Research Paper | 13-13

A Study on the Improvement Plan of Long-term Care Insurance:

Focused on the Efficient Expenditure

December 2013
Sung-Joo Yoon

KOREA INSTITUTE OF PUBLIC FINANCE

The Korea Institute of Public Finance
28, Songpa-daero 28-gil, Songpa-gu, Seoul 138-774, Korea
Tel: 82-2-2186-2114 Fax: 82-2-2186-2179
URL: www.kipf.re.kr

ⓒ 2013 KIPF

A Study on the Improvement Plan of Long-term Care Insurance: Focused on the Efficient Expenditure

December 2013

Sung-Joo Yoon

KiPF KOREA INSTITUTE OF PUBLIC FINANCE

Contents

Ⅰ. Introduction ··· 9

Ⅱ. Current State of Elderly Long-term Care Insurance in Korea ··· 14

1. Elderly Long-term Care Insurance ··· 14
   A. Background and Purpose ··· 14
   B. Management and Operating System ··· 15
   C. Eligibility and Content of Benefits ··· 15
   D. Source of Revenue ··· 18
2. Current State of Elderly Long-term Care Insurance ··· 20
   A. Applicants and Qualified Beneficiaries ··· 20
   B. Premium Rate ··· 22
   C. Financial Earnings and Expenses ··· 23

Ⅲ. Research on Characteristics of Recipient Households of Elderly Long-term Care Insurance ··· 26

1. Basic Analysis ··· 26
   A. Research Data ··· 26
   B. Analysis on Characteristics of Recipient Households ··· 27
2. Comparison between Recipients and Non-recipients of Elderly Long-term Care Insurance: Using the Method of Propensity Score Matching ··· 35

IV. Measures for Efficiency in Benefits Spending ········· 41

1. Differentiation of Grants for Long-term Care Institutions ········· 43

A. Background ········· 43
B. Mode ········· 46
C. Simulation ········· 49
D. Considerations for Introduction of the System ········· 56

2. Differentiation of Patients' Co-payment Ratio ········· 57

A. Background ········· 57
B. Model ········· 62
C. Simulation ········· 66
D. Considerations for Introduction of the System ········· 80

V. Summary & Conclusion ········· 81

References ········· 85

List of Tables

<Table II-1> Scope of Coverage for Elderly Long-term Care Insurance ··· 16
<Table II-2> Types of Home Care Benefits ··· 17
<Table II-3> Recipients' Co-payment of Elderly Long-term Care Insurance ··· 19
<Table II-4> Yearly Approval Rate ··· 21
<Table II-5> Yearly Finances of Long-term Care Insurance ··· 24
<Table II-6> National Treasury Support ··· 25

<Table III-1> Basic Statistics for Research on Recipient Families of Elderly Long-term Care Insurance ··· 28
<Table III-2> Basic Statistics by Household Type ··· 29
<Table III-3> Analysis on Difference between Ordinary Income and Proportion of Low-income Class by Household Type ··· 32
<Table III-4> Current State of Elderly Long-term Care Insurance (Sample) ··· 35
<Table III-5> Result of Probit Analysis ··· 36
<Table III-6> Distribution of Propensity Scores of Recipients and Non-recipients ··· 37
<Table III-7> Comparison on Control Variable of Recipients and Non-recipients ··· 38
<Table III-8> Comparison of Recipients and Non-recipients (Total) ··· 39
<Table III-9> Comparison of Recipient and Non-recipient (By Income Bracket) ··· 39

<Table IV-1> Current Use of Benefit Utilization by Age (2012) ··· 42
<Table IV-2> Simulation (1): Two Grades (high vs. low) ··· 52
<Table IV-3> Simulation (2): Three Grades (high, medium, low) ··· 54
<Table IV-4> Simulation (3): Five Grades (A, B, C, D, E) ··· 55
<Table IV-5> Trends in Benefits of Long-term Care Insurance for the Elderly ··· 58
<Table IV-6> Review of Benefits by Income Level (Eligibility) ··· 59
<Table IV-7> (Uniform Distribution) Simulation Results for Two-tier Differentiation Plan (k_b=36.36%, k_a=63.64%) ··· 70

<Table IV-8> (Uniform Distribution) Simulation Results for Two-tier Differentiation Plan (k_b=50.00%, k_a=50.00%) 71

<Table IV-9> (Uniform Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 68.18%, k_a = 31.82%) 73

<Table IV-10> (Bell-shaped Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 90.50%, k_a = 90.50%) 74

<Table IV-11> (Bell-shaped Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 41.50%, k_a = 58.50%) 75

<Table IV-12> (Bell-shaped Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 75.50%, k_a = 24.50%) 76

<Table IV-13> (Bell-shaped Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 93.75%, k_a = 6.25%) 77

<Table IV-14> (Uniform Distribution) Simulation Results for Three-tier Differentiation Plan 78

<Table IV-15> (Bell-shaped Distribution) Simulation Results for Three-tier Differentiation Plan 79

List of Figures

[Figure I-1] Long-term Care Expenditure in OECD Countries in Comparison to GDP ···· 10
[Figure I-2] Estimated Revenue and Expenditure of Elderly Long-term Care Insurance ···· 11

[Figure II-1] Certified Beneficiaries in Each Grade ···· 21
[Figure II-2] Long-term Care Insurance Rate ···· 23

[Figure III-1] Proportion of Low-income Class by Household Type ···· 33
[Figure III-2] Proportion of Households by Household Type and Income Bracket ···· 34

[Figure IV-1] Distribution of Care Expenses by Eligibility Requirements (First-half 2012, Second-half 2011) ···· 60
[Figure IV-2] Fixed-rate Co-payment (Current System) ···· 61
[Figure IV-3] Differentiation of Patients' Co-payment Ratio: Linear ···· 62
[Figure IV-4] Differentiation of Patients' Co-payment Ratio: Two-tier System ···· 63
[Figure IV-5] Differentiation of Patients' Co-payment Ratio: Three-tier System ···· 65
[Figure IV-6] Review of General Recipients by Eligibility Score ···· 68
[Figure IV-7] Assumed Distribution on the Actual Number of Patients among Grade Three General Recipients ···· 69

I. Introduction[1)]

Long-term care refers to the service provided to those unable to independently conduct activities of daily living (ADL) such as bathing and dressing due to prolonged mental and physical problems, thereby requiring assistance to do so. The beneficiaries of long-term care services include the elderly suffering from chronic mental and physical problems due to old age as well as the disabled. In particular, long-term care insurance for the elderly is designed for senior citizens.

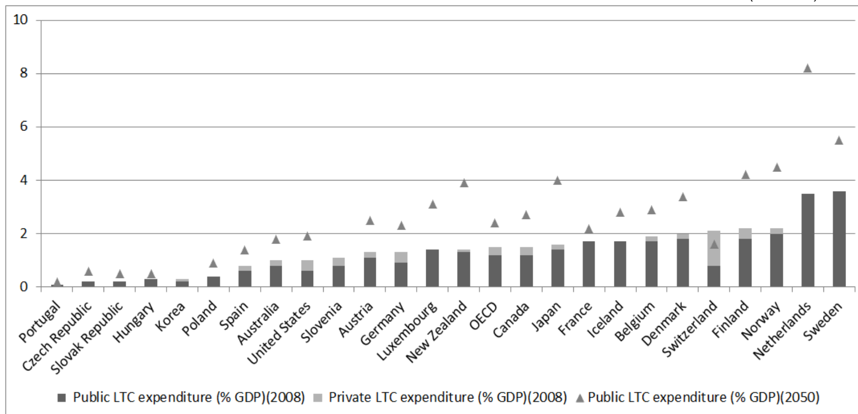
The responsibility for long-term care towards the elderly is placed on the elderly themselves, their families, or society, depending on each country, prevailing philosophical viewpoint in society, and demographic structure. The demand for long-term care of the elderly is expected to growth due to the low birth rate, population aging and structural changes in family and society due to various factors, including the global trend of increasing economic activities by women.

Combined ith the increased demand for elderly long-term care, rising income levels raises the demand for better services, which is expected to lead to a surge in long-term care expenditures for the elderly.

1) 〈Yoon Sung-Joo, "Current Situation and Future Tasks for Elderly Long-term Care Insurance," *Monthly Public Finance Forum*, 2013. 8.〉, which was published during the time when this research was conducted, contains part of this research.

[Figure I-1] **Long-term Care Expenditure in OECD Countries in Comparison to GDP**

(Unit: %, GDP)



Source: OECD, 2011.

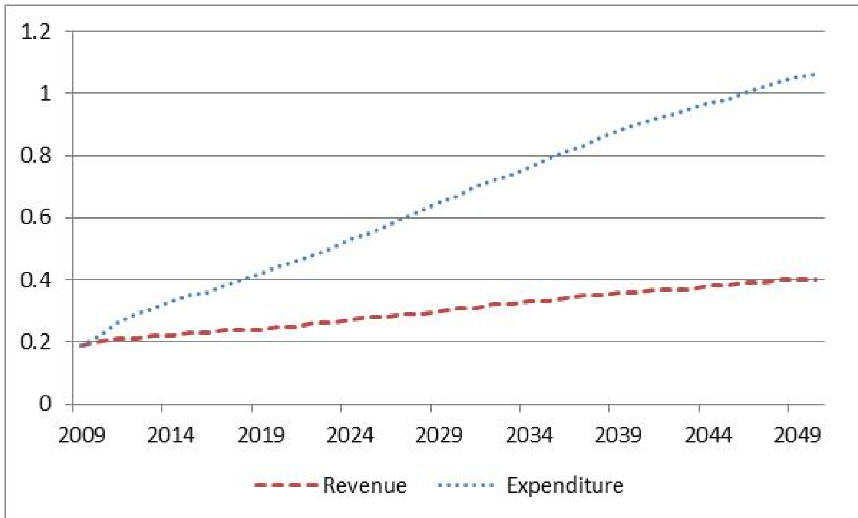
As of 2008, OECD member countries spent an average of 1.5 percent of their GDP on long-term care for the elderly, but the ratio is expected to double or more in many countries by 2050 ([Figure I-1]).

Korea preemptively introduced long-term care insurance for the elderly in 2008, when population aging was less of a concern than in other countries, and the program has been in operation for six years to date. As of 2013, Korea's over-65 elderly population accounts for 12.2 percent, which is expected to more than triple to 37.4 percent by 2050. In particular, those who are over 85 years old and face need for long-term care are estimated to increase from 0.9 percent in 2013 to an estimated 7.7 percent in 2050, and therefore the expenditure for the elderly long-term care insurance is likely to surge in the future (2013 Statistics on the Elderly). Park Hyeong-su and Jeon Byung Mok (2009) estimate that the expenditure on the elderly long-term care insurance would increase from 0.19 percent of GDP in 2009 to 1.06 percent in 2050,[2] and the fiscal deficit would surge from 0.19 percent of GDP in 2020 to 0.66 percent in 2050.

2) Park Hyeong-su and Byeong-mok Jeon, 2009, Scenario 3, baseline.

[Figure I-2] **Estimated Revenue and Expenditure of Elderly Long-term Care Insurance**

(Unit: % GDP)



Note: Park Hyeong-su and Byung Mok Jeon, 2009.

As the population aging continues to accelerate, the problem of elderly long-term care is expected to significantly impact society and national finance, along with child-rearing and childcare. Since the introduction of the elderly long-term care insurance system, there has been an abundance of studies on the management and operation of the system, such as job creation effects, clinical performance, satisfaction survey, measures to link with medical and social services, measures to root out illegal beneficiaries, and assessment-based grading. However, there has been a dearth of discussions on the system’s sustainability in terms of expenditure.

Conducted by the National Health Insurance Service (NHIS) in May 2013, the service satisfaction survey on the elderly long-term care insurance discovered that the level of satisfaction on the overall system had increased to 88.5 percent as a 1.6-percent increase from 2011. Despite the high level of overall satisfaction, however, several problems have been discussed consistently such as the public nature of the system, as well as the quality and coverage

of the service. Korea's long-term care service is operated as a universal social insurance, which may attest to its public nature from an institutional perspective (Jang Ho-yeon, 2012). There is also the criticism that the overall objectivity and reliability of the NHIS, as well as the public interest in the system, are negatively affected by the numerous problems in Korea's long-term care insurance, including insufficient coverage for beneficiaries, moral hazard among service providers due to rapid increase in private nursing homes and service provision based on market mechanisms, and diminished benefits from a low level of contributions (Jang Bong-seok, 2012).

With regards to the quality of the service, service providers have been criticized for the systemic problems incurred by market mechanisms (Jang Bong-seok, 2012). Also, the lack of willingness to respond to beneficiaries' needs, the absence of an integrated management system, inefficient management and finance system, and the lack of feedback evaluation are considered to contribute towards the deteriorating quality of service (Kim Chan-u, 2013; Kim Chan-u, March 5, 2013).

In terms of coverage, there is a constant demand to expand eligibility for the elderly long-term care insurance. Regarding the range of benefits, major concerns include the lack of development efforts on new services, and the policy focus on separating the patient from the caregiver for a given period (Kim Chan-u, March 5, 2013).

Current concerns and problems surrounding the elderly long-term care insurance relate to financial issues, such as insurance premiums and benefits payments. However, detailed research on the financial aspects of the elderly long-term care insurance remains in its infancy, and there is only an abstract general consensus on the importance of finances and the necessity of charging higher premiums.

Existing studies on financial spending include Yun Hee-suk et al. (2010), Lee Eunkyeong (2010), and Park Hyeong-su and Jeon Byung Mok (2009). Yun Hee-suk et al. (2010) calculated financial spending on the elderly long-term care insurance based on microscopic data, while Lee Eunkyeong (2010) and Park Hyeong-su and Jeon Byung Mok (2009) focused on macroscopic data. Despite the application of different estimation methods, both sets of estimation results corroborated that the system is expected to require a much greater fiscal

expenditure than projections prior to its introduction (Park No-Wook and Byeong-hil Jeon, 2011).

The analysis of financial estimations of the system presented by Seonu Deok (2012) suggested a number of directions for improving elderly long-term care insurance. In his study, the author analyzed changes in the fiscal balance from the system's adoption to the end of 2011, and concluded that the rapid increase in expenditure compared to earnings is caused by a growing demand for service due to its low insurance premiums and increasing beneficiaries at grade three. In the face of expanding fiscal expenditure, Seonu suggested greater efficiency in spending management and optimization of services, albeit without providing detailed guidelines to such purposes.

This study examines measures for more efficient spending for the elderly long-term care insurance in relation to two aspects: performance-based differentiation of grants for long-term care institutions, and usage-based differentiation of the patient's cost burden. Efficiency in spending is related to not only financial reduction but also the quality of service in terms of the value for money. Grant differentiation is a measure designed to progressively utilize the performance evaluation of long-term care institutions, and co-payment differentiation is a measure adopted from overseas examples of medical insurance systems and applied to South Korea's elderly long-term care insurance.

The composition of this study is as follows. In Section II, this study summarizes the current state of South Korea's elderly long-term care insurance. In Section III examines the economic characteristics of families covered by the insurance and those that are not, based on the data of the Korea Welfare Panel Study, in order to determine whether recipient families are ready to accept institutional changes such as co-payment differentiation. Section IV contains the most important part of this study, which suggests grant differentiation for long-term care institutions and co-payment differentiation for recipients as measures to enhance efficiency in expenditure, and analyzes models and simulations to calculate fiscal savings to the system following the suggested reforms. Lastly, Section V contains the summary and conclusion of this study.

Ⅱ

Current State of Elderly Long-term Care Insurance in Korea

1 Elderly Long-term Care Insurance[3)]

A. Background and Purpose

The number of the elderly in need of care and protection is rapidly on the rise due to the trend of population aging, and the responsibility for their care is increasingly falling on the state and society as opposed to families, due to the changes in social structure, such as low birth rate, nuclearization of families, and growing prominence of women in economic activities. Also, the burden of expensive costs and long-term hospitalization in recovery facilities are likely to have a negative effect on the finances of the national health insurance.

3) NHIS, *2011 Statistical Yearbook of Elderly Long-term Care Insurance*, 2012, Extracted and rearranged from "I. Introduction on Elderly Long-term Care Insurance"; The second chapter of the study of Yoon Sung-Joo (2013).

Since July 2008, Korea has adopted and provided long-term care insurance for the elderly as a form of social insurance to senior citizens unable to conduct activities of daily living (ADL) including physical and housekeeping activities. The aim of this insurance is to provide benefit services necessary to the elderly, ensure health and stable livelihoods in old age, relieve the burden of care-giving families and improve their quality of life.[4)]

B. Management and Operating System

The elderly long-term care insurance project is conducted in concert by the Ministry of Health and Welfare, the National Health Insurance Service (NHIS), long-term care institutions, and local governments. Overseeing the entire program, the Ministry of Health and Welfare sets the basic plan for long-term care. As the primary insurer, the NHIS is in charge of eligibility control, contribution rates and collection, applicant grading, benefit management and evaluation, assessment and provision of benefit costs, survey, research and promotion on the system, and the service delivery system. Long-term care institutions enter into contract with graded beneficiaries, provide long-term care service, and claim expenses from the NHIS for their services. Local governments establish and implement detailed plans for implementation based on the basic plan for long-term care, and support the long-term care business with the authority to set up and designate long-term care institutions.

C. Eligibility and Content of Benefits

Beneficiaries of the elderly long-term care insurance are senior citizens over 65 years old or those suffering from geriatric diseases, who are thereby unable to conduct ADL independently over a period of at least six months, following the application, review, certification for eligibility, and grading into one of three beneficiary categories.

Regardless of income level, persons at least 65 years of age or those

4) Article 1 of Act on Long–Term Care Insurance for Senior Citizens

below with geriatric diseases can apply for long-term care benefits at long-term care institutions located at a branch of the NHIS. Once the application is filed, a trained NHIS employee visits the applicant's residence to survey functional conditions, environmental conditions, and demand for services across five areas (52 items) such as basic capacity for activities of daily living (ADL), cognitive function, behavioral change, medical treatment, and areas for rehabilitation. When the applicant is found to be unable to carry out ADL for over six months based on the survey visit by the NHIS employee along with medical opinion, the Needs Assessment Committee established in each city, county and district deliberates on and assigns a rating according to judgment standards including physical and mental conditions and the level of need for long-term care. There are three ratings (grades one to three) based on the long-term care eligibility score,[5] with persons in need of most assistance comprising grade one.

