversion factor.
  - In Korea, even the hospitals adopting the ABC cost system cannot precisely classify covered and uncovered practice costs.
- While the providers prefer cost-based conversion factor method for the outcome being high, it was judged much practical to use just the financial performance analysis considering that cost shifting of uncovered items are accepted. Thus, the conversion factor has been calculated based on the financial performance analysis.

□ In the 2010 conversion factor study, the costs were

identified based on the data of the year when the public announcement was made and the MEI applied to calculate the 2009 financial performance-based conversion factor.

□ The 2009 conversion factor outcome was applied for 2010 because estimating the conversion factor for 2010 using the 2009 value may increase the possibility of estimate errors.

□ Base year by reference data type

Data	2007	2008	2009 1H
Health insurance medical fee	○	○	○
Medical benefit medical fee	○	○	○
Survey on the actual out-of-pocket payment condition	○		
Statistics Korea's survey on the service industry	○		
MEI	○	○	○
Hospital business analysis	○		
National Tax Service financial data	○		

1) Calculation of medical revenues

□ Medical revenue calculation by year

○ 2007 revenue calculation

– Based on the health insurance benefit revenue (including practice and materials revenues) by medical institution type, the uncovered revenue was calculated by applying the uncovered out-of-pocket payment ratio presented in the 2007 survey on the out-of-pocket payment status. For medical benefit, NHIC data was utilized and the uncovered ratio of the survey on the out-of-pocket payment status was applied to calculate the revenue.

○ 2009 revenue calculation

- The 2009 annual benefit revenues were estimated based on 1H 2008revenue share compared to the total revenues and the total medical revenues were calculated by applying the 2007 survey on the out-of-pocket payment status to uncovered revenues.
  - The revenue estimation method using NHIC data has a drawback of being able to identify only the revenues related to health insurance and medical benefit patients.
  - While the method may be appropriate for medical institutions with high proportion of health insurance patients, the revenue of institutions with high proportion of uncovered patients as dental and oriental medicine clinics may be underestimated.

□ Evaluation of appropriateness based on hospital business analysis data

○ The evaluation of appropriateness by comparing revenue per patient from the health insurance medical fee and out-of-pocket payment survey and from the 2007 hospital business analysis data showed that there is some deviation between the revenue of the hospital business analysis data calculated based on the data submitted by medical institutions and the revenue calculated based on NHIC data.

○ The deviation was especially large in case of hospitals, which seems to be from the high proportion of patients that are not covered by health insurance.

〈Table 34〉 2007 revenue comparison (NHIC data VS Hospital business analysis data)

(Unit: 1 million KRW)

Classification	Outpatient		Inpatient	
	NHIC data	Hospital business analysis data	NHIC data	Hospital business analysis data
General specialty hospital	95,815	83,638	381,686	389,703
General hospital	52,544	48,120	204,584	229,696
Hospital	28,909	36,527	127,285	256,466
Dental hospital	45,717	50,462		
Oriental medicine hospital	37,368	34,359	104,013	74,415

※ The data of institutions above hospital level in the Hospital business analysis (KHIDI) sourcebook is very useful considering the number of hospitals analyzed and the diversity of data. Despite such advantages, the appropriateness of data is doubtful and requires consistent complementation going further.

Classification	General specialty hospital	Above 300 beds	160-299 beds	Below 160 beds	Hospital	Oriental medicine hospital	Dental hospital
Number of institutions	43	105	102	37	136	19	9
Number of beds by institution	842	495	235	177	122	70	4
Outpatient revenue (1,000 KRW)	7,188,633	4,170,277	2,342,030	2,290,407	1,749,490	2,320,633	44,389,510
Inpatient revenue (1,000 KRW)	13,021,194	7,069,575	4,158,364	4,169,571	3,142,189	2,589,846	2,796,183
Daily average number of outpatients	300.9	240.1	223.1	285.9	241.1	184.9	

Classification	General specialty hospital	Above 300 beds	160-299 beds	Below 160 beds	Hospital	Oriental medicine hospital	Dental hospital
Daily average number of inpatients	92.8	88	88.1	85.5	79	68.8	
Average outpatient costs (KRW)	87,604	60,753	44,815	40,556	39,314	44,038	72,818
Average inpatient costs (KRW)	392,463	220,366	153,174	150,480	132,489	95,303	816,119

○ The above table exhibits the number of patients and revenues by institution type, based on the Hospital business analysis sourcebook.

○ From the above table, the number of outpatient treatment days can be estimated as follows:

Classification	General specialty hospital	Above 300 beds	160-299 beds	Below 160 beds	Hospital	Oriental medicine hospital	Dental hospital
Estimation of the number of outpatient treatment days	273	286	234	198	185	285	109

○ The number of outpatient treatment days is calculated differently according to institution type.

○ This means that the data of each institution type is not sufficiently appropriate. In order to improve the utilization of the hospital business analysis data, the appropriateness should be improved.

○ In this study, revenues of general specialty hospital and general hospital were similar to the estimates using NHIC data and the appropriateness was verified through each validation process. Thus, the Hospital business analysis data has been utilized for the two

types of institution.

□ Evaluation of appropriateness based on the Service Industry Census

○ Number of patients by institution based on the analysis of the Service Industry Census were similar to the data analyzed based on the health insurance benefit data.

- In the case of number of institutions by type, number of all types except dental hospitals were close to the number of institutions identified by NHIC.

○ This indicates that for institutions regarded to raise high revenues in general medical practices as dental and oriental medicine clinics, it may be meaningful to compensate the general medical practice income, other than revenues identifiable in the health insurance benefit data, using the Service Industry Census.

〈Table 35〉 2007 revenue comparison (NHIC data VS Service Industry Census)

(Unit:1,000 KRW)

Classification		General specialty hospital	General hospital	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic
Health insurance benefit data	Number of institutions (A)	43	265	1,641	26,145	153	13,340	142	10,863
	Total revenue by institution (B)	167,695,276	25,994,701	4,638,997	363,466	1,018,068	134,149	1,312,799	133,345
	NHIC revenue	126,491,600	21,659,477	3,773,385	330,200	389,540	82,705	829,108	116,876
	NHIC service	82,542,200	15,544,033	3,038,392	307,705	372,228	79,784	817,601	115,281
	NHIC materials	43,949,400	6,115,444	734,993	22,495	17,311	2,921	11,507	1,594
	Uncovered revenue	41,203,676	4,335,224	865,612	33,266	628,528	51,443	483,691	16,469
Service Industry Census	Number of institutions (C)	369		1,334	24,872	17	12,994	117	10,527
	Total revenue (D)	47,882,138		4,159,831	400,097	8,548,000	367,894	2,988,923	233,750
Difference in the number of institutions (A-C)		-61		307	1,273	136	346	25	336
Difference in the revenue by institution (B-D)		-2,104,565		479,166	-36,631	-7,529,932	-233,746	-1,676,124	-100,405
Compared to the health insurance(B/D)		104.6%		89.7%	110.1%	839.6%	274.2%	227.7%	175.3%

2) Medical fee calculation

□ As mentioned earlier, the total costs of medical institution by type were estimated using macro indices, not directly investigating the actual financial performance of the institution, for the 2010 financial performance-based conversion factor calculation.