〈Table II-1〉 **Scope of Coverage for Elderly Long-term Care Insurance**

Classification	Scope
Coverage	Entire population [Long–term care insurance policyholders and dependents (same as national health insurance) + beneficiaries of medical aid] ※ Beneficiaries of medical aid are not policyholders of national health insurance and long–term care insurance, but they are covered by the central and local governments.
Insurance premium payers	National health insurance policyholders. Insurance premiums for company–sponsored subscribers and local subscribers are calculated in the same way with the health insurance system
Applicants for long–term care	Persons at least 65 years of age or those below 65 with geriatric diseases
Beneficiaries of long–term care	Among the applicants for long–term care, who cannot conduct ADL for over six months and who have been certified by the Needs Assessment Committee as a person eligible for long–term care

Source: NHIS, *2011 Statistical Yearbook of Long–term Care Insurance for the Elderly*, 2012

5) Grade one: those requiring assistance in all aspects of daily life. Grade two: those requiring assistance in most parts of daily life. Grade three: those requiring assistance in some parts of daily life.

Long-term care centers notify assessed and approved applicants with the approval certificate[6] and the standard long-term care usage plan[7] following categorization into one of the three beneficiary grades by the Needs Assessment Committee, which allows the approved applicant to begin receiving the long-term care service. Each beneficiary selects a long-term care institution and enters into a long-term care benefits contract. The relevant long-term care institution then establishes the detailed benefit plan (schedule) by reflecting the standard long-term care usage plan and contract, upon which the benefits service commences.

〈Table II-2〉 **Types of Home Care Benefits**

Type	Content
Home-visit care	A long-term caregiver visits a beneficiary's residence and supports physical activities and housekeeping activities.
Home-visit bathing	A long-term caregiver visits a beneficiary's residence and provides a bathing service with the help of bathing equipment.
Home-visit nursing	A long-term caregiver, e.g. a nurse, visits a beneficiary's residence to provide counseling on treatment and check the beneficiary's dental hygiene according to the directions of a doctor, traditional Korean doctor, or dentist
Day and night care	A long-term care institution takes care of a beneficiary for a fixed amount of time each day to support the beneficiary's physical activities and provide education and training necessary to improve physical and mental status.
Short-term respite care	A long-term care institute takes care of a beneficiary for a certain period of time designated by the Ministry of Health and Welfare to support the beneficiary's physical activities and provide education and training necessary to improve physical and mental status.
Others (welfare equipment)	A beneficiary is provided with equipment needed for daily and physical activities or he/she is visited and provided with support necessary for rehabilitation according to the presidential decree.

Source: NHIS, *2011 Statistical Yearbook of Long-term Care Insurance for the Elderly*; Article 23(1), Act on Long-Term Care Insurance for Senior Citizens (2012).

6) The approval certificate is filled with the long-term care grade, expiration date, type of long-term care benefits, etc.

7) The standard long-term care usage plan reflects the functional status and desired service of each beneficiary to allow the recipient to use the service within the monthly limit.

Benefits include home care, facility care and special cash benefits. Home care benefits are divided into six categories: home-visit care, bathing, nursing, day and night care, short-term respite care and others (welfare equipment). The maximum monthly payment as of 2013 amounts to 1,140,600 won for grade one, 1,003,700 won for grade two, and 878,900 won for grade three.

Facility care benefits refer to long-term care services provided by an elderly medical welfare facility within a long-term care institution, in order to support physical activities and to provide education and training necessary to improve the physical and mental status with regards to its residents, while non-benefit items to be covered by the beneficiaries themselves include costs for preparing meals, higher-quality bedrooms, and haircutting. Special cash benefits are specified as family care fees, special care fees and nursing fees for convalescent hospital as benefit items, but currently only family care fees are paid in cash to the beneficiaries of all grades with the fixed amount of 150,000 won a month.

D. Source of Revenue

The revenue for the elderly long-term care insurance is comprised of insurance premiums, central government support, medical aid contributions from the central and local governments, and other revenues.

Total Revenue of Elderly Long-term Care Insurance
= Insurance Premiums + Central Government Support
+ Medical Aid Contributions + Other Resources

Premiums for the elderly long-term care insurance comprise a part of the health insurance premiums, and the NHIS charges a fee combining both the health insurance and the long-term care insurance. At this point, the NHIS issues separate notifications on premiums for the long-term care insurance and the health insurance, which are also placed under separate accounts. The rate of insurance is decided by a presidential decree after deliberations of the Long-term Care Committee. Local subscribers of the long-term care insurance pay 100 percent of premiums, while company-sponsored subscribers pay only

50 percent, with the rest paid by their employers. In the case of public servants and teachers, the premium is split evenly between the central and local governments. In the case of private school teachers, the school and the state pay 30 percent and 20 percent, respectively.

Each year, the state is obligated to provide the NHIS with 20 percent of the estimated premiums of long-term care insurance within the yearly national budget. Also, the central and local governments cover the NHIS' share of expenses for providing long-term care benefits, issuing doctor's notes, and written instructions for home-visiting nurses, along with all management and operational expenses.

According to Article 40 of the Act on Long-Term Care Insurance for Senior Citizens, beneficiaries of the insurance service are required to make a partial contribution to the costs. In other words, general beneficiaries who receive home care or facility care benefits must pay 15 percent and 20 percent of the long-term care costs, respectively. However, beneficiaries of medical aid may claim a 50 percent discount on their co-payment if their income or wealth falls below the level designated by the health and welfare minister, or if their livelihood is in danger due to reasons such as natural disasters designated by

〈Table II-3〉 **Recipients' Co-payment of Elderly Long-term Care Insurance**

	Home care benefits	Facility care benefits
General beneficiary	15% of long-term care benefit cost	20% of long-term care benefit cost
Discount recipient (beneficiary of other medical aids)	7.5% of long-term care benefit cost	10% of long-term care benefit cost
Beneficiary of national basic livelihood	Exempted	Exempted

Note: Excluding patients' co-payment, the remaining cost of elderly long-term care benefit is borne by the NHIS or the state (local government). Excluding co-payment of general beneficiaries and discount recipients, the remainder is borne by the NHIS. Benefit costs for beneficiaries of other medical aids are paid by the central and local governments at an 80:20 ratio (in the case of Seoul, at a 50:50 ratio). Benefit costs for beneficiaries of national basic livelihood are covered entirely by local governments (decentralization tax included).

the health and welfare minister,[8] while beneficiaries of the National Basic Living Security Act are totally exempt from co-payment. However, in cases where the long-term care service given is not included in the legal stipulation of scope and eligibility, or where the benefits received differs from the type or content specified in the initial certification, the beneficiary must pay the entire amount of the difference in cost or recompense the amount received in excess of the monthly limit.

2 Current State of Elderly Long-term Care Insurance[9]

A. Applicants and Qualified Beneficiaries

Since the introduction of the elderly long-term care insurance in 2008, the number of senior citizens over the age of 65 and those approved to receive benefits has continued to rise. In the case of 2012, among the total aged population of 5,921,977, 10.86 percent (643,409) applied for the insurance, while 77 percent (495,445) of the applicants were certified within the grades (grades one to three) or outside of the general grades (grades A to C), comprising 68.9 percent and 31.1 percent, respectively.

As of 2013, 8.37 percent of the total senior population is certified with general or non-general grades, and those approved to receive elderly long-term care insurance benefits is at 5.8 percent, a 1.6 percent increase from 2008. Examining certified beneficiaries by each grade, those in grade one as those with the most serious health conditions, decreased by 19,134 in 2012 from the adoption of the system in 2008, while those in grade two increased by 12,232. Those in grade three surged from 98,697 in 2008 to 232,907 in 2012, because the eligibility score for the grade had been lowered since the introduction of the system.

8) Those eligible for a discount, and beneficiaries of other medical aids.

9) The second chapter of the study by Yoon Sung-Joo (2013): Partially edited with latest figures.

〈Table II-4〉 **Yearly Approval Rate**

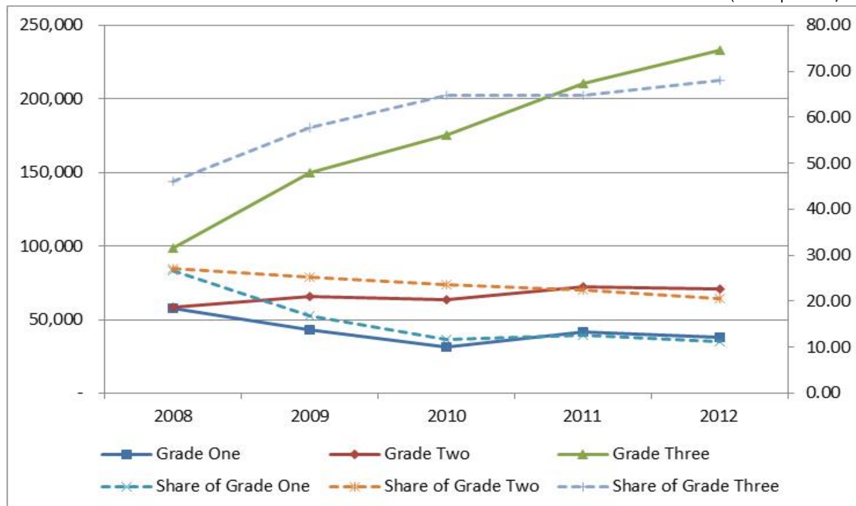
(Unit: number of persons)

	2008	2009	2010	2011	2012
Senior population (A)	5,086,195	5,286,383	5,448,984	5,644,758	5,921,977
Applicant	355,526	522,293	622,346	617,081	643,409
Certified (B)	265,371	390,530	465,777	478,446	495,445
Qualified beneficiary (C)	214,480	286,907	315,994	324,412	341,788
Approval rate (C/B, %)	80.8	73.5	67.8	67.8	68.9
Proportion (C/A, %)	4.2	5.4	5.8	5.7	5.8

Note: 1. Senior population refers to those over 65 years old.
2. Certified refers to applicants given a general or non-general grade.
3. Based on year's end (Excluding deaths)
Source: NHIS, *2012 Statistical Yearbook of Long-term Care Insurance for the Elderly*, 2013

[Figure II-1] **Certified Beneficiaries in Each Grade**

(Unit: person, %)



Source: NHIS, *Statistical Yearbook of Long-term Care Insurance for the Elderly*, annual

Examining yearly changes in the proportion of each grade, the share of those in grade one shrank by 15.57 percent from 26.76 percent in 2008 to 11.19 percent in 2012. The share of grade two had also decreased by 6.65 percent during the same period. The proportion of those in grade three, however, has continuously risen since 2008 to mark 68.14 percent as of 2012, up by 22.13 percent from 2008.

B. Premium Rate

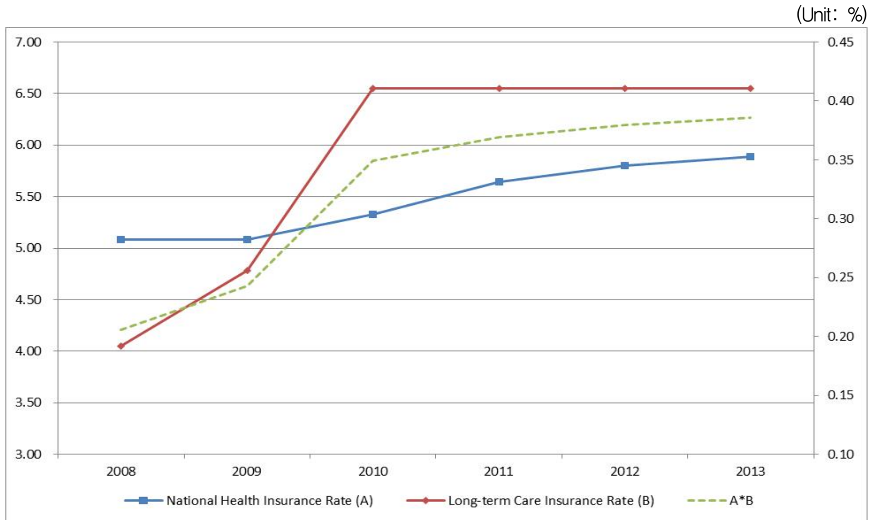
The premium rate of the long-term care insurance at the time of introduction in 2008 was 4.05 percent, which was then raised to 4.78 percent and 6.55 percent in 2009 and 2010, respectively. Since 2010, it has remained at 6.55 percent.

National Health Insurance Premium = Monthly Remuneration Amount
× National Health Insurance Rate
Long-term Care Insurance Premium = National Health Insurance Premium
× Long-term Care Insurance Rate
= Monthly Remuneration Amount × National Health Insurance Rate
× Long-term Care Insurance Rate
(*Combined Rate* ≡ National Health Insurance Rate
× Long-term Care Insurance Rate)

The standard for long-term care insurance rate is the national health insurance premium, which in turn is decided by the monthly remuneration amount and the national health insurance rate. Therefore, even when the long-term care insurance rate remains unchanged, a rise in the national health insurance rate leads to an increase in the long-term care insurance rate. The combined rate, which is the national health insurance rate multiplied by the long-term care insurance rate, has increased each year to reach 0.39 percent as of now in 2013 from 0.21 percent in 2008.

[Figure II-2] **Long-term Care Insurance Rate**

(Unit: %)



Source: NHIS DB

C. Financial Earnings and Expenses

A year after the introduction of the system, the earnings and expenses of the insurance in 2009 were 2,084.9 billion won and 1,908.5 billion won, respectively, which have since increased by 70.83 percent and 53.91 percent to 3,561.7 and 2,937.3 won in 2012. The ratio of expenses against earnings has been on the decrease since 2009, but as of 2012 the insurance system remains in the black. The size of accumulated reserves of the elderly long-term care insurance, which has scored a surplus year-on-year since the introduction in 2008, is 1,125.8 billion won at present as of 2012.

The ratio of the benefits payment amount to the premium amount is 115.33 percent, which shows that the amount of insurance benefits disbursed to recipients is greater than of the revenue from insurance premiums. However, the ratio of insurance benefits to insurance premiums as a proportion of support from the national treasury and contributions for medical aid is 78.4 percent as

〈Table II-5〉 **Yearly Finances of Long-term Care Insurance**

(Unit: thousand won, %)

Finances		2008	2009	2010	2011	2012
Earnings	Total (A)	868,974,878	2,084,929,125	2,877,740,484	3,263,144,467	3,561,672,883
	Premium (A1)	477,011,336	1,199,551,493	1,831,554,777	2,142,331,738	2,369,669,274
	National treasury (A2)	120,747,289	204,351,491	332,318,000	388,311,000	415,243,000
	Contribution for medical aid (A3)	266,136,914	660,082,482	670,449,396	677,321,582	701,778,005
	- State contributions	8,660,977	41,596,688	20,918,791	29,852,191	29,250,315
	- Local government contributions	257,475,937	618,485,795	649,530,606	647,469,391	672,527,690
	Others	5,079,339	20,943,659	43,418,312	55,180,147	74,982,604
Expenses	Total (B)	554,900,682	1,908,462,509	2,589,135,289	2,787,757,045	2,937,321,848
	Insurance benefits (B1)	431,414,460	1,746,732,140	2,415,263,200	2,602,664,029	2,732,832,824
	- Home care benefits	164,572,216	985,020,419	1,374,034,284	1,374,494,160	1,329,687,078
	- Facility care benefits	262,858,254	754,497,938	1,033,622,638	1,221,074,725	1,396,220,453
	- Dependents support expenses	563,575	1,656,125	1,316,395	1,048,855	983,680
	- Doctor's note	3,339,244	5,358,103	6,076,020	5,858,483	5,748,117
	- Instructions for nurses	81,171	199,555	213,863	187,806	193,496
	Management and operation	107,897,151	135,720,376	144,136,771	155,570,596	166,255,556
	Others	15,589,071	26,009,993	29,735,318	29,522,420	38,233,468
Ratio of expenses to earnings (B/A)		63.86	91.54	89.97	81.98	82.47
Ratio of insurance benefits to contributions (B1/(A1+A2+A3))		49.94	84.63	85.21	77.6	78.4
Difference (A-B)		314,074,196	176,466,617	288,605,196	475,387,422	624,351,035
Carry-over		291,074,196	385,140,812	470,946,009	555,133,430	746,374,053
Accumulated reserves (E)		23,000,000	105,400,000	308,200,000	699,400,000	1,125,800,000
Accumulation rate (E/B1)		5.33	6.03	12.76	26.87	41

Note: 1. Based on annual year-end closing account. (Year 2008 covers the period from July 2008 to December 2008)
2. Employer contribution is included in the premium.
3. Other earnings refers to the income gained from outside of business such as interest on deposits, miscellaneous fees collected, additional charges, etc.

Source: NHIS Health Insurance DB.

of 2012, which proves that overall earnings are higher than the expenses. The level of legal state funding support is specified as 20 percent of the expected earnings, but the actual support from the national treasury failed to reach 20 percent with the sole exception of 2008, the year of the system's introduction. Nonetheless, the actual scale of state financial support is currently rising.

〈Table II-6〉 **National Treasury Support**

(Unit: thousand won)

	2008	2009	2010	2011	2012
Premium (A)	477,011,336	1,199,551,493	1,831,554,777	2,142,331,738	2,369,669,274
Legal support of national treasury (A×20%)	95,402,267	239,910,299	366,310,955	428,466,348	473,933,855
Actual support of national treasury	120,747,289	204,351,491	332,318,000	388,311,000	415,243,000
Legal support of national treasury – actual national treasury support	−25,345,022	35,558,808	33,992,955	40,155,348	58,690,855

Research on Characteristics of Recipient Households of Elderly Long-term Care Insurance

1 Basic Analysis

A. Research Data

This study uses data from the seventh wave of *the Korea Welfare Panel Study (*KoWePS*)* to analyze the characteristics of recipient families of the elderly long-term care insurance. The KoWePS extensively collects samples of low-income families in order to understand the household structure and income levels among the poor and near-poor classes using the resulting data to research support policies for poor families and the effects of the policies. As a result, compared to other panel surveys, the data of the KoWePS has advantages in that it includes a variety of information on recipients of welfare programs including the elderly long-term care insurance, the subject of this study.

B. Analysis on Characteristics of Recipient Households

This chapter uses the seventh survey material of the KoWePS, which presents information for 2011, to identify the characteristics of recipient families of the elderly long-term care insurance. By analyzing the features of recipient families from an economic perspective, in particular, this chapter aims to conduct an initial study on the feasibility of co-payment differentiation, which will be extensively dealt with in the following section.

It is difficult to accurately identify the characteristics of recipient families of the elderly long-term care insurance by comparison to their non-recipient counterparts, since the latter may not contain a family member eligible for the insurance service. In consideration of this concern, this study selected an analysis sample of 2,080 families with a family member aged over 65 from a total of 5,732 families included in the KoWePS data.

Examining the basic statistics drawn from the sample, 4.86 percent (101 households) among the sample consisting of households with a family member aged over 65 had the experience of benefitting from the elderly long-term care insurance, and 21 households[10)] had experience of benefitting from the elderly care service. The average of ordinary income and disposable income is 18.46 million and 17.7 million won, respectively. Among the sample, 75.38 percent consisted of low-income families with incomes below 60 percent of the median income.

The average number of family members is 2.2, and a considerable number of households are expected to be comprised of an elderly couple over the age of 65. The ratio of households with a senior in poor health, a person with a chronic disease, or a person with a disability is 54.76 percent, 94.33 percent, and 27.93 percent, respectively.

The average amount of pension received by the sample families is 910,000 won, most of which is comprised from public pensions while a negligible

10) In the case of the elderly care service, only 90 families were subject to the survey, and therefore the percentage $(0.233 = \frac{21}{90})$ has little significance.

〈Table III-1〉 **Basic Statistics for Research on Recipient Families of Elderly Long-term Care Insurance**

	Variable	Average	Standard deviation	Minimum value	Maximum value
House hold	Recipient family of elderly long–term care insurance	0.0486	0.2150	0	1
	Recipient family of elderly care service	0.2333	0.4253	0	1
	Ordinary income (10 thousand won)	1,846.4970	2,003.7040	89	29,867
	Disposable income (10 thousand won)	1,769.9820	1,820.5490	65	27,719
	Low–income class	0.7538	0.4309	0	1
	No. of family members	2.0236	1.2526	1	9
	Presence of ailing senior family member	0.5476	0.4978	0	1
	Presence of a family member with a chronic disease	0.9433	0.2314	0	1
	Presence of a family member with a disability	0.2793	0.4488	0	1
	Public pension	89.4442	315.5596	0	7,200
	Private pension	1.2471	30.6751	0	1,200
	Pension	90.6914	319.1020	0	7,200
	Holders of national health insurance	0.8707	0.3356	0	1
	Holders of private health insurance	0.1663	0.3725	0	1
	Spending on healthcare	14.8130	22.2532	0	271
	No. of outpatient treatment	30.5635	40.3297	0	330
	No. of days of hospitalization	4.6986	17.5192	0	270
	Seoul/Metropolitan cities	0.3149	0.4646	0	1
Head of family	Age	69.6962	11.6198	20	92
	Female	0.4471	0.4973	0	1
	High–school graduate or with higher education	0.0668	0.2498	0	1

Note: 1. The observed value is 2,080 households. In the case of the elderly care service, 21 families out of the targeted 90 were beneficiaries.
2. The standard for low–income households is set at 60 percent of median income (equalized household income).

amount originates from private pensions. Among sample families, 87.07 are public pension subscribers, mostly the national health insurance, while the proportion of households with private health insurance is 16.63 percent, which is relatively low.

The average healthcare spending of the sample families is 150,000 won, with an average 30.56 occasions of outpatient treatment and 4.7 days of hospitalization. The proportion of households with a female head of family is 44.71 percent, and 6.68 percent of family leaders had attained high-school education or above. The average age of a household head is 69.7 years old, which implies the sample families featured mostly elderly households.

〈Table III-2〉 **Basic Statistics by Household Type**

	Recipient of elderly long-term care insurance	Recipient of elderly care service	Non-recipient with an ailing family member aged over 65	Non-recipient without an ailing family member aged over 65
Ordinary income (10 thousand won)	2,378.46	1,133.57	1,547.67	2,002.88
Low-income class	0.66	0.90	0.82	0.71
No. of family members	2.49	1.33	1.86	1.99
Presence of ailing senior family member	0.90	0.71	1.00	0.00
Pension	99.41	20.00	84.89	100.84
Holder of private health insurance	0.25	0.05	0.09	0.22
Spending on healthcare	30.68	7.70	16.03	11.69
Age	68.61	74.86	71.47	68.81
Female	0.33	0.67	0.50	0.41
High-school education or above	0.12	0.05	0.04	0.08
Co-payment (10 thousand won)	74.60	12.19	-	-
Observed value	101	21	1,013	878

Note: 1. The standard for low-income households is set at 60 percent of median income (equalized household income).
2. The observed value of 〈Table III-2〉 is lower than that of 〈Table III-1〉, since the former is partially comprised of the latter.

To understand the features of recipient families of the elderly long-term care, this analysis only included households with at least one elderly over the age of 65. Based on <Table III-1>, non-recipient families of the elderly long-term care are subdivided into recipients of the elderly care service, non-recipients with an ailing member aged over 65, and non-recipients without an ailing member aged over 65. Accordingly, <Table III-2> shows basic statistics with the sample families divided into four types.

In terms of basic characteristics, recipient families with experience of the elderly care service had the lowest level compared to the other three groups with regards to ordinary income, pension, healthcare spending, rate of holding private health insurance, and number of family members. Also, the said group showed the highest level in the age of household leaders and the proportion of female household leaders, which demonstrates that the features of a head of family is highly likely to influence household income. The group's co-payment is an average of 120,000 won, which is relatively low compared to an average patients' co-payment for the elderly long-term health insurance, which is 750,000 won. The basic statistics for families with experience of the elderly long-term care service can be interpreted in context of the fact that the elderly care project primarily targets low-income families and seniors living alone.

Non-recipient households of the elderly care service can be divided into families with an ailing family member aged over 65 and those without, the latter group yielded lower figures in the age of household heads and the proportion of female household heads. Also, non-recipient households without an ailing family member aged over 65 showed the higher level in ordinary income, pension income, and possession of private health insurance than those with an ailing family member aged over 65. Regarding the proportion of the low-income class and healthcare spending, those with an ailing family member aged over 65 showed a higher level than those without. In other words, when comparing the two groups divided based on the presence of an ailing family member aged over 65, the results are in line with common sense expectations.

The aim of this analysis is to identify the distinguishing features of households with experience of the elderly long-term care insurance in comparison to other groups. Among the aforementioned four groups, households with experience of the elderly long-term care insurance had the highest ordinary

income, and the lowest proportion of the low-income class. The said group also showed the lowest level in the age of household heads and the proportion of female household heads, as well as the highest level in the educational attainment of household heads, possession of private health insurance, and spending on healthcare. Therefore, <Table III-2> suggests that the group of families with experience of the elderly long-term care insurance generally faces better social and economic conditions compared to the other three groups.

The major goal of this analysis is to examine the economic status of each household type, which firstly requires the verification of whether the differences in the level of ordinary income and the proportion of low-income class among the four groups are statistically significant. Therefore, the results drawn by analysis of variance (ANOVA) are shown in <Table III-3>. Firstly, this study must set a null hypothesis that all four types of groups - (A) recipients of the elderly long-term care insurance, (B) recipients of the elderly care service, (C) non-recipients with an ailing family member aged over 65 and (D) non-recipients without an ailing family member aged over 65 - are the same in terms of the average value of ordinary income, shown as the following equation:

$$H_0 \ : \ \mu_A + \mu_B + \mu_C = \mu_{\pounds}$$

The null hypothesis above is dismissed at the significance of one percent. The proportion of low-income class shows a similar result.

Next, this study must compare the two groups with an ailing family member aged over 65; recipients and non-recipients of the long-term care insurance. This is in order to assess the correlation between participating in elderly long-term care insurance and the economic conditions of the household, with regards to families with an ailing senior. As shown in the last two tables of <Table III-3>, the null hypothesis that the average level of ordinary income and the proportion of low-income class are the same in the two groups can be set as follows:

$$H_0 \ : \ \mu_A = \mu_c$$

This null hypothesis is dismissed at the significance of one percent.

〈Table III-3〉 Analysis on Difference between Ordinary Income and Proportion of Low-income Class by Household Type

Analysis of Variance (Ordinary Income: Comparison of 4 Types)

Source	SS	df	MS	F	Prob 〉 F
Between groups	390569306	4	97642326.5	25.47	0.0000
Within groups	7.9563E9 +09	2057	3834342.34		
Total	8.3468E+09	2079	4014829.08		

Analysis of Variance (Low-income Class: Comparison of 4 Types)

Source	SS	df	MS	F	Prob 〉 F
Between groups	14.4987735	4	3.62469336	20.25	0.0000
Within groups	371.470457	2057	0.17902191		
Total	385.969231	2079	0.18565139		

Analysis of Variance (Ordinary Income: Comparison of 2 Types)

Source	SS	df	MS	F	Prob 〉 F
Between groups	63390191.7	1	63390191.7	22.07	0.0000
Within groups	3.1939E+09	1112	2872186.71		
Total	3.2573E+09	1113	2926560.48		

Analysis of Variance (Low-income Class: Comparison of 2 Types)

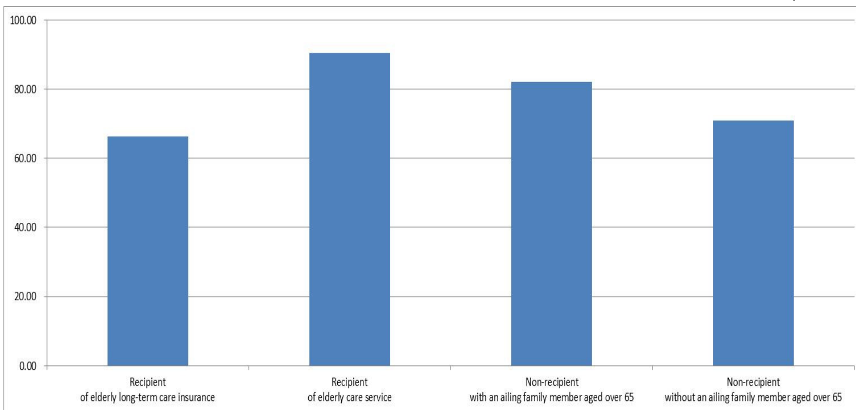
Source	SS	df	MS	F	Prob 〉 F
Between groups	2.26295059	1	2.26295059	14.64	0.0001
Within groups	1.7186E+02	1112	0.15454635		
Total	1.7412E+02	1113	0.15644069		

Therefore, ANOVA shows that the four types of households included in the sample have different levels of ordinary income and different proportions of low-income class. The subsequent sections of this study shall examine the economic circumstances of each group, focusing particularly on the group of recipients of the elderly long-term care insurance.

With regard to the proportion of the low-income class in each household type as shown in [Figure III-1], recipients of the elderly care service have the highest level of low-income class at around 90 percent, because the elderly care service essentially targets senior citizens with low income or no other co-habiting family member. Next, the low-income class comprised 82 percent of non-recipients with an ailing family member aged over 65, while those without are comprised of 71 percent of low-income class. This illustrates that those families with a sick, old person are more likely to fall below 60 percent of median income than those without. In the case of recipient households of the elderly long-term care insurance, the sample group was specifically comprised from those with certified ailing family members aged over 65, although the proportion of low-income class was 66 percent, which is lower than among non-recipients without an ailing family member aged over 65.

[Figure III-1] **Proportion of Low-income Class by Household Type**

(Unit: %)



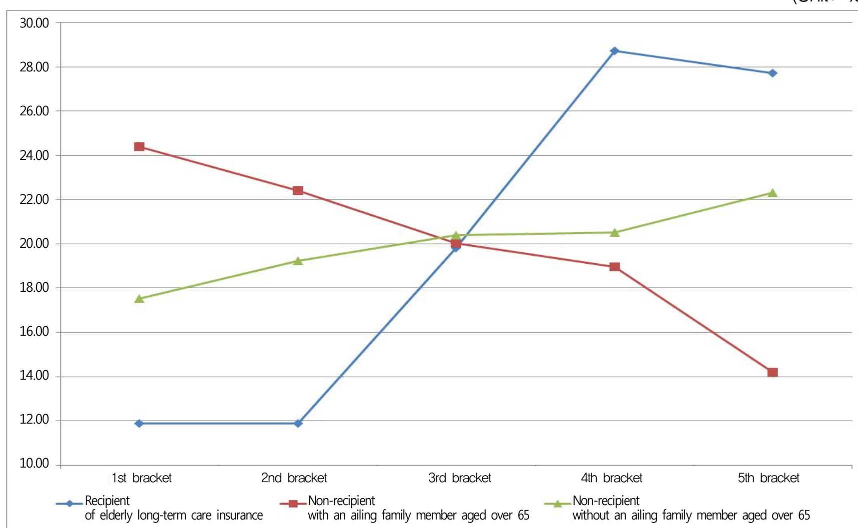
[Figure III-2] below shows proportions of five types of households by income brackets. In regard to non-recipient households with a sick, old family member, the proportions of those in the first and second brackets, which refer to the low-income class, are respectively 24.38 percent and 22.41 percent, while the proportions of those in the fourth and fifth brackets, which refer to the high-income class, are respectively 18.95 percent and 14.22 percent. This demonstrates that families with higher income brackets are less likely to have an ailing senior family member.

With regards to non-recipient households without an ailing family member aged over 65, the proportion of those in the fourth and fifth brackets with higher income are 20.5 percent and 22.32 percent respectively, while the proportion of those in the first and second brackets with lower income are 17.54 percent and 19.25 percent, respectively.

Among recipient households of the elderly long-term care insurance, the proportions of those in the first and second brackets with low income are both 11.88 percent, while the proportion of those in the fourth and fifth brackets

[Figure III-2] Proportion of Households by Household Type and Income Bracket

(Unit: %)



with high income are relatively high at 28.71 percent and 27.72 percent, respectively. This suggests that recipients with experience of the elderlylong-term care insurance can be categorized as a relatively high-income group.

2 Comparison between Recipients and Non-recipients of Elderly Long-term Care Insurance: Using the Method of Propensity Score Matching

The previous section divided non-recipients of the elderly long-term care insurance into three groups, and compared the level of ordinary income and the proportion of low-income class between recipients of the elderly long-term care insurance and non-recipient with an ailing family member aged over 65. This analysis is conducted based on household type, which can be categorized as a non-conditional analysis without controls for household characteristics including the features of the head of family, level of pension income, and possession of private health insurance.

An accurate comparison and analysis of recipient and non-recipient households of the elderly long-term care insurance requires two groups that mostly share common characteristics with the exception of subscription to elderly long-term care insurance. In other words, the comparison of economic conditions must be conducted under the condition that the two groups are similar in the number of family members, features of the household head, presence of a sick, old family member or a family member with a chronic disease or disability, place of residence, etc., with the only difference in the subscription of the elderly long-term care insurance.

〈Table III-4〉 **Current State of Elderly Long-term Care Insurance (Sample)**

Elderly Long-term Care Insurance	Freq.	Percent	Cum.
Non-recipient (0)	1,958	95.09	95.09
Recipient (1)	101	4.91	100
Total	2,059	100	

Therefore, the 21 recipient households of the elderly care service were removed from the sample, reducing the number of households in the sample to 2,059. In the newly-formed sample, the number of recipient households of the elderly long-term care insurance remained at 101 (4.91 percent of sample), while the number of non-recipient households fell to 1,958.

In order to isolate non-recipient households with similar characteristics to recipient households, first of all a probit analysis must be conducted on whether the relevant families are beneficiaries of the elderly long-term care insurance. Through the propensity scores obtained by probit analysis, the two groups can be categorized.

〈Table III-5〉 **Result of Probit Analysis**

	Coef.	Std. Err.	Z	P〉z	[95% Conf. Interval]	
No. of family members	0.1251	0.0534	2.34	0.0190	0.0205	0.2298
Presence of a sick, old family member	0.9881	0.1488	6.64	0.0000	0.6963	1.2798
Presence of a family member with a chronic disease	0.4372	0.4600	0.95	0.3420	–0.4644	1.3389
Presence of a family member with a disability	0.6823	0.1080	6.32	0.0000	0.4706	0.8941
Pension	–0.0001	0.0001	–0.49	0.6260	–0.0003	0.0002
Holders of national health insurance	–0.0172	0.1663	–0.1	0.9170	–0.3432	0.3088
Holders of private health insurance	0.4842	0.1622	2.99	0.0030	0.1663	0.8020
Seoul/metropolitan cities	0.1028	0.1133	0.91	0.3640	–0.1193	0.3249
Age	0.0126	0.0060	2.11	0.0350	0.0009	0.0243
Female	–0.0388	0.1234	–0.31	0.7530	–0.2806	0.2030
High–school education or above	0.2651	0.1946	1.36	0.1730	–0.1162	0.6464
Constant value	–4.3542	0.7119	–6.12	0.0000	–5.7495	–2.9590
Observed value	2059					
Log likelihood	–334.515					

Note: The range of the region of common support is [.0048271, .41655651].