□ The data used for estimating the total costs of medical

institutions by type include the financial statements of corporate hospitals from National Tax Service (NTS) Statistics Yearbook, cost-related data by institution type from Statistics Korea's Service Industry Census data and National Tax Service's simple and standard expense rate data by industry type.

- Unlike existing studies where one type of data is applied across all the institutions, the principle of this study is to apply the most reasonable data to each type of institution, identified from various base data of each institution.
- Moreover, the study will present the pros and cons of each index by calculating the resulting values through analyses that are applied with various cost-related indices.

○ Scope of application by reference data

Data	General specialty hospital	General hospital	Hospital	Dental hospital	Oriental medicine hospital	Clinic	Dental clinic	Oriental medicine clinic	Pharmacy
Health insurance practice fee	○	○	○	○	○	○	○	○	○
Medical benefit practice fee	○	○	○	○	○	○	○	○	○
Statistics Korea Service Industry Census		○	○	○	○	○	○	○	
MEI	○	○	○	○	○	○	○	○	○
Hospital business analysis	○	○	○	○	○				
NTS financial data		○							

〈Table 36〉 NTS simple and standard expense rate data (as of 2007)

Code number	Type		Scope and rules of application	Simple expense rate	Standard expense rate
	Level-4 classification	Level-5 classification			
851101	Hospital	• General hospital • Ambulatory hospital • Nursing home	○Including consultancy fees, allowances or other rewards of similar nature	78.3	27.2
851102		• Dental hospital	○Including consultancy fees, allowances or other rewards of similar nature	63.6	22.6
851103		• Oriental medicine hospital	○Including consultancy fees, allowances or other rewards of similar nature	67.5	23.4
851201	Doctor	• General division • Internal medicine • Pediatrics	○Including consultancy fees, allowances or other rewards of similar nature	70.5	26.6
851202		• General surgery • Ortheopedics	○Including proctology and neurosurgery ○Including consultancy fees, allowances or other rewards of similar nature	74.8	27.5
851203		• Neurology • Psychiatry	○Including neuropsychiatry ○Including consultancy fees, allowances or other rewards of similar nature	73.9	28.4
851204		• Dermatology • Urology	○Including consultancy fees, allowances or other rewards of similar nature	68.3	25.9
851205		• Ophthalmology	○Including consultancy fees, allowances or other rewards of similar nature	69.5	28.7
851206		• Otorhinolaryngology	○Including consultancy fees, allowances or other rewards of similar nature	73.1	31.0
851207		• Obstetrics and Gynecology	○Including consultancy fees, allowances or other rewards of similar nature	65.0	21.7
851208		• Radiology	○Including consultancy fees, allowances or other rewards of similar nature	71.1	29.1
851209		• Plastic surgery	○Including consultancy fees, allowances or other rewards of similar nature	42.7	16.1
851211		• Dental clinic	○Including consultancy fees, allowances or other rewards of similar nature	61.7	17.2
851212		• Oriental medicine clinic	○Including consultancy fees, allowances or other rewards of similar nature	56.6	18.9
851219		• Other clinic	○Other clinic • Other departments not separately classified, such as the anesthesiology unit, tuberculosis department, family medicine, rehabilitation department. ○Including consultancy fees, allowances or other rewards of similar nature	70.2	28.2
851901		• Midwifery clinic	○Midwifery clinic(including independent nurses) ○Including consultancy fees, allowances or other rewards of similar nature	70.3	28.2

〈Table 37〉 Statistics Korea Service Industry Census (2007)

(Unit: 1,000 KRW, KRW)

Classification	Number of businesses	Number of staff	Sales volume	Business expenses	Labor costs
General hospital	369	184,754	17,668,509	17,139,717	7,766,989
Ambulatory hospital	1,334	84,368	5,549,215	5,021,365	2,303,232
Dental hospital	17	1,883	145,316	129,809	69,881
Oriental medicine hospital	117	5,097	349,704	318,935	159,839
General clinic	24,872	149,076	9,951,205	7,334,153	2,623,829
Dental clinic	12,994	62,695	4,780,419	3,176,682	980,686
Oriental medicine clinic	10,527	38,608	2,460,687	1,602,207	450,164
Radiographic diagnosis, Pathology	427	7,697	727,166	600,528	246,543
Classification	Rent	Water, light and heat expenses	Other expenses	Annual benefit	Size (m^2)
General hospital	103,818	273,123	8,995,788	6,674,305	8,737,563
Ambulatory hospital	77,111	141,894	2,499,128	2,082,024	4,785,166
Dental hospital	2,011	1,849	56,068	60,800	78,541
Oriental medicine hospital	6,294	9,396	143,406	144,154	339,602
General clinic	528,844	222,293	3,959,187	2,338,854	7,154,033
Dental clinic	220,203	68,842	1,906,952	912,905	2,175,471
Oriental medicine clinic	141,587	49,275	961,180	414,117	1,743,740
Radiographic diagnosis, Pathology	39,993	7,701	306,291	211,438	247,354

〈Table 38〉 Proportion of costs by accounts of medical institutions above hospital level (Hospital business analysis, 2007)

Classification	General specialty hospital	General hospital	Hospital	Oriental medicine hospital	Dental hospital
Medical expense total	100.0%	100.0%	100.0%	100.0%	100.0%
- Labor costs total	48.4%	48.2%	43.7%	52.1%	57.0%
. Doctorship	13.4%	17.5%	14.3%	13.6%	35.7%
(Medical specialist wage)	8.2%	16.2%	14.1%	6.1%	21.4%
. Nursing	15.5%	12.1%	11.8%	15.1%	2.8%
. Pharmacist	0.5%	0.6%	0.5%	0.4%	0.2%
. Medical technician	4.1%	3.9%	3.6%	3.6%	8.4%
. Clerical worker	4.3%	4.7%	7.1%	12.6%	4.4%
. Technical worker and other	8.7%	6.2%	4.3%	4.8%	3.8%
. reserve for retirement allowances	1.8%	3.2%	2.1%	2.0%	1.8%
- Materials costs total	33.0%	28.2%	25.3%	15.8%	19.3%
. Drug costs	18.6%	13.0%	13.0%	9.8%	2.1%
. Hospital material	12.5%	9.2%	7.1%	2.2%	16.7%
. Meal materials	1.1%	2.0%	3.8%	3.7%	
. Other hospital materials	0.7%	3.9%	1.5%	0.2%	0.5%
- Maintenance costs total	18.7%	23.7%	30.9%	32.1%	23.7%

3) 2010 financial performance-based conversion factor calculation

□ For the 2009 cost estimates, the medical expense increase rate was calculated considering variables as the inflation rate and the changes in medical use volume based on the 2007 cost data.