<Table III-5> shows the results of the probit analysis. Generally, interpreting the result of a probit analysis requires the calculation of the marginal effects. However, since the goal of this study is not to analyze determinants of the decision to subscribe to the elderly long-term care insurance, this study features a brief consideration of the relevant coefficient

According to <Table III-5>, households with higher age, a sick senior or a family member with a disability are more likely to have benefitted from the elderly long-term care insurance. Also, households with more family members and those with private health insurance are more likely to be recipients of the elderly long-term care insurance. In contrast, pension income, possession of national health insurance and sex are shown to have no statistically significant effects, which may be explained by the fact that the aforementioned variables are not considered in the grading process of the elderly long-term care insurance.

Upon establishing the two groups through a probit analysis and resulting propensity scores, the groups must then be examined for shared or similar characteristics. According to <Table III-6>, the two groups can be divided into five subgroups based on propensity scores, a process which excludes 535 non-recipient households from the analysis. This implies that the 535 non-recipient households have nothing in common with their recipient counterparts, and once these households are excluded, the balancing property of the two groups is satisfied.

〈Table III-6〉 **Distribution of Propensity Scores of Recipients and Non-recipients**

Range of propensity score	Non-recipient	Recipient	Total
0~0.004827	944	27	971
0.004827~0.05	166	20	186
0.05~0.1	264	38	302
0.1~0.2	49	15	64
0.2~0.4	0	1	1
Total	1,423	101	1,524

<Table III-7> shows the similarities between the two groups in further detail. According to <Table III-7>, the average values are similar between the two in many variables representing recipient households (treated group) and non-recipient households (control group), and the null analysis that the average values of equivalent variables are the same cannot be statistically rejected.

The two similar groups were established through propensity score matching, and <Table III-8> below shows the difference between the two in aspects such as the proportion of low-income class, ordinary income and spending on healthcare. The comparison between 101 recipient households in the sample and 146 non-recipient households randomly selected from all the non-recipient households that have been matched, the former group was lower than the other by 9 percent in the proportion of low-income class; 3.25 million won higher than non-recipients in ordinary income; and 140,000 won higher than non-recipients in terms of healthcare spending.

〈Table III-7〉 **Comparison on Control Variable of Recipients and Non-recipients**

	Mean			t–test	
	Treated	Control	% bias	t	p〉|t|
No. of family members	2.4851	2.4795	0.40	0.72	0.4760
Presence of a sick, old family member	0.9010	0.8916	2.30	0.89	0.3740
Presence of a family member with a chronic disease	0.9901	0.9915	–0.80	0.07	0.9440
Presence of a family member with a disability	0.6337	0.6148	4.10	1.48	0.1410
Pension	99.4060	115.8400	–4.90	–0.39	0.6940
Holders of national health insurance	0.8812	0.8829	–0.50	0.13	0.8950
Holders of private health insurance	0.2475	0.2281	4.80	0.97	0.3330
Seoul/metropolitan cities	0.3465	0.3615	–3.20	–0.15	0.8790
Age	68.6140	68.8710	–2.00	–0.51	0.6120
Female	0.3267	0.3335	–1.40	–0.68	0.4970
High–school education and above	0.1188	0.1070	4.10	1.02	0.3120

〈Table III-8〉 **Comparison of Recipients and Non-recipients (Total)**

	n. treat.	n. contr.	ATT	Std. Err.
Low–income class	101	146	–0.09	0.06
Ordinary income	101	146	324.59	282.80
Spending on healthcare	101	146	14.38	3.27

Note: Nearest Neighbor Matching method (random draw version)

Examining the above analysis in terms of income brackets, fourth and fifth brackets with high income yielded a level of ordinary income and healthcare expenditure at respectively 3.89 million won and 30,000 won higher than non-recipients; meanwhile, first and second brackets with low income yielded a level of ordinary income and healthcare expenditure at respectively 530,000 won and 70,000 won higher than non-recipients. In effect, the difference in ordinary income between recipients and non-recipients was greater among higher income brackets, while the difference in healthcare expenditure became smaller.

〈Table III-9〉 **Comparison of Recipient and Non-recipient (By Income Bracket)**

	n. treat.	n. contr.	ATT	Std. Err.
4th,5th brackets				
Ordinary income	57	55	388.81	452.57
Spending on healthcare	57	55	3.15	7.01
1st,2^{nd}brackets				
Ordinary income	24	45	52.65	58.25
Spending on healthcare	24	45	7.46	2.92

Note: Nearest Neighbor Matching method (random draw version)

To sum up, among the two similar groups, the recipient group shows higher ordinary income than its non-recipient counterpart, and this phenomenon is observed more prominently in higher income brackets. This result suggests that there is ample room to implement the plan for patients' co-payment differentiation in the part of the recipient households of the elderly long-term care insurance.

IV

Measures for Efficiency in Benefits Spending

Since the introduction of long-term care insurance for the elderly in 2008, Korea has expanded the number of beneficiaries of the insurance by continuously lowering eligibility scores. According to the National Health Insurance Service (NHIS), the government is planning to raise the rate of beneficiaries' from 5.8 percent of the elderly population in 2010 to 9.5 percent by 2017 through sustained institutional improvement.[11] As of 2010, the eligibility rates for elderly long-term care insurance in Germany and Japan, which are operated in a similar manner to Korea as a form of social insurance, surpass the eligibility rate in Korea at 13.5 percent and 16.6 percent respectively. Given that South Korea's current aging rate of 10.9 percent is lower than the other two countries, however, its current eligibility rate is not considerably low.

<Table IV-1> shows that the older the patients are, the more they are likely to benefit from the services of the elderly long-term care insurance. This trend was apparent both in home care and facility care services, while the frequency of usage for the high-cost facility service appeared to have a positive

11) This is a plan presented by the National Health Insurance Service ("Practical Health and Welfare Plan," July 2012), which may differ from the official position of the Korean government.

〈Table IV-1〉 **Current Use of Benefit Utilization by Age (2012)**

(Unit: number of people, %)

	Under 65	65 ~ 69	70 ~ 74	75~ 79	80 ~ 84	85 and over
Home care benefits	33,797	36,869	68,776	95,311	97,424	116,581
(Rate of increase)		(12.50)	(86.41)	(38.58)	(2.22)	(19.66)
Facility care benefits	6,930	7,775	18,006	30,253	37,967	56,804
(Rate of increase)		(12.19)	(131.59)	(68.02)	(25.50)	(49.61)

Note: Home care benefits include home–visit care, home–visit bathing, home nursing care, day/night care, short–term respite care, and welfare equipments; facility care benefits consist of care facilities for the elderly, care facilities for the elderly (under previous Act), special care facilities for the elderly (under previous Act), group home for elderly care, elderly care facilities (converted to short–term respite care).
Source: NHIS, *2012 Statistical Yearbook of Long–term Care Insurance for the Elderly*, 2013.

correlation with the age of beneficiaries. Future projections estimate that benefit spending will increase due to population aging and the expenditure for facility care will increase due to the expansion of the super-aged group comprised of seniors over 85 years old. Statistics Korea estimates that the elderly will comprise 15.7 percent of the total population by 2020, and therefore expanding the eligibility rate of elderly long-term care insurance up to 9.5 percent by 2017 is likely pose a considerable burden on national finance in Korea.

Park Hyeong-su and Jeon Byung Mok (2009) estimated that the expenditure on long-term care insurance for the elderly against GDP would increase by 0.87 percent from 0.19 percent in 2009 to 1.06 percent in 2050. Since the estimation omits consideration of the lowered eligibility score for grade three, the prediction can be reached that the actual rise in expenditure may be much greater than the initial estimation when considering that eligibility is set to be expanded over two occasions.

Therefore, the overall fiscal burden is highly likely to increase due to rapid population aging, an increasing share of the super-aged, and the subsequent rise in the demand for long-term care benefits. In line with this concern, this chapter will study measures for greater efficiency and efficacy in fiscal expenditures on the elderly long-term care insurance in terms of value for money.

1 Differentiation of Grants for Long-term Care Institutions

A. Background

While home care and facility care institutions numbered respectively at 6,618 and 1,700 to a total of 8,318 at the time of the system's introduction in 2008, the overall number of long-term care institutions increased by around 1.81 times over four years up to 15,056 in 2012 (10,730 home care institutions, 4,326 facility care institutions).

Due to the rapid expansion in the number of long-term care institutions over such a brief timeframe, it is unlikely that the quality of service in such institutions were under proper control. In the case of Germany, which operates long-term care as a social insurance like Korea, the number of long-term care service providers and care institutions based in local communities surged over the period of 1992-1997, from 5,000 to 11,700 and from 4,300 to 8,000, respectively; however, studies discovered that qualitative control over the long-term care service failed to match its success in quantitative expansion (Kwon Sun-man, 2004).

According to the results of the 2011 NHIS assessment, only 7.1 percent of long-term care institutions fell short of statutory standards for human resources, whereas the evaluation to ensure the sufficient supply of qualified personnel reported 58 percent of institutions as being unsatisfactory and 30.1 percent as falling short of the 60-percent standard for experienced personnel.

The results of the 2010 and 2012 NHIS assessments for home care institutions presented a standard deviation of 13.5 in the 2012 assessment score, which is larger than that of 12.7 in 2010, which suggests that the gap among institutions became wider as time progressed.

The standard deviation in assessment score for facility care institutions decreased by 0.7 percent from 17.0 in 2009 to 16.3 in 2011, which nonetheless remained at a significant level and demonstrated the large gap in service quality between individual institutions.

In 2009, the ratio between institutions with 30 patients or more, 10 to

under 30 patients, and under 10 patients was 54.4: 26.0: 19.5, which had changed by 2011 to 35.8: 28.6: 35.6, thereby showing a drop in the share of institutions with fewer than 10 patients. The assessment results showed that smaller institutions tend to record lower scores, which can be interpreted to represent the market entry of a large number of small-scale institutions providing low-quality services in the long-term care insurance industry.

In response, the NHIS is considering measures to encourage the improvement of grant levels for long-term care institutions, to assess the institutions to provide higher quality services, and to improve services according to the assessment results. The NHIS has evaluated home care and facility care institutions on a biannual basis since 2009, assessing home care institutions in 2010 and 2012, and facility care institutions in 2009, 2011 and 2013.

According to the assessment results, the NHIS divides institutions into five categories from A to E, considering higher scores in each grant type and the proportion of grade is designated as 10 percent for A, 20 percent for B, 40 percent for C, 20 percent for D, and 10 percent for E. The NHIS is required to publicize the details on its webpage, such as assessment results, institutions excluded from the assessment, institutions facing temporary or permanent closure during the assessment, and un-assessed or suspended institutions; it also provides follow-up services to enhance the service quality of institutions in the bottom 30 percent by conducting field visits more than twice a year to verify improvements and notify the assessment results to relevant local governments.

For grade A institutions corresponding to the upper 10 percent in the grant-type grading system, there is an incentive scheme that grants institutions with an extra five percent of NHIS co-payments according to the assessment results of the previous year. However, the extra payment does not apply to cases deemed inappropriate by the assessment committee, such as institutions that submit fabricated data, close down before the payment of the incentive, or incur penalties after the date of public disclosure for the assessment plan.

In short, the incentive system essentially aims to pay the upper 10 percent institutions with an extra five percent along with NHIS payments, according to the assessment results for the previous year. At present, the revised bill is under preparation to reinforce the incentive system in this direction.

The advance administrative notice for the revised bill aims to expand

the range of incentive payment for long-term care institutions from the upper 10 percent to the upper 20 percent. Currently, the upper 10 percent of institutions receive an extra five percent on top of lump-sum payments of the NHIS co-payment, whereas in the future the top 10 percent of institutions will receive an extra three percent while the upper 11 to 20 percent of institutions will receive an extra two percent. In addition, institutions below the top 20 percent that have nevertheless shown substantial improvements since the previous evaluation will receive an incentive of an extra one percent of the NHIS co-payment.

The government is striving to enhance the quality of service provided by care institutions by introducing an incentive system comprised of bonus payments based on the NHIS assessment results. However, the priority concern must be directed towards the sustainability of the current incentive system. To date, the bonus payments policy has incurred no significant issue since the accumulated reserve in long-term care finance had been increasing due to revenues exceeding expenditure. But a number of assessments on elderly long-term care institutions including those of Park Hyeong-su and Jeon Byung Mok (2009) indicate that the NHIS is likely to enter a state of fiscal deficit in the near future due to population aging. Therefore, the bonus payment system is highly unlikely to be sustained.

In addition, the appropriateness of disbursing bonus payments must be considered in light of the greater number of institutions at present. Whereas a state of undersupply may be mitigated through support from the NHIS to increase the supply level, the current problem of excess supply requires in-depth assessment of whether a bonus payment system is an efficient method of qualitative enhancement. Therefore, given the private sector majority in the current market, the priority matter must be to encourage the improvement of standards in the grants service through market competition as opposed to the current system of bonus payments. As evaluated previously, Germany and Japan also induce long-term care service providers to improve their quality of service through private competition.

As a measure to encourage market competition, the NHIS assessment results must be utilized to formulate a scheme to differentiate levels of grant by service type, which are currently paid at a fixed rate. This plan aims to enhance the quality of service by introducing a performance-based reward

system, in which grants are offered to providers based on the quality of service as opposed to the activity of service provision. This approach connotes greater value for money (VFM) and is similar to the concept of pay-for-performance (P4P), which is being implemented in some countries as a means of achieving spending efficiency in the medical insurance sector.[12] The current assessment results by the NHIS classify institutions into five grades from A to E (A grade: 10 percent, B grade: 20 percent, C grade: 40 percent, D grade: 20 percent, E grade: 10 percent), although the NHIS offers grants to institutions irrespective of the quality of services provided and grades of institutions. If payments are made to be commensurate with the institution grade, the overall quality of service is expected to be further improved while also alleviating the fiscal burden. Under the current bonus payment system, uncompetitive institutions may choose to remain in the market by giving up the payment, whereas the proper implementation of the differentiated grant scheme would compel such institutions to withdraw from the market or prohibit them from market entry entirely.

B. Model

The following section will establish a model for the introduction of the differentiated grants system by the NHIS, subsequently examining the spending reduction effect caused by the said change from simulations using accessible data.

First of all, this analysis presupposes that there are two major long-term care institutions in the model to represent each type of long-term care insurance. One is the *h* type institution, which provides high-quality services, and the other is the *l* type offering low-quality services, whereas the quality of service is each represented as q_h and q_1, respectively.

12) The grant differentiation based on performance assessment will induce quality improvement of care institutions, resulting in efficiency in financial spending: differential payment of grants will reduce NHIS's grants spending and cause less competitive institutions to withdraw from the market. This study analyzes the payment system and its effects focusing on financial status.

The NHIS is obligated to offer long-term care institutions with grants excluding the patient co-payment from the total expenses for providing services to eligible recipients. Under the current system, the NHIS provides fixed allowances for services regardless of the service quality. Accordingly, supposing the grant expenditure provided by the NHIS to long-term care institutions as x per each service irrespective of service standards, then the allowance spending paid to the type h and type l institutions are represented as $q_h x$ and $q_l x$, respectively. The level of allowance paid by the NHIS to the two types of institutions, in other words the NHIS co-payment (y_u) in the case of fixed rate amount by type of service is illustrated as follows:

$$y_u \ = \ q_h x \ + \ q_l x$$

On the other hand, in the case where the NHIS pays different rates of grant to the h type and l type institutions, it is supposed that the NHIS pays $x_h \ (= x)$ to the type h which is the same as the current level, and $xl \ (< x_h = x)$ to the type l institution which is below the current level. When the differentiated grants are paid according to service quality, the level of co-payment burden by the NHIS (y_d) to the two institutions are as follows:

$$y_d \ = \ q_h x_h \ + \ q_1 x_l$$

Following the transition from fixed-rate allowance regardless of service quality to differentiated rates in line with service quality, the reduction of benefit spending (s) paid by the NHIS to the two representative types of care institutions is represented as follows:

$$S = y_u - y_d = (q_h x = q_1 x) - (q_h x + q_1 x) = q_1 (x_h - x_l)$$

$$\text{whereby} \ \ x = x_h$$

Thus far, it was assumed that there are only two types of institutions; those offering high-quality services and those offering low-quality services. This

study will consequently expand the number of institutions in the model to *k*. The *k* institutions are divided into the type k_h, which provides high-quality services and the type k_l which provides low-quality services. Supposing that the ratio between the two types are a_h and a_l, respectively, the number of institutions *k* could be described as follows:

$$k = k_h + k_1 = ka_h + ka_l k$$
$$a_h + a_1 = 1, \ 0 \ < \ a_i \ < 1, \quad i = h, l$$

In this case, the numbers of the type *h* and type *l* institutions are ka_h and $k\alpha_l$, respectively. When the NHIS pays grants to the institutions for the identical services regardless of quality in the *k* institutions model, the benefits spending for the type *h* and type *l* institutions are $ka_h q_h x$ and $ka_h a_l x$ and the level of total grant spending (y_u) is as follows:

$$y_u = ka_h q_h x \ + \ ka_l q_l x$$

In the case that the NHIS pays grants at differentiated rates in proportion to the service quality, the grant spending paid by the NHIS to the type *h* and type *l* institutions are represented as $ka_h q_h x$ and $ka_l q_l x$, and total grant spending (Y_d) is as follows:

$$Y_d \ = \ ka_h q_h x_h + ka_l q_l x_l$$

Therefore, following the transition of grants systems from disregarding service quality to reflecting service quality, the decline in grant spending in the *k* long-term care institution model is calculated as follows:

$$S = Y_u - Y_d \ = ka_l q_l (x_h - x_l)$$

As shown in the above equation, when the system transitions to a

differentiated grant scheme, the potential reduction in the NHIS spending depends on the ratio and service quantity between the type *h* and type *l* institutions and the level of differentiated grant by service type when supposing the number of institutions is fixed as *k* in the model. In other words, the smaller the share (a_h) of the type *h* and the higher the share (a_l) of type *l*, the larger the quantity (q_1) of service provided by the type *l*, or the wider the gap between two allowances by service type ($x_A - x_i$), the larger the decline in allowance payment by the NHIS.

Previously, this study examined a simplistic model featuring only two service types (high quality vs. low quality). If this range is expanded to *n* types where *n* represents the number of service quality levels, the potential reduction in the amount of the NHIS co-payment is represented as follows:

$$S_n = k\sum_{1}^{n}= {}_2 a_i q_i (x_A - x_i)$$

Moreover, ($x_A - x_i$) represents the gap between the grant per service (x_A) offered to the institutions which provide highest quality service and allowance payment by the NHIS (x_i).

C. Simulation

In order to implement the grant differentiation model, the NHIS (assessment institution or agency) must evaluate the service quality provided by long-term care institutions in order to categorize them, whereby division into an excess number of categories would incur significant administrative costs, while the opposite has the potential to diminish the impetus for institutions to enhance service quality.

At present, the NHIS uses its assessment results to assign long-term care institutions into five grades ranging from A to E, comprised of ratios of 10 percent, 20 percent, 40 percent, 20 percent, and 10 percent, respectively. In this section, this study will first examine the level of decline in the NHIS

co-payment supposing the existence of two tiers according to the assessment scores. Next, we will review the results using the aforementioned NHIS grading system where co-payment spending is based upon three or five categories of service quality.

Two-tier Grading Model: As discussed above, the decline in allowance spending in the case where institutions are classified into the two levels of high vs. low quality is represented as $S_2 = ka_1q_1(x_h - x_1)$, which would require the identification of the grant gap per service unit between high and low grades $(x_h - x_1)$. When the grant gap per service unit of low grade is set as $\beta(0 < \beta = \frac{x1}{xh} < 1)$ of the high grade, the grant gap per service supply unit based on service quality gap is represented as follows:

$$(x_h - x_1) = (x_h - \beta x_h) = (1 - \beta)x_h$$

In addition, q_1 in the equation $S_2 = ka_1q_1(x_h - x_1)$ refers to the quantity of service provided by a lower-ranking institution, but it is difficult to apply actual data to the simulation with regards to the service quantity. Therefore, in the simulation of this study, all the service quantities provided by both high and low grade institutions are assumed to be equal $(q_h = q_1 = q)$.

Under these assumptions, when institutions are divided into two groups, the level of reduction in NHIS benefit spending due to differentiated grants are as follows:

$$S_s = ka_1q(1 - \beta)x_h = kqx_ha_1(1 - \beta)$$

In the above equation, kqx_h is the total amount of grants provided by the NHIS to all institutions under the current fixed payment scheme regardless of service quality grades, which can be applied using the figures in *the Statistical Yearbook of Long-term Care Insurance for the Elderly*. The said document estimated the total amount of benefits paid by the NHIS as 2,717.7 billion won and the benefits per actual beneficiary as 9,884,724 won[13] in 2012.

Considering the results of the simulation using the applicable data and derived formulas, it can be concluded that the higher proportion of long-term care institutions providing low-quality services and broader gaps in grants offered to the two institution types would result in a greater reduction in the NHIS grants spending following the transition to a differentiated grants system.

<Table IV-2> illustrates that the grants per unit of an institution providing lower quality services remains at 85 percent of its higher counterpart. When the ratio of high grade institutions to low grade institutions is even at 50:50, the decline in grants spending by the NHIS can be calculated as 7.5 percent of the total insurance co-payment by the NHIS, which is large enough to incorporate 20,620 new patients currently without access to long-term care institutions for the elderly.

<Table IV-2> also shows that when the ratio of high level institutions to low level ones is 75:25, the NHIS insurance co-payment declines by 101,914 million won, accounting for 3.75 percent of the current level, which is less than the case where the ratio of high and low quality institutions are 50:50, while the number of additional beneficiaries newly given access to the service also decreased. On the other hand, in the case where the ratio of high level institutions to low level institutions is 25:75 and the grants gap remains the same, NHIS spending dropped by a large margin of 11.25 percent as the equivalent to 305,741 million won, which is a sufficient amount to cover 30,931 additional beneficiaries. To reiterate, a larger number of institutions in lower grades further reduces the NHIS expenditure, which broadens the extent of the reduction.

Signifying the ratio of grants paid to lower grade institutions against their higher grade counterparts for the same service type, β is inversely proportional to the grants gap between high and low grade institutions. As shown in <Table IV-2>, when the ratio of high-grade and low-grade institutions is 50:50, the decline in grants spending amounts 135.885 billion won when β is 0.9, representing a relatively small grant gap, and 271.770 billion won when β is 0.8, reflecting a relatively large grant gap. This suggests that broadening the grant gap in initially establishing the grant plan would result in the greater

13) Average monthly per capita benefits amount 832,132 won x 12 months = 9,985,584 won

reduction of the co-payment burden on the NHIS.

〈Table IV-2〉 **Simulation (1): Two Grades (high vs. low)**

(Unit: hundred million won, number of people)

α	β	S_z	% decrease	No. of additional patients given access to the care service
a_1=0.75 a_2=0.25	0.975	169.86	0.63	1,718
	0.950	339.71	1.25	3,437
	0.925	509.57	1.88	5,155
	0.900	679.43	2.50	6,873
	0.875	849.28	3.13	8,592
	0.850	1,019.14	3.75	10,310
	0.825	1,188.99	4.38	12,029
	0.800	1,358.85	5.00	13,747
a_1=0.5 a_2=0.5	0.975	339.71	1.25	3,437
	0.950	679.43	2.50	6,873
	0.925	1,019.14	3.75	10,310
	0.900	1,358.85	5.00	13,747
	0.875	1,698.56	6.25	17,184
	0.850	2,038.28	7.50	20,620
	0.825	2,377.99	8.75	24,057
	0.800	2,717.70	10.00	27,494
a_1=0.25 a_2=0.75	0.975	509.57	1.88	5,155
	0.950	1,019.14	3.75	10,310
	0.925	1,528.71	5.63	15,465
	0.900	2,038.28	7.50	20,620
	0.875	2,547.84	9.38	25,776
	0.850	3,057.41	11.25	30,931
	0.825	3,566.98	13.13	36,086
	0.800	4,076.55	15.00	41,241

Note: Total benefits amount is 2,717.7 billion won; benefit amount per each beneficiary is 9,985,584 won.

Three-tier Grading Model: This is a model where institutions are classified into the three grades of high (*h*), medium (*m*), and low (*l*). The current NHIS assessment system assigns institutions into five levels; 10 percent for grade A, 20 percent for grade B, 40 percent for grade C, 20 percent for grade D, and 10 percent for grade E. Consideration towards the current classification method may encourage a three-tier plan in which the groups A and B are categorized as high (30%), group C as medium (40%), and groups D and E as low (30%).

When defining a grant gap between high and medium grades $(x_h - x_1)$ as $(1-\beta)$ and the grant gap between high and low grades $(x_h - x_1)$ as double the gap between the high and medium grades, it can be defined as follows: $(x_h - x_m) = 2(1-\beta)$. Applying it to the previously derived formulas, the decline in NHIS grants spending based on the grant differentiation is presented as follows:

$$S_3 = kqx_h(a_m(1-\beta) + a_1 2(1-\beta))$$

Supposing the existence of a three-tier system of long-term care institutions at the ratio of 30:40:30, it was calculated that the decline in total NHIS co-payment spending expanded from 67.943 billion won or 2.5 percent of the current level to 543.540 billion won or 20 percent of the current level as β reflecting relative grants of medium grade against high grade institutions decreases from 0.975 to 0.8.

In particular, when β is 0.9, whereby the grant gap between the high and medium grades, and the high and low grades is differentiated as 90 percent and 80 percent, respectively, the decline in total grant spending amount by the NHIS is calculated as 271,770 million won or 10 percent of the current level. This is an amount large enough to provide elderly long-term care benefits to an additional 27,494 patients without incurring additional expenditures on the NHIS.

〈Table IV-3〉 **Simulation (2): Three Grades (high, medium, low)**

(Unit: hundred million won, number of people)

α	β	S_z	% decrease	No. of additional patients given access to the are service
a_k = 0.3 a_m= 0.4 a_l = 0.3	0.975	679.43	2.50	6,873
	0.950	1,358.85	5.00	13,747
	0.925	2,038.28	7.50	20,620
	0.900	2,717.70	10.00	27,494
	0.875	3,397.13	12.50	34,367
	0.850	4,076.55	15.00	41,241
	0.825	4,755.98	17.50	48,114
	0.800	5,435.40	20.00	54,988
a_k = 0.3 a_m= 0.4 a_l = 0.3	0.975	611.48	2.25	6,186
	0.950	1,494.74	5.50	15,122
	0.925	2,242.10	8.25	22,682
	0.900	2,989.47	11.00	30,243
	0.875	3,736.84	13.75	37,804
	0.850	4,484.21	16.50	45,365
	0.825	5,231.57	19.25	52,926
	0.800	5,978.94	22.00	60,487
a_k = 0.3 a_m= 0.4 a_l = 0.3	0.975	883.25	3.25	8,936
	0.950	1,766.51	6.50	17,871
	0.925	2,649.76	9.75	26,807
	0.900	3,533.01	13.00	35,742
	0.875	4,416.26	16.25	44,678
	0.850	5,299.52	19.50	53,613
	0.825	6,182.77	22.75	62,549
	0.800	7,066.02	26.00	71,484

Note: Total benefit amount is 2,717.7 billion won, benefit amount per actual patient is 9,985,584 won.

〈Table IV-4〉 **Simulation (3): Five Grades (A, B, C, D, E)**

(Unit: hundred million won, number of people)

	β	S_z	% decrease	No. of additional patients given access to the care service
$a_A=0.1$ $a_B=0.2$ $a_C=0.4$ $a_D=0.2$ $a_E=0.1$	0.975	1,358.85	5.00	13,747
	0.950	2,717.70	10.00	27,494
	0.925	4,076.55	15.00	41,241
	0.900	5,435.40	20.00	54,988
	0.875	6,794.25	25.00	68,735
	0.850	8,153.10	30.00	82,482
	0.825	9,511.95	35.00	96,229
	0.800	10,870.80	40.00	109,976
$a_A=0.1$ $a_B=0.2$ $a_C=0.4$ $a_D=0.2$ $a_E=0.1$	0.975	1,562.68	5.75	15,809
	0.950	3,125.36	11.50	31,618
	0.925	4,688.03	17.25	47,427
	0.900	6,250.71	23.00	63,236
	0.875	7,813.39	28.75	79,045
	0.850	9,376.07	34.50	94,854
	0.825	10,938.74	40.25	110,663
	0.800	12,501.42	46.00	126,472
$a_A=0.1$ $a_B=0.2$ $a_C=0.4$ $a_D=0.2$ $a_E=0.1$	0.975	1,630.62	6.00	16,496
	0.950	3,261.24	12.00	32,993
	0.925	4,891.86	18.00	49,489
	0.900	6,522.48	24.00	65,985
	0.875	8,153.10	30.00	82,482
	0.850	9,783.72	36.00	98,978
	0.825	11,414.34	42.00	115,475
	0.800	13,044.96	48.00	131,971

Note: Total benefit amount is 2717.7 billion won; care cost per patient in a single-patient care room is 9,985,584 won.

Examining two cases where the ratio of high, medium, low grade institutions is 20:50:20 and 20:30:50, it is found that a larger share of low-grade institutions leads to a bigger reduction in the NHIS expenditures.

Five-tier Grading Model: When the model is based on the current 5 grades system of A to E assessed and designated by NHIS, and the grant gaps among grades increase by the same level, the decline in NHIS grants spending according to the grant differentiation can be expanded as the following.

$$S_5 = kqx_h\{a_B(1-\beta) + a_C 2(1-\beta) + a_D 3(1-\beta) + a_E 4(1-\beta)\}$$

First of all, the simulation is conducted by adopting the current standard of five grades: 10 percent for grade A, 20 percent for grade B, 40 percent for grade C, 20 percent for grade D, 10 percent for grade E. In the simulation, as β which reflects grant gap between grades increases from 0.80 to 0.975, the decline in benefits spending appeared to increase from 135,885 million won or 5 percent of the current amount to 1,087.08 billion won or 40 percent.

When the ratios of grants level of lower-grade institutions are differentiated respectively into 90 percent, 80 percent, 70 percent, 60 percent in comparison to grade A institutions, the total decline in grants spending is estimated to be 543.54 billion won or 20 percent of the current spending amount. This suggests that 54,988 patients could be incorporated as new beneficiaries without additional input of financial resources by applying the differentiated grants scheme to the current program.

D. Considerations for Introduction of the System

This chapter reviewed the measures for grant differentiation among long-term care institutions according to service quality, using the results of the NHIS assessment. In order to actually implement such measures, institutions subject to the assessment must first be led to trust the evaluation. In case the subjects of assessment reject the assessment results, grant differentiation based on assessment results is unlikely to be introduced due to resistance from the

institutions. In addition, if the assessment is not based on a fair and objective system, there is a risk that outstanding service providers may withdraw from the market while leaving behind sub-par competitors, which runs counter to the original intention of the policy.

Furthermore, there is a need to review the validity of the current level of premiums and grants. If the current grant levels are unrealistically low, the plan to differentiate grants while designating the current level as the maximum ceiling is highly unlikely to be introduced due to resistance from the care service providers. In this case, an alternative option may be to increase premiums and grants at a differentiated rate in accordance with assessment results.

The above plan will also require the transition from relative to absolute standards when the overall standard among institution has been adjusted upwards and stabilized. The reason is that the operation of the plan will drive out inferior institutions from the market, leaving superior institutions to occupy the majority. Such a case would require the transition to an alternative policy such as differentiated payment for institutions unable to meet certain standards based on absolute terms.

2 Differentiation of Patients' Co-payment Ratio

A. Background

Since the introduction of the elderly long-term care insurance, the number of beneficiaries and the volume of usage have been consistently on the rise. The actual number of patients granted the benefit on more than one occasion was 291,389 in 2009 at the initial stage of its introduction, but increased by 26.93 percent to 369,857 in 2012. During this same period, the number of patient-days increased by 57.07 percent which is more than double the increase rate of actual number of patients, and despite the decrease in the benefit rate, the benefit amount also expanded by 56.47 percent from 1,736.9 billion won in 2009 to 2,717.7 billion won in 2012.

〈Table IV-5〉 **Trends in Benefits of Long-term Care Insurance for the Elderly**

	2008	2009	2010	2011	2012
Actual no. of patients (persons)	149,656	291,389	348,561	360,073	369,857
Patient days (10 thousand days)	1,225	5,115	7,357	7,938	8,034
Service expenses (100 million won)	4,808	19,718	27,465	29,691	31,256
Benefit amount (100 million won)	4,268	17,369	24,023	25,882	27,177
Benefit ratio (%)	88.8	88.1	87.5	87.1	87.0

Source: 2012 *Statistical Yearbook of Long-term Care Insurance for the Elderly*, Summary.

According to <Table IV-5>, the number of patient days increased from 176 in 2009 to 217 in 2012, and service expense and benefit amount per patient increased by 24.88 percent and 23.27 percent, from 6.77 million and 5.96 million won in 2009 to 8.45 million and 7.35 million won, respectively.

According to the 2012 data for benefit utilization by income level (eligibility), the average annual patient days per patient were found to be 204.31 for general recipients who pay the highest co-payment, while basic livelihood security recipients who are exempt from the co-payment posted 231.62 days as the longest average period, which is 46.47 days more than the recipients eligible for reductions as the group showing the least utilization rate.

The level of co-payment for the recipients eligible for reduction and medical aid were 8.77 and 8.55, respectively, which are low when compared to that of general recipients at 17.30, but it shows lower service usage level than general recipients. This suggests that the income level is more likely to affect the volume of care more than a low level of patients' co-payment for recipients eligible for reduction and medical aid.

〈Table IV-6〉 **Review of Benefits by Income Level (Eligibility)**

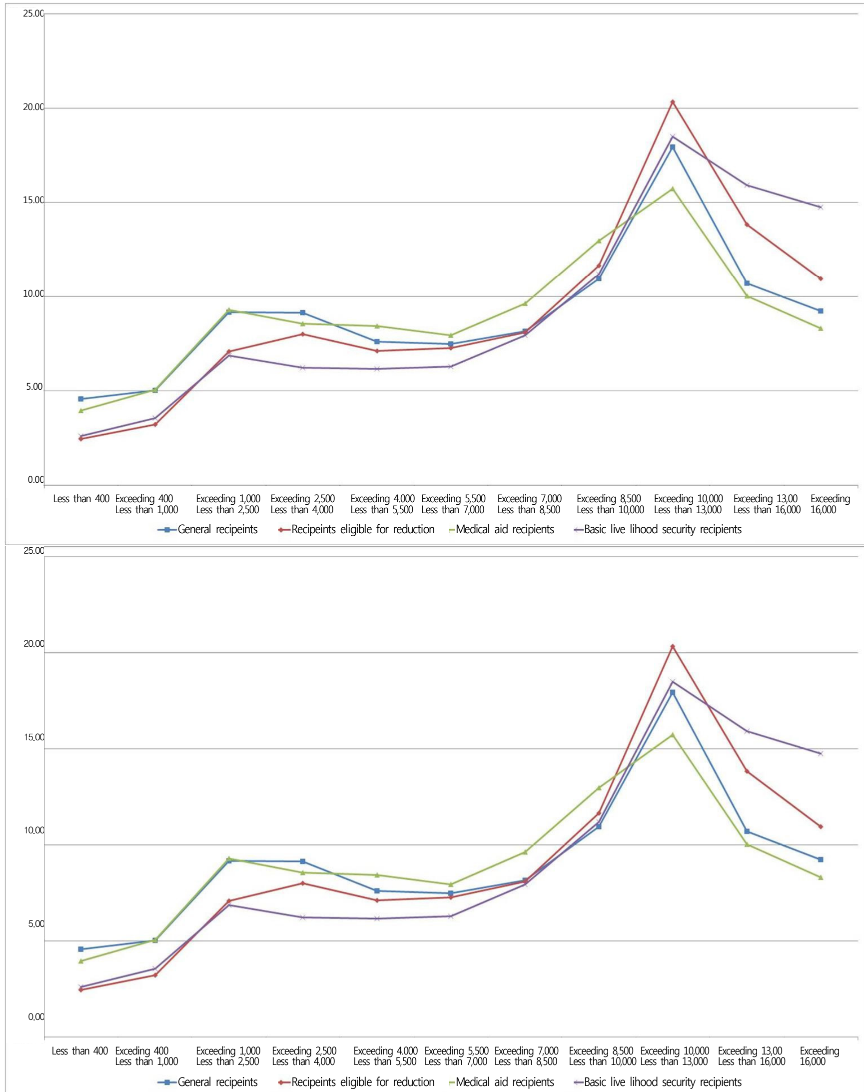
	General	Eligible for reduction	Medical aid	Basic livelihood security
No. of patient-days (days)/ Actual no. of patients (persons)	204.31	185.14	191.08	231.62
Male	189.67	174.45	173.73	216.30
Female	210.73	188.42	199.85	236.61
Total service expenses (thousand won)/ Actual number of patients (persons)	7,844.70	7,190.95	7,407.14	9,468.80
Male	6,985.70	6,495.37	6,658.24	8,733.79
Female	8,221.46	7,403.97	7,785.66	9,708.20
Total care expenses (thousand won)/ Actual number of patients (persons)	6,487.34	6,560.25	6,773.96	9,468.80
Male	5,806.01	5,938.16	6,097.88	8,733.79
Female	6,786.17	6,750.77	7,115.67	9,708.20
Patients' co-payment rate (%)	17.30	8.77	8.55	0.00
Male	16.89	8.58	8.42	0.00
Female	17.46	8.82	8.61	0.00

Source: *2012 Statistical Yearbook of Long-term Care Insurance for the Elderly.*

In the case of basic livelihood security recipients, not only the number of patient days but also service expense and benefit amount per patient appear to be higher than those of general recipients. The average service expenses per patient is 7,480,900 won for general recipients and those eligible for reduction and medical aid, which is 1,987,900 won higher for basic livelihood security recipients facing 9,468,800 won for the same type of expenses. Considering that this phenomenon also occurs within each grade, it could be inferred that patient days and care expenses of basic livelihood security recipients are higher despite similar health status, because they are exempt from patients' co-payment.