□ The same MEI growth rate used in the index model and the SGR model was applied to the financial performance analysis as well.

□ Revenue estimation

– The total revenue of each institution is estimated

using health insurance benefit details, by dividing the total health insurance benefit revenue by the number of institutions and reflecting the uncovered out-of-pocket payment rate from the Out-of-pocket payment status survey.

〈Table 39〉 Estimation of revenues by institution

□ 2007 revenue

(Unit: 1,000 KRW)

Classification	Number of institutions	Revenue by institution	Health insurance revenue	Health insurance practice revenue	Health insurance materials revenue	Uncovered revenue
General specialty hospital	43	167,695,276	126,491,600	82,542,200	43,949,400	41,203,676
General hospital	265	25,994,701	21,659,477	15,544,033	6,115,444	4,335,224
Hospital	1,049	4,046,979	3,190,172	2,522,063	668,108	856,807
Nursing home	592	1,641,051	1,616,644	1,431,241	185,403	24,406
Clinic	26,145	363,466	330,200	307,705	22,495	33,266
Dental hospital	153	1,018,068	389,540	372,228	17,311	628,528
Dental clinic	13,340	134,149	82,705	79,784	2,921	51,443
Oriental medicine hospital	142	1,312,799	829,108	817,601	11,507	483,691
Oriental medicine clinic	10,863	133,345	116,876	115,281	1,594	16,469
Pharmacy	20,730	477,677	471,768	121,636	350,132	5,908

□ 2008 revenue

(Unit: 1,000 KRW)

Classification	Number of institutions	Revenue by institution	Health insurance revenue	Health insurance practice revenue	Health insurance materials revenue	Uncovered revenue
General specialty hospital	43	184,529,770	134,522,202	87,400,828	47,121,374	50,007,568
General hospital	268	28,979,852	23,125,922	16,602,333	6,523,588	5,853,930
Hospital	1,190	4,310,743	3,151,153	2,519,614	631,540	1,159,590
Nursing home	690	2,059,676	2,016,423	1,927,744	88,679	43,253
Clinic	26,521	381,189	337,352	313,922	23,429	43,837
Dental hospital	167	928,806	386,383	366,717	19,666	542,423
Dental clinic	13,719	129,637	81,283	78,654	2,628	48,355
Oriental medicine hospital	145	1,294,658	788,447	778,353	10,094	506,211
Oriental medicine clinic	11,321	127,950	117,330	115,881	1,450	10,620
Pharmacy	20,841	513,320	503,054	124,707	378,347	10,266

□ 2009 revenue

(Unit: 1,000 KRW)

Classification	Number of institutions	Revenue by institution	Health insurance revenue	Health insurance practice revenue	Health insurance materials revenue	Uncovered revenue
General specialty hospital	44	215,160,455	156,851,972	103,124,100	53,727,872	58,308,483
General hospital	269	31,171,546	24,874,894	17,953,570	6,921,323	6,296,652
Hospital	1,228	4,966,813	3,630,740	2,885,216	745,524	1,336,073
Nursing home	733	2,573,108	2,519,073	2,201,703	317,369	54,035
Clinic	26,827	399,705	353,739	328,302	25,438	45,966
Dental hospital	175	1,030,505	428,690	409,490	19,200	601,815
Dental clinic	13,999	136,791	85,768	83,137	2,631	51,023
Oriental medicine hospital	144	1,451,494	883,960	873,314	10,646	567,534
Oriental medicine clinic	11,629	146,116	133,988	132,517	1,472	12,128
Pharmacy	20,913	554,280	543,194	133,528	409,666	11,086

□ Estimation of costs

– The total costs by type of medical institution is

estimated using publicly announced external data (NTS, Statistics Korea and others).

- The total costs of general specialty hospitals and general hospitals, mostly corporate hospitals, have been estimated using the 2007 NTS corporate hospital data. The costs of hospital level institutions including general specialty hospitals were estimated based on the 2007 hospital business analysis data.
- The total costs of general hospitals and medical institutions below hospital level were estimated using the Service Industry Census. The precedent studies used and analysed simple expense rate data announced by NTS. In the case of simple expense rate, the medical industry and lawyers have been excluded from application since 2008 and most of the medical institutions cannot be applied with the rate from raising revenues of 24 million KRW or less or not applicable for being opened for less than 6 months. Despite the fact that simple expense rate applied conversion factor study is inappropriate, it is still presented as reference data since precedent studies estimated the outcomes by applying the simple expense rate.
- Head doctors' labor costs were estimated using three methods and the outcome compared to apply the appropriate labor cost. The labor costs were first calculated based on the data collected through the actual 2004 sample study and applied with the labor costs increase rate thereafter. The labor costs were estimated again by extracting the monthly salary data, on which the health insurance premium was imposed

in 2008 and 2009. Then, the results were compared to the city workers monthly average wage data utilized as comparison data for labor costs in precedent studies.

• Estimation of labor costs using sample survey data

(Unit: KRW)

Classification		2004	2005	2006	2007	2008	2009
Increase rate			9.70%	8.94%	3.63%	1.83%	1.45%
Monthly average	Doctor	8,876,727	9,737,770	10,608,326	10,993,408	11,194,588	11,356,909
	Dentist	8,114,700	8,000,000	8,715,200	9,031,562	9,196,839	9,330,194
	Oriental doctor	7,435,800	8,500,000	9,259,900	9,596,034	9,771,642	9,913,331
	Pharmacist	4,768,000	4,650,000	5,065,710	5,249,595	5,345,663	5,423,175
Annual	Doctor	106,520,724	116,853,234	127,299,913	131,920,900	134,335,053	136,282,911
	Dentist	97,376,400	96,000,000	104,582,400	108,378,741	110,362,072	111,962,322
	Oriental doctor	89,229,600	102,000,000	111,118,800	115,152,412	117,259,702	118,959,967
	Pharmacist	57,216,000	55,800,000	60,788,520	62,995,143	64,147,954	65,078,100

• Estimation of labor costs using monthly salary used as criteria for imposing health insurance premium

(Unit: KRW)