[Figure Ⅳ-1] Distribution of Care Expenses by Eligibility Requirements (First-half 2012, Second-half 2011)

(Unit: thousand won, %)



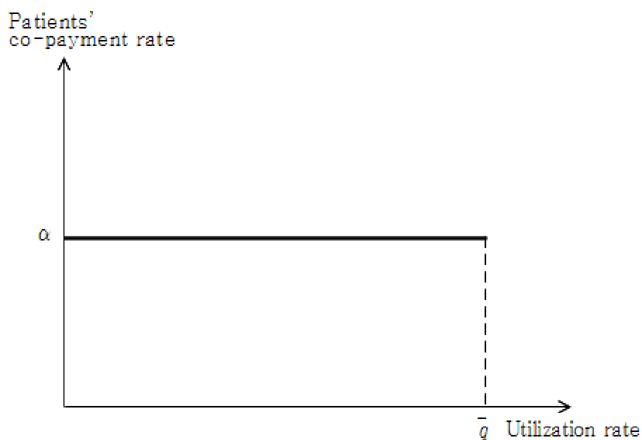
Source: *Statistical Yearbook of Long-term Care Insurance for the Elderly* (2011, 2012).

The distribution of total care expenses by eligibility requirements shows that care expenses spending was high with regards to recipients eligible for reduction and medical aid facing a relatively low level of patients' co-payment. The care expense bracket of between 8.5 million and 10 million won shows the highest distribution of 12.84 percent, 15.10 percent, and 12.00 percent respectively for general recipients, those eligible for reduction, and those receiving medical aid in 2011, but the bracket between 10 million and 13 million won occupied the greatest share for all eligibilities in 2012. In other words, data from the recent two years indicates that maximum expenditure sections for gross care expenses are increasing in all eligibilities.

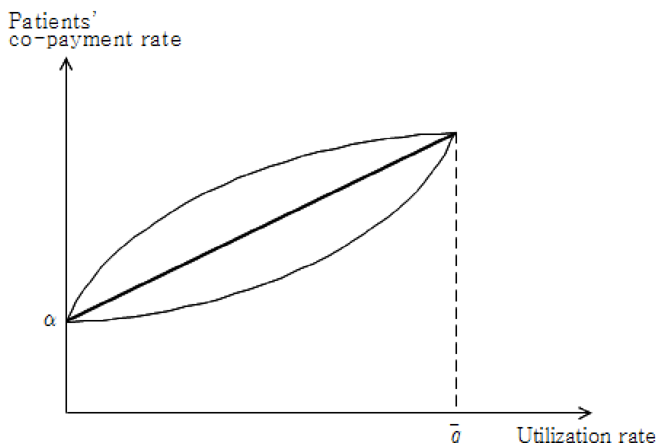
In addition, the share of basic livelihood security recipients facing no patients' co-payment appears to be higher in the over 10 million won bracket as of 2011 and over 13 million won bracket as of 2012 when compared to the counterparts in other income levels, which can be interpreted as the cost effect on the rate of utilization.

Under the current system applying a flat rate regardless of the utilization rate, patients face little incentive to lower service utilization. The current system is represented as in the following [Figure IV-2].

[Figure IV-2] **Fixed-rate Co-payment (Current System)**



[Figure IV-3] **Differentiation of Patients' Co-payment Ratio: Linear**



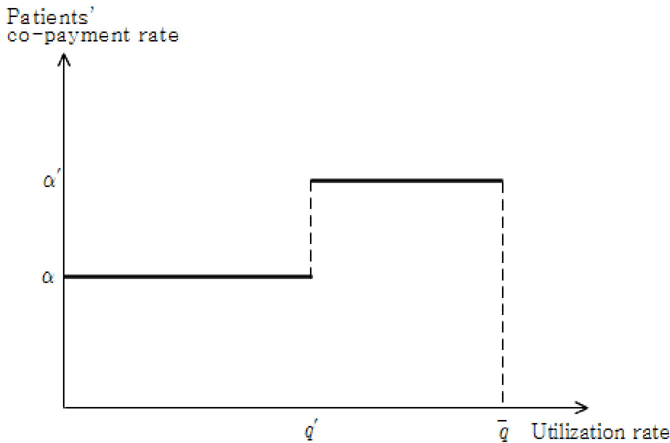
Therefore, an alternative policy might consider decreasing the utilization rate by allowing recipients to perceive the linear and directly experienced increase in the patients' co-payment in line with increasing usage. ([Figure IV-3]).

However, changing the rates of patients' co-payment per unit of utilization is difficult to implement due to substantial administrative costs. As a result, a measure to differentiate patients' co-payment by section of usage could be a more realistic alternative. The following sections will review the measures to differentiate patients' co-payment ratio into two-tier and three-tier systems.

B. Model

Two-tier System of Patients' Co-payment: Featuring differentiated patients' co-payment ratios, this model assumes the existence of two economic agents (k_b, k_g) that do not face income constraints in using benefits under the current ratio. In the case of general recipients, they are supposed to be capable of consuming the maximum available quantity ($\bar{q}$) under the current level k_b

[Figure IV-4] Differentiation of Patients' Co-payment Ratio: Two-tier System



is compelled to consume the maximum quantity of service irrespective of patients' co-payment due to relatively poor health conditions, and the relatively better health condition of k_g allows the conversion of a certain portion of care service-related consumption to other forms of consumption in case of a further increase of the patients' co-payment ratio (a).

When the service price is p, spending incurred by the utilization of benefits by the two economic subjects is the same as represented by $pa\bar{q}$ under the current patients' co-payment ratio. Expanding the model to the economy where the numbers of k_b and k_g are represented as K_b and K_g, respectively, the gross patients' co-payment (A_u) and provider co-payment (Gu) are described as follows:

$$A_u = K_b pa\bar{q} + K_g pa\bar{q}$$

$$G_u = K_b p(1-a)\bar{q} + K_g p(1-a)\bar{q}$$

The following part will review the case where patients' co-payment ratios are differentiated according to utilization. It is assumed that when utilization

is under, patients' co-payment ratio is a, which is the same as the current level, and when utilization is greater than q', patients' co-payment ratio increases to $a(> a)$. Suppose that the relatively unhealthy k_b must continue consuming q' service while the relatively healthy K_g reduces utilization to the level of q'. In this case, the gross patients' co-payment (A_2) and NHIS co-payment (G_2) are represented as follows:

$$A_2 = K_b\{paq + pa'(\bar{q} - q') + K_g pa'\}$$

$$G_2 = K_b\{p(1-a)q' + p(1-a')(\bar{q} - q')\} + K_g p(1-a)q'$$

If patients' co-payment ratios are differentiated into the two tiers of a and a', the relative prices faced by users for the long-term care service and other goods will change to an excess of specific utilization rates. In this respect, the model in this study is established on the assumption that unhealthy recipients consistently use the benefits service despite the increased relative price while healthy subjects convert their consumption to other goods whose relative prices are decreased. As a result, spending burden assumed by the NHIS is relieved due to a decrease in overall benefit utilization thanks to the two-tier differentiation of patients' co-payment, which is calculated as follows:

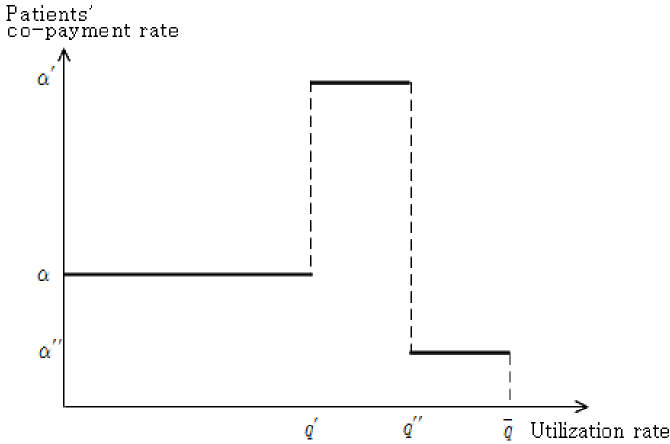
$$S_2 = G_u - G_2 = K_b p(a' - a)(\bar{q} - q') + K_g p(1-a)(\bar{q} - q')$$

Three-tier System of Patients' Co-payment: In Part D of Medicare, the U.S. social insurance system, the coverage gap (also called the "doughnut hole") acts to reduce the utilization of services by recipients (CMS, 2013).

From this point, measures will be reviewed to differentiate patients' co-payment ratios into three tiers by applying the coverage gap in Part D to the elderly long-term care insurance system in Korea.

The rate of patients' co-payment is set as the current level of a when utilization is less than q', and the rate is set as a', which is considerably high, in the section between q'' or more and under q''. When the ratio is supposed

[Figure IV-5] Differentiation of Patients' Co-payment Ratio: Three-tier System



to decrease further from the current level of a to a'' in the over q'' section, it is illustrated as [Figure IV-5].

Supposing that the unhealthy k_b uses the $\overline{q}$ amount of service despite a high patients' burden ratio irrespective of changes in the ratio, while the relatively healthy k_g uses q', the gross patients' co-payment amount (A_3) and NHIS co-payment amount (G_3) are calculated as follows:

$$A_3 = K_b\{paq' + pa'(q'' - q') + pa''(\overline{q} - q'')\} + K_g paq'$$

$$G_3 = K_b\{p(1-a)q' + p(1-a')(q'' - q') + p(1-a'')\overline{q} - q'')\}$$
$$+ K_g p(1-a)q'$$

The decline in the NHIS's burden followed by the institutional shift to the three-tier differentiation of patients' co-payment is calculated as follows:

$$S_3 = G_U - G_3 = K_b p\{a(q' - \overline{q}) + a'(q'' - q') + a''(\overline{q} - q'')\}$$
$$+ K_g p(1-a)(\overline{q} - q')$$

First of all, since the second term in S_3 representing relatively healthy beneficiaries always has a positive value, this implies that relatively healthy beneficiaries reduce the benefit spending under the three-tier patients' co-payment plan. In contrast, the signs in the first term, which represent relatively unhealthy beneficiaries, depend on q' and q'', which can be confirmed by the partial differential equation.

$$\frac{\partial S_3}{\partial q'} = K_1 p(a - a') - K_2 p(1 - a) < 0$$

$$\frac{\partial S_3}{\partial q''} = K_1 p(a' - a'') > 0$$

In other words, smaller values for q' and the larger q'' equates to a larger decline in the spending burden for the NHIS under the three-tier differentiation system of patients' co-payment ratio. This also implies that a wider coverage gap as a section with higher share of patients' co-payment results in a greater decline in benefit spending by the NHIS.

Whereas the three-tier differentiation scheme has advantages over the two-tier scheme in that economic subjects transparently reveal their preference for benefit utilization considering their health status, it has an implicit disadvantage that it is not easy to establish policy variables such as optimal patients' co-payment rates a' and a'' and the utilization standards q' and q''.

C. Simulation

As a system such as the aforementioned has never been implemented in South Korea, it is impossible to estimate the relevant parameters such as response and elasticity of beneficiaries following the implementation of the plan. For this reason, a simulation will be conducted using the two previously-established models and available statistical data. It is more likely that the recipients eligible for reduction, medical aid, and basic livelihood security will limit their use of benefit services not because of their health status but because of the income constraint. Therefore, the patients' co-payment differentiation

should be preferentially applied to general recipients. Since the differentiation of patients' co-payment has the potential to worsen the health status of grade one and two recipients, whose health is generally in bad condition, it is desirable to preferentially consider grade three general recipients. As a result, the simulations in this study mainly focus on grade three general recipients.

Variables to consider for the simulation include the number of relatively unhealthy patients (K_b), relatively healthy patients (K_g), current rate for patients' co-payment (a), increase of patients' co-payment ratio above a specified utilization rate (a'), utilization levels acting as a standard of patients' co-payment ratio increase (q', q''), and service premium (q).

According to the 2011 Statistical Yearbook, patients' co-payment ratio ($a = 1 - \frac{co-payment\ by\ NHIS}{gross\ amount}$) for grade three general recipients is 16.31 percent, and the average utilization ($\bar{q} = \frac{patient\ days}{actural\ number\ of\ patient}$) is 184.68 days. While the maximum utilization volume is used in the above-mentioned model, it is difficult to identify the distribution of utilization by the recipients with data from the Statistical Yearbook. However, it is estimated that since current average use of service exceeds 180 days, it is more than enough to conduct the simulation. The insurance premium ($p = \frac{Gross\ amount}{patient\ days}$) is calculated as 34,050 won considering daily expenses. In addition, the patients' co-payment rates (a'), which will increase after surpassing a certain utilization volume, and the utilization standard (q'), are policy variables applying random figures in the simulation. Since the number of patients by health condition (K_b, K_g) is not identified, the distribution of the number will be inferred and applied based on available data in the following process.

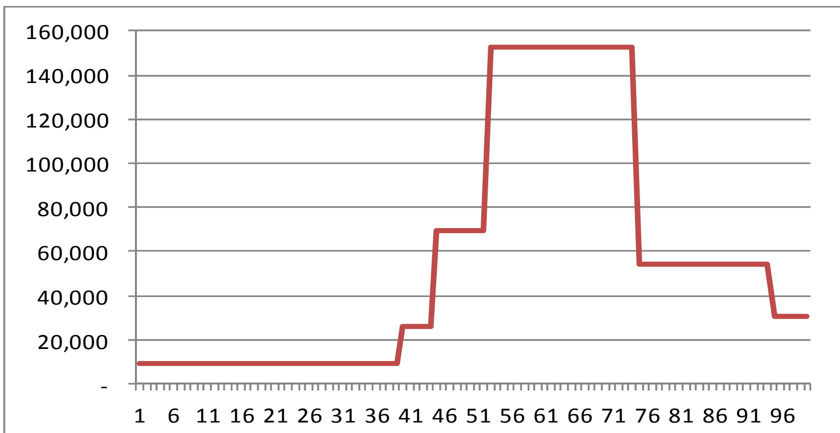
If patients attain an eligibility score of 53 or more and under 75 in the assessment of LCTI, they are classified as grade three recipients. In case the data on the distribution of number of patients qualified as grade three are available, more elaborate analyses could be conducted. However, since currently available data are the number of eligible beneficiaries by grade, the simulation will be performed based on the data.

The distribution of qualified grade 3 recipients with scores between 53 or more and under 75 shows a moderate rightward lean in the general beneficiaries' arrangements ranging from grade one (95 or more), grade two (between 75 and 95), grade three (between 53 and 75), others A (between 45 and 52), to others B (between 40 and 45) and others C (under 40) in [Figure IV-6]. Therefore, the difference would be negligible in assuming the distribution of recipients qualified as grade three as a symmetrical distribution including uniform distribution.

The actual number of patients among grade three general recipients in 2011 was found to be 183,831. In this case, uniform and bell-shaped distributions could be taken into account. When assuming uniform distribution, it may be surmised that 8,356 (8,355.95) patients exist in each section. The bell-shaped distribution is typically represented as normally distributed continuous variables, which illustrate distributions demonstrating the set of 34.1 percent from mean μ to 1 standard deviation 1σ, 13.6 percent from 1 σ to 2σ, 2.1 percent from 2σ to 3σ, and 0.1 percent from 3σ or more. Since the distributions by score are not continuous variables, it will be applied in the simulation by assuming that score ranges of 53-55 and 74-76 have 5,515 patients or 3 percent of the

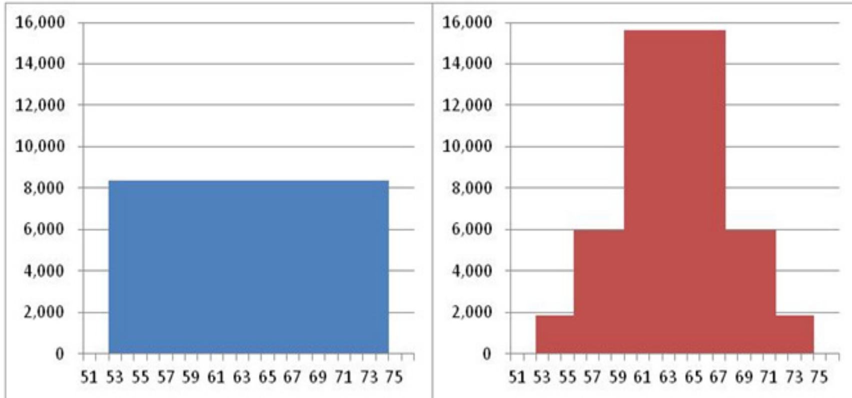
[Figure IV-6] **Review of General Recipients by Eligibility Score**

(Unit: number of people)



[Figure Ⅳ-7] **Assumed Distribution on the Actual Number of Patients among Grade Three General Recipients**

(Unit: number of people)



total recipients, respectively; those of 56-59 and 68-71 have 23,898 or 13 percent, respectively; and those of 60-63 and 64-67 have 62,503 which account for 34 percent, respectively.