Classification	2008		2009	
	Monthly salary per capita	Annual salary	Monthly salary per capita	Annual salary
General specialty hospital	4,394,675	52,736,095	4,375,717	52,508,602
General hospital	7,679,736	92,156,829	7,935,881	95,230,574
Hospital	10,619,202	127,430,421	11,051,377	132,616,518
clinic	8,556,900	102,682,803	8,499,693	101,996,314
Dental hospital	6,397,443	76,769,311	6,813,464	81,761,572
Dental clinic	6,591,628	79,099,539	6,623,046	79,476,554
Oriental medicine hospital	5,341,532	64,098,385	5,420,579	65,046,951
Oriental medicine clinic	5,163,315	61,959,782	4,843,956	58,127,471
Pharmacy	3,591,220	43,094,640	3,591,149	43,093,784

• Comparison with the monthly average wage of city worker household (2008)

(Unit: KRW)

Classification	Annual wage of city workers	Ratio	Annual salary
Doctors	46,733,505	3.5	163,567,268
Pharmacists		1.5	70,100,258

• The labor costs of city workers and doctors estimated by applying the wage increase rate until 2008 to the monthly average wage of city worker household and the 2004 actual survey on doctors' labor costs, respectively, showed that the doctors' labor costs in 2008 were 2.73 times higher than the city workers' average wage, the ratio decreasing compared to the past.

• In the case of materials costs, revenue of compensatory materials was recognized as compensatory materials costs while non-compensatory materials costs were considered to be included in the practice costs and not calculated separately.

– The base year for the costs was assumed as 2007. The costs up to 2009 were estimated using MEI and compensatory materials costs identifiable in the health insurance benefit revenues. The estimated head doctors' labor costs were recognized as direct costs and were calculated separately.

– The MEI data referred to in the index and the SGR models was also used in this method, provided that the MEI here has been applied with the changes in the volume of medical use.

B. 2010 financial performance based conversion factor

□ Financial performance analysis based on KHIDI's business analysis data

– Status of the profit rate and costs by hospital (2007)

Classification	Medical profit rate	Labor costs	Materials costs	Maintenance costs
General specialty hospital	0.998	43.8%	34.8%	21.4%
General hospital	1.001	45.4%	29.1%	25.5%
Hospital	0.923	44.8%	30.0%	25.1%
Dental hospital	0.756	38.8%	34.1%	27.0%
Oriental medicine hospital	0.973	55.3%	16.0%	28.7%

(Unit:천원)

2007	General specialty hospital	General hospital	Hospital	Dental hospital	Oriental medicine hospital
Total revenue	167,695,276	25,994,701	4,046,978	1,018,068	1,312,799
Health insurance (including medical benefit)	167,695,276	25,994,701	4,046,978	1,018,068	1,312,799
- Practice revenue	82,542,200	15,544,033	2,522,063	372,228	817,601
- Materials revenue	43,949,400	6,115,444	668,108	17,311	11,507
- Uncovered revenue	41,203,676	4,335,224	856,807	628,528	483,691
Medical expenses	167,359,885	26,020,696	3,735,361	769,659	1,277,353
Labor costs	73,266,226	11,813,334	1,674,965	298,955	706,569
Materials costs	58,250,122	7,571,382	1,121,538	262,655	203,784
Compensatory materials costs	43,949,400	6,115,444	668,108	17,311	11,507
Non-compensatory materials costs	14,300,722	1,455,938	453,430	245,344	192,277
Maintenance costs	35,843,537	6,635,980	938,858	208,050	367,001
Medical profit	335,391	-25,995	311,617	248,409	35,446

2008	General specialty hospital	General hospital	Hospital	Dental hospital	Oriental medicine hospital
Total revenue	184,529,770	28,979,852	4,310,743	928,806	1,294,658
Health insurance (including medical benefit)	134,522,202	23,125,922	3,151,153	386,383	788,447
- Practice revenue	87,400,828	16,602,333	2,519,614	366,717	778,353
- Materials revenue	47,121,374	6,523,588	631,540	19,666	10,094
- Uncovered revenue	50,007,568	5,853,930	1,159,590	542,423	506,211
Applied MEI	1.12863	1.09012	1.10303	1.04194	1.02153
Compensatory materials costs	47,121,374	6,523,588	631,540	19,666	10,094
Medical expenses	186,406,151	28,222,702	4,014,811	803,568	1,303,194
Medical profit	-1,876,381	757,150	295,932	125,238	-8,536
2009	General specialty hospital	General hospital	Hospital	Dental hospital	Oriental medicine hospital
Total revenue	215,160,455	31,171,546	4,966,813	1,030,505	1,451,494
Health insurance (including medical benefit)	156,851,972	24,874,894	3,630,740	428,690	883,960
- Practice revenue	103,124,100	17,953,570	2,885,216	409,490	873,314
- Materials revenue	53,727,872	6,921,323	745,524	19,200	10,646
- Uncovered revenue	58,308,483	6,296,652	1,336,073	601,815	567,534
Applied MEI	1.10436	1.05080	1.08954	1.04972	1.08972
Compensatory materials costs	53,727,872	6,921,323	745,524	19,200	10,646
Medical expenses	207,548,407	29,722,752	4,431,734	842,077	1,419,763
Medical profit	7,612,047	1,448,794	535,079	188,428	31,731
Conversion factor update	-7.38%	-8.07%	-18.55%	-46.02%	-3.63%

□ Financial performance analysis using NTS' corporate hospital financial statements

(Unit: 1,000 KRW)

Classification	2007		2008		2009	
	General specialty hospital	General hospital	General specialty hospital	General hospital	General specialty hospital	General hospital
Total revenue	167,695,276	25,994,701	184,529,770	28,979,852	215,160,455	31,171,546
Health insurance (including medical benefit)	167,695,276	25,994,701	134,522,202	23,125,922	156,851,972	24,874,894
- Practice revenue	82,542,200	15,544,033	87,400,828	16,602,333	103,124,100	17,953,570
- Materials revenue	43,949,400	6,115,444	47,121,374	6,523,588	53,727,872	6,921,323
- Uncovered revenue	41,203,676	4,335,224	50,007,568	5,853,930	58,308,483	6,296,652
Medical cost ratio	97.5%	97.5%	98.7%	94.8%	94.2%	92.9%
Medical MEI			1.129	1.090	1.104	1.051
Compensatory materials costs	43,949,400	6,115,444	47,121,374	6,523,588	53,727,872	6,921,323
Medical expenses	163,502,894	25,344,834	182,053,035	27,485,931	202,741,000	28,948,553
Medical profit	4,192,382	649,868	2,476,735	1,493,921	12,419,455	2,222,993
Conversion factor update					-12.0%	-12.4%

□ Financial performance analysis using Statistics Korea's Service Industry Census data

– Estimation based only on the health insurance and medical benefit revenues

(Unit: 1,000 KRW)

2007	General specialty hospital	General hospital	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic
Total revenue	167,695,276	25,994,701	4,046,979	363,466	1,018,068	134,149	1,312,799	133,345
Health insurance	126,491,600	21,659,477	3,190,172	330,200	389,540	82,705	829,108	116,876
- Practice revenue	82,542,200	15,544,033	2,522,063	307,705	372,228	79,784	817,601	115,281
- Materials revenue	43,949,400	6,115,444	668,108	22,495	17,311	2,921	11,507	1,594
- Uncovered revenue	41,203,676	4,335,224	856,807	33,266	628,528	51,443	483,691	16,469
Medical cost ratio	97.0%	97.0%	90.5%	74.3%	89.3%	66.5%	91.2%	65.1%
Compensatory materials costs	43,949,400	6,115,444	668,108	22,495	17,311	2,921	11,507	1,594
Head doctors' labor costs			131,921	131,921	108,379	108,379	115,152	115,152
Medical expenses	162,676,408	25,216,718	3,793,945	401,998	1,017,806	197,523	1,312,444	201,976
Medical profit	5,018,868	777,982	253,034	-38,532	262	63,375	355	-68,631
2008	General specialty hospital	General hospital	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic
Total revenue	184,529,770	28,979,852	4,310,743	381,189	928,806	129,637	1,294,658	127,950
Health insurance	134,522,202	23,125,922	3,151,153	337,352	386,383	81,283	788,447	117,330
- Practice revenue	87,400,828	16,602,333	2,519,614	313,922	366,717	78,654	778,353	115,881
- Materials revenue	47,121,374	6,523,588	631,540	23,429	19,666	2,628	10,094	1,450
- Uncovered revenue	50,007,568	5,853,930	1,159,590	43,837	542,423	48,355	506,211	10,620
MEI	1.12863	1.09012	1.10303	1.03421	1.04194	1.02402	1.02153	1.02544
Compensatory materials costs	47,121,374	6,523,588	631,540	23,429	19,666	2,628	10,094	1,450
Head doctors' labor costs			134,335	134,335	110,362	110,362	117,260	117,260
Medical expenses	181,120,237	27,346,270	4,068,253	413,816	1,059,560	201,285	1,338,668	206,107
Medical profit	3,409,533	1,633,582	242,490	-32,628	-130,754	71,648	-44,010	-78,157

2009	General specialty hospital	General hospital	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic
Total revenue	215,160,455	31,171,546	4,966,813	399,705	1,030,505	136,791	1,451,494	146,116
Health insurance	156,851,972	24,874,894	3,630,740	353,739	428,690	85,768	883,960	133,988
- Practice revenue	103,124,100	17,953,570	2,885,216	328,302	409,490	83,137	873,314	132,517
- Materials revenue	53,727,872	6,921,323	745,524	25,438	19,200	2,631	10,646	1,472
- Uncovered revenue	58,308,483	6,296,652	1,336,073	45,966	601,815	51,023	567,534	12,128
MEI	1.10436	1.0508	1.08954	1.03791	1.04972	1.0283	1.08972	1.04547
Compensatory materials costs	53,727,872	6,921,323	745,524	25,438	19,200	2,631	10,646	1,472
Head doctors' labor costs			136,283	136,283	111,962	111,962	118,960	118,960
Medical expenses	201,710,856	28,735,460	4,432,525	429,504	1,112,241	206,981	1,458,774	215,479
Medical profit	13,449,599	2,436,086	534,288	-29,799	-81,736	-70,190	-7,280	-69,362
Conversion factor update	-13.04%	-13.57%	-18.52%	9.08%	19.96%	84.43%	0.83%	52.34%

– Reflecting revenues from other than health insurance and medical benefits

(Unit: 1,000 KRW)

2009	Clinic	Dental clinic	Oriental medicine hospital	Oriental medicine clinic
Total revenue	439,989	375,142	3,304,697	256,138
Health insurance(including medical benefits)	399,705	136,791	1,451,494	146,116
- Practice revenue	328,302	83,137	873,314	132,517
- Materials revenue	25,438	2,631	10,646	1,472
- Uncovered revenue	45,966	51,023	567,534	12,128
Other types	40,283	238,350	1,853,203	110,022
MEI	1.04	1.03	1.09	1.05
Compensatory materials costs	25,438	2,631	10,646	1,472
Head doctors' labor costs	136,283	111,962	118,960	118,960
Medical expenses	454,099	368,947	3,151,264	281,891
Medical profit	-14,110	6,194	153,434	- 25,753
Conversion factor update	4.30%	-7.45%	-17.57%	19.43%

– Reflecting revenues from other than health insurance (including medical benefits) and monthly salary used as the criteria for imposing NHIC insurance premium

(Unit: 1,000 KRW)

2009	Clinic	Dental clinic	Oriental medicine hospital	Oriental medicine clinic
Total revenue	439,989	375,142	3,304,697	256,138
Health insurance (including medical benefits)	399,705	136,791	1,451,494	146,116
- Practice revenue	328,302	83,137	873,314	132,517
- Materials revenue	25,438	2,631	10,646	1,472
- Uncovered revenue	45,966	51,023	567,534	12,128
Other types	40,283	238,350	1,853,203	110,022
MEI	1.04	1.03	1.09	1.05
Compensatory materials costs	25,438	2,631	10,646	1,472
Head doctors' labor costs	104,172	80,246	65,028	62,858
Medical expenses	421,988	337,231	3,097,331	225,789
Medical profit	18,001	37,910	207,366	30,349
Conversion factor update	- 5.48%	-45.60%	-23.74%	-22.90%

□ Financial performance analysis using NTS' simple expense rate

○ Comparison with the revenues from health insurance and medical benefits

(Unit: 1,000 KRW)

2007	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic	Pharmacy
Total revenue	4,046,979	363,466	1,018,068	134,149	1,312,799	133,345	477,677
Health insurance(including medical benefits)	3,190,172	330,200	389,540	82,705	829,108	116,876	471,768
- Practice revenue	2,522,063	307,705	372,228	79,784	817,601	115,281	121,636
- Materials revenue	668,108	22,495	17,311	2,921	11,507	1,594	350,132
- Uncovered revenue	856,807	33,266	628,528	51,443	483,691	16,469	5,908
Simple expense rate	78.3%	69.9%	63.6%	61.7%	67.5%	56.6%	83.5%
Simple expense	3,168,784	254,063	647,491	82,770	886,139	75,473	398,860
Materials costs	668,108	22,495	17,311	2,921	11,507	1,594	350,132
Simple expense excluding materials	2,500,676	231,568	630,180	79,849	874,633	73,879	48,728
Head doctors' labor costs	131,921	131,921	108,379	108,379	115,152	115,152	62,995
Total costs	3,300,705	385,983	755,870	191,148	1,001,292	190,626	461,855
Medical profit	746,274	-22,518	262,198	-57,000	311,507	-57,281	15,821