Two-tier Patients' Co-payment Differentiation Plan: The simulation regarding two-tier differentiation is conducted separately in the cases of uniform distribution and bell-shaped distribution. The simulation will be conducted by randomly establishing the shares of two types of patients who differ in health conditions.

The policy variables a and $\bar{q}$ used for two-tier differentiation plan are calculated as 0.1631 and 184.68 days according to the Statistical Yearbook, where the policy variable a' is identified as 0.20, 0.24, 0.29, and 0.33, respectively, which are 1.25, 1.50, 1.75, and 2.00 times of the current level. The other policy variable q' is established as 166.21, 156.98, 147.74, 138.51, and 129.28 days which are 0.90, 0.85, 0.80, 0.75, and 0.70 times of $\bar{q}$, respectively.

〈Table IV-7〉 **(Uniform Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 36.36%, k_g = 63.64%)**
Score 67-74: unhealthy; 53-66: healthy

(Unit: persons, %, thousand won)

K_b	K_a	a'	q'	S(2)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
Utilization standard is 90% of current level							
66,847.64	116,983.36	0.20	166.21	63,279,133.68	6.54	13,360.03	7.27
66,847.64	116,983.36	0.24	166.21	64,993,158.11	6.72	13,721.91	7.46
66,847.64	116,983.36	0.29	166.21	66,707,182.54	6.90	14,083.79	7.66
66,847.64	116,983.36	0.33	166.21	68,421,206.98	7.07	14,445.67	7.86
Utilization standard is 85% of current level							
66,847.64	116,983.36	0.20	156.98	94,918,700.53	9.81	21,218.87	11.54
66,847.64	116,983.36	0.24	156.98	97,489,737.17	10.08	21,793.62	11.86
66,847.64	116,983.36	0.29	156.98	100,060,773.82	10.34	22,368.37	12.17
66,847.64	116,983.36	0.33	156.98	102,631,810.46	10.61	22,943.12	12.48
Utilization standard is 80% of current level							
66,847.64	116,983.36	0.20	147.74	126,558,267.37	13.08	30,060.07	16.35
66,847.64	116,983.36	0.24	147.74	129,986,316.23	13.44	30,874.30	16.79
66,847.64	116,983.36	0.29	147.74	133,414,365.09	13.79	31,688.53	17.24
66,847.64	116,983.36	0.33	147.74	136,842,413.95	14.15	32,502.76	17.68
Utilization standard is 75% of current level							
66,847.64	116,983.36	0.20	138.51	158,197,834.21	16.35	40,080.09	21.80
66,847.64	116,983.36	0.24	138.51	162,482,895.29	16.80	41,165.73	22.39
66,847.64	116,983.36	0.29	138.51	166,767,956.36	17.24	42,251.37	22.98
66,847.64	116,983.36	0.33	138.51	171,053,017.44	17.68	43,337.01	23.57
Utilization standard is 70% of current level							
66,847.64	116,983.36	0.20	129.28	189,837,401.05	19.62	51,531.55	28.03
66,847.64	116,983.36	0.24	129.28	194,979,474.34	20.16	52,927.37	28.79
66,847.64	116,983.36	0.29	129.28	200,121,547.63	20.69	54,323.19	29.55
66,847.64	116,983.36	0.33	129.28	205,263,620.93	21.22	55,719.01	30.31

〈Table IV-8〉 **(Uniform Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 50.00%, k_g = 50.00%) Score 64-74: unhealthy; 53-63: healthy**

(Unit: persons, %, thousand won)

K_b	K_a	a'	q'	S(2)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
Utilization standard is 90% of current level							
91,915.50	91,915.50	0.20	166.21	50,729,369.43	5.24	10,710.42	5.83
91,915.50	91,915.50	0.24	166.21	53,086,153.03	5.49	11,208.00	6.10
91,915.50	91,915.50	0.29	166.21	55,442,936.62	5.73	11,705.59	6.37
91,915.50	91,915.50	0.33	166.21	57,799,720.21	5.97	12,203.17	6.64
Utilization standard is 85% of current level							
91,915.50	91,915.50	0.20	156.98	76,094,054.15	7.87	17,010.66	9.25
91,915.50	91,915.50	0.24	156.98	79,629,229.54	8.23	17,800.94	9.68
91,915.50	91,915.50	0.29	156.98	83,164,404.93	8.60	18,591.23	10.11
91,915.50	91,915.50	0.33	156.98	86,699,580.31	8.96	19,381.51	10.54
Utilization standard is 80% of current level							
91,915.50	91,915.50	0.20	147.74	101,458,738.87	10.49	24,098.44	13.11
91,915.50	91,915.50	0.24	147.74	106,172,306.05	10.98	25,218.00	13.72
91,915.50	91,915.50	0.29	147.74	110,885,873.23	11.46	26,337.57	14.33
91,915.50	91,915.50	0.33	147.74	115,599,440.42	11.95	27,457.13	14.94
Utilization standard is 75% of current level							
91,915.50	91,915.50	0.20	138.51	126,823,423.59	13.11	32,131.25	17.48
91,915.50	91,915.50	0.24	138.51	132,715,382.56	13.72	33,624.01	18.29
91,915.50	91,915.50	0.29	138.51	138,607,341.54	14.33	35,116.76	19.10
91,915.50	91,915.50	0.33	138.51	144,499,300.52	14.94	36,609.51	19.91
Utilization standard is 70% of current level							
91,915.50	91,915.50	0.20	129.28	152,188,108.30	15.73	41,311.61	22.47
91,915.50	91,915.50	0.24	129.28	159,258,459.08	16.46	43,230.86	23.52
91,915.50	91,915.50	0.29	129.28	166,328,809.85	17.19	45,150.12	24.56
91,915.50	91,915.50	0.33	129.28	173,399,160.63	17.92	47,069.37	25.60

In the first simulation <Table IV-7>, the score section from 53 to 74 in grade three is divided into two sections of 53-66 and 67-74, where the relatively healthy type of k_g occupies the majority. In other words, it is assumed that there are 66,847 relatively unhealthy patients of type k_b, which comprise 36.36 percent of all recipients, and 116,983.36 healthy k_g types, which comprise 63.64 percent.

Under the aforementioned assumptions, when identical benefits amount within same grades for grade three recipients are differentiated into two tiers based on 156.98 patient days comprising 85 percent of the current level of usage, the decline in NHIS spending is calculated to increase from 94.9 billion won to 102.6 billion won as the patients' additional co-payment ratio a' grows from 20 percent to 33 percent. This is an amount large enough to provide benefits for 21,218 to 22,943 patients who have been previously excluded from the eligibility.

The simulation results shown in <Table IV-8> are calculated under the assumption that the ratio of healthy vs. unhealthy recipients is 50:50. In case utilization standard is 85 percent of the current level, as the patients' co-payment rate increases from 20 percent to 33 percent, the decline of NHIS spending expands from 76.1 billion to 86.7 billion won. In this case, the scale of decline is smaller than that of health vs. unhealthy recipient's ratio of 33.36:63.64. This implies that a greater number of unhealthy recipients lead to the higher utilization of benefits, thereby resulting in heavier burdens to NHIS's benefit spending.

<Table IV-9> shows the situation in which unhealthy recipients amount to 68.18 percent. In this case, the reduction in NHIS spending is smaller than those of <Table IV-7> and <Table IV-8>. This could be interpreted as relatively healthy recipients reducing utilization in response to the institutional changes.

The simulations illustrated from <Table IV-10> to <Table IV-13> are conducted under the assumption that rating three general recipients are distributed in bell-shape, which shows similar results to uniform distribution.

〈Table IV-9〉 **(Uniform Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 68.18%, k_g = 31.82%) Score 60-74: unhealthy; 53-59: healthy**

(Unit: persons, %, thousand won)

K_b	K_a	a'	q'	S(2)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
Utilization standard is 90% of current level							
125,339.32	58,491.68	0.20	166.21	33,996,350.43	3.51	7,177.60	3.90
125,339.32	58,491.68	0.24	166.21	37,210,146.24	3.85	7,856.12	4.27
125,339.32	58,491.68	0.29	166.21	40,423,942.05	4.18	8,534.65	4.64
125,339.32	58,491.68	0.33	166.21	43,637,737.85	4.51	9,213.17	5.01
Utilization standard is 85% of current level							
125,339.32	58,491.68	0.20	156.98	50,994,525.65	5.27	11,399.72	6.20
125,339.32	58,491.68	0.24	156.98	55,815,219.36	5.77	12,477.37	6.79
125,339.32	58,491.68	0.29	156.98	60,635,913.07	6.27	13,555.03	7.37
125,339.32	58,491.68	0.33	156.98	65,456,606.78	6.77	14,632.68	7.96
Utilization standard is 80% of current level							
125,339.32	58,491.68	0.20	147.74	67,992,700.87	7.03	16,149.60	8.79
125,339.32	58,491.68	0.24	147.74	74,420,292.48	7.69	17,676.28	9.62
125,339.32	58,491.68	0.29	147.74	80,847,884.09	8.36	19,202.96	10.45
125,339.32	58,491.68	0.33	147.74	87,275,475.71	9.02	20,729.64	11.28
Utilization standard is 75% of current level							
125,339.32	58,491.68	0.20	138.51	84,990,876.08	8.79	21,532.80	11.71
125,339.32	58,491.68	0.24	138.51	93,025,365.60	9.62	23,568.37	12.82
125,339.32	58,491.68	0.29	138.51	101,059,855.12	10.45	25,603.94	13.93
125,339.32	58,491.68	0.33	138.51	109,094,344.63	11.28	27,639.52	15.04
Utilization standard is 70% of current level							
125,339.32	58,491.68	0.20	129.28	101,989,051.30	10.54	27,685.03	15.06
125,339.32	58,491.68	0.24	129.28	111,630,438.72	11.54	30,302.19	16.48
125,339.32	58,491.68	0.29	129.28	121,271,826.14	12.54	32,919.36	17.91
125,339.32	58,491.68	0.33	129.28	130,913,213.56	13.53	35,536.52	19.33

〈Table IV-10〉 (Bell-shaped Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 9.50%, k_g = 90.50%) Score 71-74: unhealthy; 53-59: healthy

(Unit: persons, %, thousand won)

K_b	K_a	a'	q'	S(2)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
Utilization standard is 90% of that of current level							
17,463.95	166,367.06	0.20	166.21	88,002,169.26	9.10	18,579.77	10.11
17,463.95	166,367.06	0.24	166.21	88,449,958.14	9.14	18,674.31	10.16
17,463.95	166,367.06	0.29	166.21	88,897,747.02	9.19	18,768.85	10.21
17,463.95	166,367.06	0.33	166.21	89,345,535.90	9.24	18,863.39	10.26
Utilization standard is 85% of that of current level							
17,463.95	166,367.06	0.20	156.98	132,003,253.89	13.65	29,509.05	16.05
17,463.95	166,367.06	0.24	156.98	132,674,937.21	13.71	29,659.20	16.13
17,463.95	166,367.06	0.29	156.98	133,346,620.53	13.78	29,809.35	16.22
17,463.95	166,367.06	0.33	156.98	134,018,303.86	13.85	29,959.51	16.30
Utilization standard is 80% of that of current level							
17,463.95	166,367.06	0.20	147.74	176,004,338.52	18.19	41,804.48	22.74
17,463.95	166,367.06	0.24	147.74	176,899,916.28	18.29	42,017.20	22.86
17,463.95	166,367.06	0.29	147.74	177,795,494.04	18.38	42,229.92	22.97
17,463.95	166,367.06	0.33	147.74	178,691,071.81	18.47	42,442.63	23.09
Utilization standard is 75% of that of current level							
17,463.95	166,367.06	0.20	138.51	220,005,423.14	22.74	55,739.31	30.32
17,463.95	166,367.06	0.24	138.51	221,124,895.35	22.86	56,022.93	30.48
17,463.95	166,367.06	0.29	138.51	222,244,367.56	22.97	56,306.55	30.63
17,463.95	166,367.06	0.33	138.51	223,363,839.76	23.09	56,590.18	30.78
Utilization standard is 70% of that of current level							
17,463.95	166,367.06	0.20	129.28	264,006,507.77	27.29	71,664.82	38.98
17,463.95	166,367.06	0.24	129.28	265,349,874.42	27.43	72,029.48	39.18
17,463.95	166,367.06	0.29	129.28	266,693,241.07	27.57	72,394.14	39.38
17,463.95	166,367.06	0.33	129.28	268,036,607.71	27.71	72,758.80	39.58

〈Table IV-11〉 **(Bell-shaped Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 41.50%, k_g = 58.50%) Score 65-74: unhealthy; 53-64: healthy**

(Unit: persons, %, thousand won)

K_b	K_a	a'	q'	S(2)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
Utilization standard is 90% of that of current level							
76,290.87	107,541.14	0.20	166.21	58,552,081.46	6.05	12,362.02	6.72
76,290.87	107,541.14	0.24	166.21	60,508,237.48	6.25	12,775.02	6.95
76,290.87	107,541.14	0.29	166.21	62,464,393.50	6.46	13,188.02	7.17
76,290.87	107,541.14	0.33	166.21	64,420,549.52	6.66	13,601.02	7.40
Utilization standard is 85% of that of current level							
76,290.87	107,541.14	0.20	156.98	87,828,122.19	9.08	19,633.79	10.68
76,290.87	107,541.14	0.24	156.98	90,762,356.22	9.38	20,289.73	11.04
76,290.87	107,541.14	0.29	156.98	93,696,590.25	9.69	20,945.67	11.39
76,290.87	107,541.14	0.33	156.98	96,630,824.28	9.99	21,601.61	11.75
Utilization standard is 80% of that of current level							
76,290.87	107,541.14	0.20	147.74	117,104,162.92	12.11	27,814.53	15.13
76,290.87	107,541.14	0.24	147.74	121,016,474.96	12.51	28,743.79	15.64
76,290.87	107,541.14	0.29	147.74	124,928,787.00	12.91	29,673.04	16.14
76,290.87	107,541.14	0.33	147.74	128,841,099.05	13.32	30,602.29	16.65
Utilization standard is 75% of that of current level							
76,290.87	107,541.14	0.20	138.51	146,380,203.64	15.13	37,086.05	20.17
76,290.87	107,541.14	0.24	138.51	151,270,593.70	15.64	38,325.05	20.85
76,290.87	107,541.14	0.29	138.51	156,160,983.75	16.14	39,564.05	21.52
76,290.87	107,541.14	0.33	138.51	161,051,373.81	16.65	40,803.05	22.20
Utilization standard is 70% of that of current level							
76,290.87	107,541.14	0.20	129.28	175,656,244.37	18.16	47,682.06	25.94
76,290.87	107,541.14	0.24	129.28	181,524,712.44	18.76	49,275.06	26.80
76,290.87	107,541.14	0.29	129.28	187,393,180.50	19.37	50,868.06	27.67
76,290.87	107,541.14	0.33	129.28	193,261,648.57	19.98	52,461.06	28.54

〈Table IV-12〉 **(Bell-shaped Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 75.50%, k_g = 24.50%) Score 61-74: unhealthy; 53-60: healthy**

(Unit: persons, %, thousand won)

K_b	K_a	a'	q'	S(2)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
Utilization standard is 90% of that of current level							
138,792.41	45,038.60	0.20	166.21	28,121,536.30	2.91	5,937.26	3.23
138,792.41	45,038.60	0.24	166.21	30,820,053.51	3.19	6,506.99	3.54
138,792.41	45,038.60	0.29	166.21	34,378,796.73	3.55	7,258.35	3.95
138,792.41	45,038.60	0.33	166.21	37,937,539.96	3.92	8,009.70	4.36
Utilization standard is 85% of that of current level							
138,792.41	45,038.60	0.20	156.98	40,891,965.43	4.23	9,141.31	4.97
138,792.41	45,038.60	0.24	156.98	46,230,080.26	4.78	10,334.64	5.62
138,792.41	45,038.60	0.29	156.98	51,568,195.10	5.33	11,527.96	6.27
138,792.41	45,038.60	0.33	156.98	56,906,309.93	5.88	12,721.28	6.92
Utilization standard is 80% of that of current level							
138,792.41	45,038.60	0.20	147.74	54,522,620.57	5.64	12,950.19	7.04
138,792.41	45,038.60	0.24	147.74	61,640,107.02	6.37	14,640.73	7.96
138,792.41	45,038.60	0.29	147.74	68,757,593.46	7.11	16,331.28	8.88
138,792.41	45,038.60	0.33	147.74	75,875,079.91	7.84	18,021.82	9.80
Utilization standard is 75% of that of current level							
138,792.41	45,038.60	0.20	138.51	68,153,275.72	7.05	17,266.92	9.39
138,792.41	45,038.60	0.24	138.51	77,050,133.77	7.96	19,520.98	10.62
138,792.41	45,038.60	0.29	138.51	85,946,991.83	8.88	21,775.04	11.85
138,792.41	45,038.60	0.33	138.51	94,843,849.89	9.80	24,029.09	13.07
Utilization standard is 70% of that of current level							
138,792.41	45,038.60	0.20	129.28	81,783,930.86	8.45	22,200.33	12.08
138,792.41	45,038.60	0.24	129.28	92,460,160.53	9.56	25,098.40	13.65
138,792.41	45,038.60	0.29	129.28	103,136,390.20	10.66	27,996.47	15.23
138,792.41	45,038.60	0.33	129.28	113,812,619.87	11.77	30,894.55	16.81