2008	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic	Pharmacy
Total revenue	4,310,743	381,189	928,806	129,637	1,294,658	127,950	513,320
Health insurance (including medical benefits)	3,151,153	337,352	386,383	81,283	788,447	117,330	503,054
- Practice revenue	2,519,614	313,922	366,717	78,654	778,353	115,881	124,707
- Materials revenue	631,540	23,429	19,666	2,628	10,094	1,450	378,347
- Uncovered revenue	1,159,590	43,837	542,423	48,355	506,211	10,620	10,266
MEI	1.10303	1.03421	1.04194	1.02402	1.02153	1.02544	1.02672
Applied simple expense	68.2%	65.9%	64.5%	61.0%	68.1%	56.8%	10.5%
Simple expense	2,758,321	239,489	656,610	81,767	893,464	75,758	50,030
Materials costs	631,540	23,429	19,666	2,628	10,094	1,450	378,347
Head doctors' labor costs	134,335	134,335	110,362	110,362	117,260	117,260	64,148
Medical expenses	3,524,196	397,254	786,638	194,757	1,020,817	194,468	492,524
Medical profit	786,548	-16,065	142,168	-65,120	273,841	-66,517	20,796
2009	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic	Pharmacy
Total revenue	4,966,813	399,705	1,030,505	136,791	1,451,494	146,116	554,280
Health insurance (including medical benefits)	3,630,740	353,739	428,690	85,768	883,960	133,988	543,194
- Practice revenue	2,885,216	328,302	409,490	83,137	873,314	132,517	133,528
- Materials revenue	745,524	25,438	19,200	2,631	10,646	1,472	409,666
- Uncovered revenue	1,336,073	45,966	601,815	51,023	567,534	12,128	11,086
MEI	1.08954	1.03791	1.04972	1.0283	1.08972	1.04547	1
Applied simple expense rate	74.3%	68.4%	67.7%	62.7%	74.2%	59.4%	10.7%
Simple expense	3,005,301	248,568	689,256	84,081	973,625	79,203	51,000
Materials costs	745,524	25,438	19,200	2,631	10,646	1,472	409,666
Head doctors' labor costs	136,283	136,283	111,962	111,962	118,960	118,960	65,078
Medical expenses	3,887,108	410,289	820,418	198,674	1,103,231	199,635	525,744
Medical profit	1,079,705	-10,584	210,087	-61,882	348,263	-53,519	28,536
Conversion factor update	-37.42%	3.22%	-51.30%	74.43%	-39.88%	40.39%	-21.37%

○ Including revenues from other than health insurance and medical benefits

2007	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic	Pharmacy
Total revenue	4,046,979	400,097	1,018,068	367,894	2,988,923	233,750	477,677
Health insurance (including medical benefits)	3,190,172	330,200	389,540	82,705	829,108	116,876	471,768
- Practice revenue	2,522,063	307,705	372,228	79,784	817,601	115,281	121,636
- Materials revenue	668,108	22,495	17,311	2,921	11,507	1,594	350,132
- Uncovered revenue	856,807	69,897	628,528	285,189	2,159,815	116,874	5,908
Simple expense rate	78.3%	69.9%	63.6%	61.7%	67.5%	56.6%	83.5%
Materials costs	668,108	22,495	17,311	2,921	11,507	1,594	350,132
Simple expense excluding materials	2,500,676	257,173	630,180	224,070	2,006,017	130,708	48,728
Head doctors' labor costs	131,921	131,921	108,379	108,379	115,152	115,152	62,995
Total costs	3,300,705	411,588	755,870	335,370	2,132,675	247,455	461,855
Medical profit	746,274	-11,492	262,198	32,525	856,248	-13,705	15,821
2008	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic	Pharmacy
Total revenue	4,310,743	419,606	928,806	355,522	2,947,620	224,294	513,320
Health insurance (including medical benefits)	3,151,153	337,352	386,383	81,283	788,447	117,330	503,054
- Practice revenue	2,519,614	313,922	366,717	78,654	778,353	115,881	124,707
- Materials revenue	631,540	23,429	19,666	2,628	10,094	1,450	378,347
- Uncovered revenue	1,159,590	82,254	542,423	274,240	2,159,173	106,963	10,266
MEI	1.10303	1.03421	1.04194	1.02402	1.02153	1.02544	1.02672
Applied simple expense rate	68.2%	66.5%	64.5%	62.4%	68.6%	57.3%	10.5%
Simple expense	2,758,321	265,970	656,610	229,452	2,049,206	134,033	50,030
Materials costs	631,540	23,429	19,666	2,628	10,094	1,450	378,347
Head doctors' labor costs	134,335	134,335	110,362	110,362	117,260	117,260	64,148
Medical expenses	3,524,196	423,735	786,638	342,442	2,176,560	252,743	492,524
Medical profit	786,548	-4,129	142,168	13,080	771,060	-28,449	20,796

2009	Hospital	Clinic	Dental hospital	Dental clinic	Oriental medicine hospital	Oriental medicine clinic	Pharmacy
Total revenue	4,966,813	439,989	1,030,505	375,142	3,304,697	256,138	554,280
Health insurance (including medical benefits)	3,630,740	353,739	428,690	85,768	883,960	133,988	543,194
- Practice revenue	2,885,216	328,302	409,490	83,137	873,314	132,517	133,528
- Materials revenue	745,524	25,438	19,200	2,631	10,646	1,472	409,666
- Uncovered revenue	1,336,073	86,249	601,815	289,373	2,420,737	122,149	11,086
MEI	1.08954	1.03791	1.04972	1.0283	1.08972	1.04547	1.01939
Applied simple expense rate	74.3%	69.0%	67.7%	64.1%	74.7%	59.9%	10.7%
Simple expense	3,005,301	276,053	689,256	235,946	2,233,061	140,128	51,000
Materials costs	745,524	25,438	19,200	2,631	10,646	1,472	409,666
Head doctors' labor costs	136,283	136,283	111,962	111,962	118,960	118,960	65,078
Medical expenses	3,887,108	437,774	820,418	350,538	2,362,667	260,560	525,744
Medical profit	1,079,705	2,215	210,087	24,603	942,030	-4,422	28,536
Conversion factor update	-37.42%	-0.67%	-51.30%	-29.59%	-107.87%	3.34%	-21.37%

□ Financial performance analysis based conversion factor outcome

- The gap of the conversion factor may be large depending on the method for estimating the conversion factor determining year from the base year.
- In the case of medical institutions below hospital level, the conversion factor varies largely according to how the head doctor's labor costs are estimated. There are controversies on whether to use the estimation based on the actually surveyed value, the monthly salary used for imposing NHIC insurance

premium or to apply the city workers' average wage. There is no discussion on the appropriate labor cost even at present.

- In this study, it has been considered most appropriate to estimate the labor costs by applying the wage increase rate to the actually measured data of 2004 within threefold scope of the city workers' average wage. In the case of oriental doctors, there may be disputes on appropriate labor costs if the decreasing trend of their labor costs is reflected to estimate the conversion factor.
  - Therefore, while the labor costs refer to the actual labor costs, it is necessary to set an appropriate level of labor costs accepted by social norms. The limit for such level has been considered to be three times higher than the city workers' average wage since the average doctors' labor costs of OECD countries are also between 2.5 to 3 times higher than city workers'.
- According to the study on financial performance-based conversion factor in the macro economic view regarding all types of medical institutions, the revenue size of general specialty hospitals and general hospitals was similar to the hospital business analysis data. Thus, it is considered appropriate to apply the profit ratio of the business analysis data.
  - In the case of medical institutions below hospital level, the Service Industry Census data was found to be appropriate as the macro index since the evaluation of appropriateness showed that over

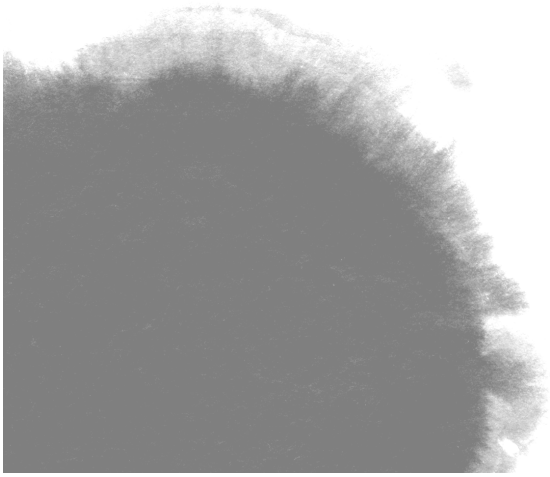
90% of the data is based on the concerned medical institutions' status and is sufficiently objective.

- The revenues of dental and oriental medicine clinics estimated only from the health insurance revenues are not appropriate, and thus, were adjusted using revenue by institution from the Service Industry Census data to improve the appropriateness of the study.
- The conversion factor of pharmacies was calculated based on the simple expense rate of the publicly announced data because the base data for estimating other costs was insufficient.
- 2009 conversion factor update based on financial performance analysis

Type of medical institution	Conversion factor update	Remarks
General specialty hospital	-7.4%	Hospital business analysis data
General hospital	-8.1%	Hospital business analysis data
Hospital	-16.9%	Service Industry Census data
Clinic	4.9%	Service Industry Census data and revenue adjustment
Dental clinic	-5.5%	Service Industry Census data and revenue adjustment
Oriental medicine hospital	-16.5%	Service Industry Census data and revenue adjustment
Oriental medicine clinic Pharmacy	22.2%	Service Industry Census data and revenue adjustment

04

Conclusion and Policy Recommendations



CHAPTER 4
Conclusion and Policy Recommendations

□ Since the conversion factor-based fee contract system was adopted in 2001, many studies were carried out to calculate the reasonable conversion factor, on which the insurers or the providers base the negotiation of the fee level every year.

□ In the initial stages of the system, efforts were made to compensate the costs by investigating the cost data of hospitals and clinics or to identify the level where the financial performance is balanced.

- For the purpose, vast data including accounting and costs data of hospitals and clinics were collected and required values estimated using cost or financial performance analysis methods applied to general companies.
- However, agreements could not be reached on whether the conversion factor should be at the level compensating the costs matching the health insurance benefit practice or the costs against revenues including uncovered revenues.
- The disputes continued from being favorable or unfavorable to interested parties depending on whether cost analysis or financial performance

analysis is used.

□ In order to overcome these limitations, it was necessary to identify a cost-effective method agreeable among the parties using macro indices and not cost or financial performance analysis.

- The alternative method developed was the SGR model-based conversion factor, followed by study methods using macro indices as the index model.
- These methods, however, also had issues with objectivity, appropriateness of the fee level or data reliability, which were limitations for reaching an agreement on the fee level.

□ Various methodologies suggested by many researchers lead to a wide variety of calculation methods and outcome, leading only to amplified debates on the appropriate conversion factor.

- There are a lot of difficulties in identifying a conversion factor that is acceptable for the insurers, providers and the health insurance subscribers paying the insurance premium.

□ The purpose of this study was to identify study methods based on reliable data that is acceptable by contract parties and to calculate the conversion factor for 2010.

- The study reviewed methodologies used in NHIC or providers' studies and verified data reliability.
- Based on the review, the conversion factor was calculated using existing methods, specifically the SGR model, index model and the financial performance analysis method.
- The basic calculation method used was to apply the

method used in NHIC study using the data considered most reasonable by the researchers of this study.

□ For calculating the conversion factor for 2010, the study aimed to exclude external environmental elements that may be favorable/unfavorable to interested parties to identify the most objective and reasonable result.

□ The study suggests one value for each model to reduce the confusion for the conversion factor contract.

- Since the variables used for conversion factor calculation are estimated from future values that are not confirmed, estimation risks can be reduced by interval estimation, which substitutes the maximum and minimum values based on assumptions.
- The study used one value from point estimation despite risks of estimation error because it has been pointed out that existing studies are not appropriate for making judgments for the conversion factor contract from various outcome based on too many assumptions and methods.

□ This study presents the outcome from the three models - the SGR model, index model and the financial performance analysis model.

- Review on the methodologies showed that cost- or financial performance analysis-based conversion factor calculation concluded unrealistic from many issues as practical and objective data not being available and data creation not being possible.
- The SGR and index models can be used as the basis for judgment since the conversion factor can be

calculated using revenues (past medical performances) and the increase rate of the costs matching revenues.

- It is still difficult to reach an agreement on the outcome without the agreement among concerned parties because the SGR and index models may result in different values depending on the variables and the base year applied.

□ The study started with the aspiration of overcoming the restrictions of existing studies and identifying a practical conversion factor. During the process of reviewing the methods and data used, however, it became clear that such a conversion factor is difficult to identify under the current system.

- It will be difficult to find a conversion factor that is both agreeable and realistic in a short time frame as is referred to in the issues specified in the following limitations of the study.
- However, it can be said that it is necessary to collect data for calculating mid-to-long term conversion factor or to develop a mid-to-long term model with a research methodology to which the interested parties can agree.

1. Limitations of the study

□ Cost-based conversion factor calculation, whether using publicly announced objective cost data or detailed cost data investigated by existing studies, has the issue of data appropriateness and is limited in the research

methodology.