〈Table IV-13〉 **(Bell-shaped Distribution) Simulation Results for Two-tier Differentiation Plan (k_b = 93.75%, k_g = 6.25%) Score 57-74: unhealthy; 53-56: healthy**

(Unit: persons, %, thousand won)

K_b	K_a	a'	q'	S(2)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
Utilization standard is 90% of that of current level							
172,341.56	11,489.44	0.20	166.21	10,465,542.46	1.08	2,209.57	1.20
172,341.56	11,489.44	0.24	166.21	14,884,511.70	1.54	3,142.55	1.71
172,341.56	11,489.44	0.29	166.21	19,303,480.93	2.00	4,075.52	2.22
172,341.56	11,489.44	0.33	166.21	23,722,450.17	2.45	5,008.49	2.72
Utilization standard is 85% of that of current level							
172,341.56	11,489.44	0.20	156.98	15,698,313.70	1.62	3,509.32	1.91
172,341.56	11,489.44	0.24	156.98	22,326,767.55	2.31	4,991.10	2.72
172,341.56	11,489.44	0.29	156.98	28,955,221.40	2.99	6,472.88	3.52
172,341.56	11,489.44	0.33	156.98	35,583,675.25	3.68	7,954.65	4.33
Utilization standard is 80% of that of current level							
172,341.56	11,489.44	0.20	147.74	20,931,084.93	2.16	4,971.54	2.70
172,341.56	11,489.44	0.24	147.74	29,769,023.40	3.08	7,070.73	3.85
172,341.56	11,489.44	0.29	147.74	38,606,961.87	3.99	9,169.91	4.99
172,341.56	11,489.44	0.33	147.74	47,444,900.33	4.90	11,269.09	6.13
Utilization standard is 75% of that of current level							
172,341.56	11,489.44	0.20	138.51	26,163,856.16	2.70	6,628.72	3.61
172,341.56	11,489.44	0.24	138.51	37,211,279.25	3.85	9,427.64	5.13
172,341.56	11,489.44	0.29	138.51	48,258,702.33	4.99	12,226.55	6.65
172,341.56	11,489.44	0.33	138.51	59,306,125.42	6.13	15,025.46	8.17
Utilization standard is 70% of that of current level							
172,341.56	11,489.44	0.20	129.28	31,396,627.39	3.25	8,522.65	4.64
172,341.56	11,489.44	0.24	129.28	44,653,535.10	4.62	12,121.25	6.59
172,341.56	11,489.44	0.29	129.28	57,910,442.80	5.99	15,719.85	8.55
172,341.56	11,489.44	0.33	129.28	71,167,350.50	7.36	19,318.45	10.51

Three-tier Patients' Co-payment Differentiation Plan: In order to establish the three-tier differentiated payment plan, policy variables such as a', a'', q', q'' must be determined: a' for 0.49, which is triple the current patients' co-payment ratio; a'' for 0.05, which is relatively low; q' for 166.21 patient days, which is 90 percent of the current utilization volume; and the major variables q'' for 147.74, 138.51, 129.28, 120.04 patient days, which are respectively 0.80, 0.75, 0.70, 0.65 times the current utilization volume. Based on these variables, reductions in NHIS benefits spending will be reviewed.

〈Table IV-14〉 **(Uniform Distribution) Simulation Results for Three-tier Differentiation Plan**

(Unit: person, %, thousand won)

K_b	K_a	a'	a''	q'	q''	S(3)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
$k_b = 36.360\%,\ k_b = 63.64\%$									
66,847.64	116,983.36	0.49	0.05	147.74	166.21	132,264,116.50	13.67	31,417.70	17.09
66,847.64	116,983.36	0.49	0.05	138.51	166.21	169,901,750.84	17.56	43,048.59	23.42
66,847.64	116,983.36	0.49	0.05	129.28	166.21	207,539,385.19	21.45	56,341.03	30.65
66,847.64	116,983.36	0.49	0.05	120.04	166.21	245,177,019.54	25.34	71,678.47	38.99
$k_b = 50.00\%,\ k_b = 50.00\%$									
91,915.50	91,915.50	0.49	0.05	147.74	166.21	109,309,769.12	11.30	25,965.18	14.12
91,915.50	91,915.50	0.49	0.05	138.51	166.21	142,923,168.58	14.77	36,212.93	19.70
91,915.50	91,915.50	0.49	0.05	129.28	166.21	176,536,568.04	18.25	47,924.65	26.07
91,915.50	91,915.50	0.49	0.05	120.04	166.21	210,149,967.50	21.72	61,438.17	33.42
$k_b = 68.18\%,\ k_b = 31.82\%$									
125,339.32	58,491.68	0.49	0.05	147.74	166.21	78,703,972.61	8.14	18,695.15	10.17
125,339.32	58,491.68	0.49	0.05	138.51	166.21	106,951,725.56	11.06	27,098.72	14.74
125,339.32	58,491.68	0.49	0.05	129.28	166.21	135,199,478.50	13.98	36,702.81	19.97
125,339.32	58,491.68	0.49	0.05	120.04	166.21	163,447,231.45	16.90	47,784.44	25.99

〈Table IV-15〉 **(Bell-shaped Distribution) Simulation Results for Three-tier Differentiation Plan**

(Unit: person, %, thousand won)

K_b	K_a	a'	a''	q'	q''	S(3)	Decline rate of NHIS co-payment	Potential increase in service users K_g	Additional access rate
$k_b = 9.50\%,\ k_b = 90.50\%$									
17,463.95	166,367.06	0.49	0.05	147.74	166.21	177,484,180.84	18.35	42,159.16	22.93
17,463.95	166,367.06	0.49	0.05	138.51	166.21	223,049,557.91	23.06	56,514.83	30.74
17,463.95	166,367.06	0.49	0.05	129.28	166.21	268,614,934.98	27.77	72,921.30	39.67
17,463.95	166,367.06	0.49	0.05	120.04	166.21	314,180,312.06	32.48	91,851.85	49.97
$k_b = 41.50\%,\ k_b = 58.50\%$									
76,289.87	107,541.14	0.49	0.05	147.74	166.21	123,617,978.98	12.78	29,363.91	15.97
76,289.87	107,541.14	0.49	0.05	138.51	166.21	159,739,818.19	16.51	40,473.82	22.02
76,289.87	107,541.14	0.49	0.05	129.28	166.21	195,861,657.40	20.25	53,170.86	28.92
76,289.87	107,541.14	0.49	0.05	120.04	166.21	231,983,496.60	23.98	67,821.29	36.89
$k_b = 75.50\%,\ k_b = 24.50\%$									
138,792.41	45,038.60	0.49	0.05	147.74	166.21	66,385,139.52	6.86	15,768.96	8.58
138,792.41	45,038.60	0.49	0.05	138.51	166.21	92,473,219.74	9.56	23,430.25	12.75
138,792.41	45,038.60	0.49	0.05	129.28	166.21	118,561,299.96	12.26	32,186.02	17.51
138,792.41	45,038.60	0.49	0.05	120.04	166.21	144,649,380.19	14.95	42,288.82	23.00
$k_b = 93.75\%,\ k_b = 6.25\%$									
172,341.56	11,489.44	0.49	0.05	147.74	166.21	35,664,571.27	3.69	8,471.68	4.61
172,341.56	11,489.44	0.49	0.05	138.51	166.21	56,366,883.81	5.83	14,281.87	7.77
172,341.56	11,489.44	0.49	0.05	129.28	166.21	77,069,196.34	7.97	20,922.09	11.38
172,341.56	11,489.44	0.49	0.05	120.04	166.21	97,771,508.88	10.11	28,583.89	15.55

According to <Table IV-14>, when the ratio between healthy and unhealthy recipients is 63.64 percent to 36.36 percent, the policy variable q' decreases from 147.74 to 120.04 patient days and therefore increases the coverage gap, which results in the calculation that the decline in NHIS benefits spending will increase from 132.3 billion won to 245.2 billion won. This is an amount capable of providing benefits to between 31,417 to 71,678 new beneficiaries who have been excluded from entitlement. In contrast, in the case that the share of healthy recipients decreased to 31.82 percent and that of unhealthy recipients increased to 68.18 percent, the decline of NHIS benefits spending is from 78.6 billion to 163.4 billion won. This implies that a greater proportion of healthy elderly patients and a wider coverage gap results in a greater rate of decline. This phenomenon also stands true in <Table IV-15>.

D. Considerations for Introduction of the System

Current system of paying a fixed amount of benefits within each grade may already have been established in consideration of the minimum utilization rate. However, various data shows that the amount of use differs according to the extent of patients' co-payment. This suggests that the plan for the differentiation of patients' co-payment by the amount of service usage could relieve the NHIS's benefit spending burden by changing the behavior of economic agents.

These institutional changes, however, must not exert a negative influence on the economic conditions and health status of the policy subjects.[14] For this reason, the simulations of this study were conducted only on grade three general recipients. Measures for patients' co-payment differentiation by the amount of service usage must be reviewed within the boundary of having no negative influence on the recipients' health conditions, as well as by using various distributions to represent the specific behavioral aspects of the recipients.

14) There is an ongoing debate on the differentiation method, especially on the coverage gap in Medicare Part D. In other words, while differentiated payment may benefit national finance, it has the potential negative influence on the health status of recipients. Therefore, policy design is required to achieve positive fiscal effect and minimize negative influences on health status at the same time.

Summary & Conclusion

Many countries face concerns over expanding government expenditures on long-term care resulting from population aging and the subsequent rise in the number of long-term care recipients, and are considering various measures including an increase in insurance premiums, transition from facility care to home care, provision of community-based services, etc. Also, some European countries are working on introducing cash and voucher payment systems and strengthening support for private insurance. Other countries have endeavored to reduce government spending through the integration of long-term care and healthcare services, but noteworthy accomplishments have yet to be reported. Many nations including South Korea are now spending more and more money on preventive services, and therefore the rate of increase in the number of recipients of the long-term care insurance is expected to decelerate.

Although many countries are presenting macroscopic policy measures in consideration of the sustainability of the long-term care system, practical and substantial measures from a microscopic perspective have remained elusive.

Before conducting the simulation to identify ways to enhance efficiency in government expenditures, this study examined the characteristics of recipient households of the elderly long-term care insurance by applying methodologies such as propensity score matching. Dividing and comparing sample households into four categories—recipients of the long-term care insurance, recipients of the elderly care service, non-recipients with an ailing family member aged over 65, and non-recipients without an ailing family member aged over 65, the first group showed the highest level in ordinary income and the lowest level in the

proportion of the low-income class among the four groups. Statistical significance was confirmed for such differences, while the same group also scored the lowest in the average age of household heads and the proportion of female household heads, and the highest in the educational level of household heads, subscription to health insurance, and healthcare expenditure, which demonstrates better social and economic conditions than the other three groups. These results also stand true even when many variables are controlled, and it proves that there is ample room for introducing the plan of patients' co-payment differentiation, the key proposal of this study.

In order to identify measures to enhance efficiency in government expenditures on the elderly long-term care insurance, this study assessed the plan of differentiating grants from the National Health Insurance Service (NHIS) to long-term care institutions according to their service quality, and the plan of differentiating patients' co-payment according to the patients' level of usage, which is currently charged at a flat rate per each unit service. Then, a simulation was conducted by assuming many policy variables and distributions of recipients. The idea of differentiated grants provided by the NHIS to long-term care institutions originates from the recognition that a surge in the number of long-term care institutions in a short period of time may compromise the quality of services they provide. Indeed, according to a survey conducted by the NHIS, a number of institutions are being operated with sizes and manpower that fall short of satisfying legal standards, and the gap between superior and inferior institutions will remain the same or widen as time progresses. In particular, small institutions that have recently been built in large numbers generally scored poorly in the survey. Therefore, this study utilized the five grades (A to E) used in the NHIS survey, and established two-tier, three-tier, and five-tier models according to the level of grants provided to institutions. The results of simulations differed according to the proportion of each group and the benefit gap between groups. When long-care care institutions were divided into the five grades of A to E, the estimated amount of reduction in expenditure compared to the current level varied from 135,885,000,000 won to 1,304,496,000,000 won according to policy variables. Such amounts of money equates to coverage for 13,747 to 131,971 people currently excluded from the insurance system.

The idea of patients' co-payment differentiation was initiated from the

trend of increase in not only the number of recipients but also the utilization rate and care expenses since the introduction of the elderly long-term care insurance. According to the Statistical Yearbook of Long-term Care Insurance for the Elderly, the number of patient days per person increased from 176 days in 2009 to 217 days in 2012. Even in the case when the health conditions of recipients are the same, beneficiaries of national basic livelihood who are exempt from co-payment and those who are subject to the reduced rate of co-payment showed higher usage than general insurance holders. In this study, the model for the co-payment rate was set in two formats; the stair-shaped two-step model and the three-step model which includes a coverage gap. Subsequently, many simulations were conducted according to chosen policy variables. The results of the simulations widely differed according to policy variables including the ratio of recipients with good health to those with bad health, the degree of co-payment differentiation, the utilization rates applied to differentiation, etc. When recipients with relatively good health were large in numbers, and a policy variable related to utilization acted to widen a coverage gap, the estimated amount of the NHIS's expenditures dropped compared to the current level of spending.

It is true that the measures for greater spending efficiency introduced in this study cannot be reflected in a policy immediately. Grant differentiation according to the service quality of each institution absolutely requires an evaluation system that could be trusted and accepted by institutions, and therefore it must be preceded by a review of whether the current evaluation system is adequate. Also, if the current level of insurance fees is unfeasible, evaluation results should be applied with a measure of flexibility. As for the differentiation of patients' co-payment, an institutional design must be in place to prevent the situation in which an institutional change leads to the deteriorating health of recipients.

Critics of this study may point out that the two measures suggested in this study are unacceptable. In the current aging society, issues related to old-age income have begun to emerge as an important topic, but upon entering into an aged or super-aged society, the prevailing topic in society is highly likely to be that of elderly long-term health insurance. Preparations must be made at the soonest possible opportunity to respond to this dilemma, and the two suggestions presented by this paper must be considered as a priority at this juncture, and holds significance as basic research for future policy directions.

Lastly, it is the author's hope that research will continue with regards to the perspective of enhancing fiscal efficiency, on topics such as the region-specific benefit (prevention) service that is currently being implemented in major countries, and the establishment of a preventive system towards fraudulent exploitation of the elderly long-term insurance, despite their omission from being directly discussed in this study.

References

Centers for Medicare & Medicaid Services (CMS), *Medicare & You,* 2013

Jang, Bong-seok, "Measures for Improving the Publicness of Elderly Long-term Care Insurance System – From the Legal and Institutional Perspective, Focusing on the Service Field," *Measures for Improving the Publicness of Elderly Long-term Care Insurance* Seminar data, 2012. 11. 12.

Jang, Ho-yeon, "Proposal on Improving Publicness of the Elderly Long-term Care Insurance," *Measures for Improving the Publicness of Elderly Long-term Care Insurance* Seminar data, 2012. 11. 12.

Kim, Chan-u, "A Study on a Model of Prospective Care Management System Aligning with Current National Long-term Care Insurance (NLTCI) Policy for Elders," *Health and Social Welfare Review*, Vol. 33, Issue 2, 2013.

______, "Measures for Strengthening Coverage of Elderly Long-term Care Insurance System," *Policy Debate on Measures for Strengthening Coverage of Elderly Long-term Care Insurance* Sourcebook, 2013. 3. 5.

Kwon, Sun-man, "German Long-term Care Insurance," FES-Information-Series, Friedrich-Ebert-Stiftung, Korea Office, 2004. 4.

Lee, Eunkyeong, "Long-term Public Finance Forecasting for Elderly Long-term Care Insurance," *Monthly Public Finance Forum*, 2010. 12.

NHIS, "First Assessment Results of Evaluation Committee for Long-term Care institutions in 2013," 2013.

NHIS, *2011 Evaluation on Long-term Care institutions*, 2012. 5.

NHIS, *2012 Evaluation on Long-term Care institutions*, 2013. 4.

NHIS, *Practical Health Welfare Plan*, 2012. 07.

NHIS, "Satisfaction for Elderly Long-term Care Insurance Increases by 1.6%p to 88.5%," Press release, 2013. 7. 4.

NHIS, *Statistical Yearbook of Long-term Care Insurance for the Elderly*, annual.

OECD, *Help Wanted? Providing and Paying for Long-Term Care*, 2011

Park, Hyeong-su, and Byung Mok Jeon, *Study on Budgetary Projection Model for Analyzing Finance of Social Welfare*, Korea Institute of Public Finance, 2009.10.

Park, No-Wook and Byeong-hil Jeon, "Economic and Financial Effect of Long-term Care Insurance, 2nd version," *Performance Analysis on Operation of Elderly Long-term Care Insurance*, Korea Institute of Public Finance, 2011. 2.

Seonu, Deok, "Improvement Direction for Elderly Long-term Care Insurance From Analysis of Changes in Fiscal Expenditure," *Health and Welfare Issue & Focus*, Korea Institute for Health and Social Affairs, Vol. 153 (2012-34), 2012. 8. 24.

Statistics Korea, "Statistics on the Elderly," annual.

Yun, Hee-suk and Hyung-joon Kwon, "Projecting Public Expenditures for Long-Term

Care in Korea," *Korean journal of health policy and administration*, Vol. 20-1, 2010.

Yoon, Sung-Joo, "Reflections on Improvement Direction for Basic Old Age Pension System," *Monthly Public Finance Forum*, Korea Institute of Public Finance, 2012.7.

National Health Insurance Service NHIS, http://www.nhis.or.kr