- With the data collected at the moment, it is difficult to precisely calculate the cost of uncovered practice fee that matches the revenues from practice fee not covered by health insurance.
  - Although cost-based conversion factor is a methodology used by many companies and has been scientifically validated, it is almost impossible to create data in the case of hospitals and clinics, and thus, the outcome based on too many assumptions are not meaningful as the conversion factor.
  - Even the hospitals adopting the ABC cost system cannot precisely classify costs of covered and uncovered practice fees.
- While precedent studies apply a relative value score conversion rate for uncovered practice of 1.78, the Korea Dental Association (KDA) claims that the conversion rate of 3.71 be applied and the Association of Korean Oriental Medicine (AKOM) suggests 2.81. This shows that the results are not stable.
- Therefore, it is not appropriate to accept the conversion factor from the cost based model, which uses these data.
- As was mentioned earlier, although the providers prefer cost-based conversion factor method for the outcome being high, it was judged much practical to use just the financial performance analysis considering that cost shifting of uncovered items are

accepted. Thus, the conversion factor has been calculated based on the financial performance analysis.

□ Revenue-related data could easily be collected during the process of gathering data for the study. In the case of cost-related data, however, publicly announced data was mostly few years older than the point of applying the conversion factor and detailed cost data could not guarantee the objectivity.

- As with precedent studies, this study also estimated costs using publicly announced data over detailed cost data. Even the publicly announced data, however, was created as necessary by the entity in charge of the data and is not appropriate for the conversion factor study. It was, thus, inevitable but to partially process the data for the study.

□ Complying with existing research methods, this study also collected as much data as possible but the appropriateness may not be fully guaranteed.

- Although publicly announced data has been considered objective at the moment, further discussion is required regarding data that can be utilized for calculating the conversion factor.

□ In the case of hospitals, the Hospital business analysis data from KHIDI is the most widely used cost data available.

- This data is also not appropriate for direct use and is limited in the fact that the data was collected without considering the study on conversion factors.
- Thus, it is necessary to revise the current survey

form to include more hospitals and consider the conversion factor study when collecting data from medical institutions above hospital level.

□ In the case of medical institutions other than hospitals, it is necessary to develop a research method to calculate the factor using publicly announced statistics data.

- The survey form should be partially revised to utilize Statistics Korea's Service Industry Census for calculating the conversion factor.

□ There may be disputes over data objectivity regarding KHIDI data or Statistics Korea's Service Industry Census data since the survey is filled in by medical institutions themselves.

- In order to resolve this issue and improve data accuracy, the feasibility of the medical institutions should be evaluated through preliminary surveys.

□ Estimation of labor costs of head doctors and pharmacists

- Although the labor costs of head doctors and pharmacists are considered very important in the cost and financial performance based conversion factor studies, there is no clear application criteria at present.
- Not only is it difficult to estimate the actual labor costs, but also, there were no discussions on whether actual labor costs should be recognized as expenses.
- If actual labor costs are recognized as expenses, institutions paying high labor costs to head doctors will result in having high expense and the conversion factor should be increased while those

paying low labor costs will have low expense and the factor should be decreased.

- There were opinions in precedent studies that 3 to 3.5 times the average wage of city workers is appropriate to be considered as head doctor's labor costs but there is no social consent yet.
- Therefore, it is necessary to set an appropriate labor cost level based on discussions regarding the level of labor costs of head doctors and pharmacists.

□ The SGR model is evaluated to be appropriate for making judgments for the conversion factor contract from the simple calculation method and data reliability. The model is limited in the fact that the outcome may change according to the point of application or the variables used as macro indices.

- Most of the recent studies calculate the conversion factor using 2004 as the base year, which is disputable since the ground for this assumption is weak.
  · This may result in providers and subscribers claiming to change the base year according to their own interests, leading to a confusion in calculating the conversion factor.
- The SGR model may produce different outcome depending on the macro indices used in the formula.
  · Macro indices may also vary depending on the point of announcement. In case estimates are announced in a certain year at the time of conversion factor calculation, the outcome will be different from the way the next year's macro indices are estimated.

□ The index model is also excellent in the methodological aspect for its simple calculation and data objectivity but has several practical issues.

- − The index model determines the conversion factor based on the difference of increase in revenues and costs. This is unfavorable to the providers because the increase in revenues is higher than the increase in costs, leading to arguments that the resulting conversion factor should be lowered.
  - · The practice fee, which impact the revenues, increase from various factors that may sometimes be from natural causes. The index model cannot reflect such factors.

2. Directions for developing mid-to-long term standard model for the conversion factor study

□ Every year, the insurer and the provider enter into negotiations based on studies carried out separately and the results were not satisfactory.

- − Thus, it is necessary to develop a standard conversion factor model that can be accepted by the insurer, provider and the subscriber groups.

□ In order to develop a standard model agreeable among interested parties;

- − The level of cost to be compensated by the conversion factor should be agreed.
  - • In principle, the conversion factor should be determined with a view to compensate the cost of

health insurance-covered practice fees. In Korea, however, it is not possible to ignore the reality of high uncovered ratio and partial cost shifting for health insurance by the uncovered section.

- Under the current fee-for-service system, it is only natural to input large numbers of resources to raise revenues. Since excessive resource input may worsen the revenue structure from increased financial costs and decreased operation rate, it should be discussed whether the conversion factor should be used to compensate up to this level.
- Precedent studies on cost- and financial performance-based conversion factor calculation estimate costs of detailed accounts by medical institution type and uses the result to separate the costs that should be included in the conversion factor. It is necessary to discuss the direct and indirect costs related to medical practices.

□ In the initial studies, the conversion factor was calculated by collecting data appropriate for cost- and financial performance-based method as profit and loss data from sample medical institutions each year. However, the effects were low compared to the actual efforts made, from insufficient number of samples and the issue of data appropriateness.

  – It is still necessary to collect detailed cost data of medical institutions since it is critical in the conversion factor study.

□ The alternative can be determining sample hospitals using statistical methods for each medical institution type and

receive cost data through cooperative ties.

- The current conversion factor studies carried out each year have little impact in determining the actual conversion factor compared to the research results. It is thus, more reasonable to determine the conversion factor through detailed analysis in three to five year intervals on the cost data from medical institutions and link the factor to MEI for the rest of the years.
- At present, medical fee is the unit cost per relative value score and the revenues of medical institutions are mainly determined by the conversion factor. In reality, the relative value score is as imbalanced as the conversion factor.
  - Therefore, the relative value score should also be actively analyzed and adjusted.
- The study on the conversion factor highly impacts the insurance premium of the subscribers, finance of NHIC and the revenues of medical institutions and it is necessary to establish a standard process.
- To this end, a joint research group of subscribers, insurers and providers should be formed to continue discussion on the source data survey method, conversion factor calculation method and the data utilized.
  - Such a joint research group for developing a standard model in the mid-to-long term will serve as a foundation for a mature conversion factor contract.