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Medicaid Spending Forecasts and Fiscal Efficiency

December 2014 | Seng Eun Choi

KIPF KOREA INSTITUTE OF PUBLIC FINANCE

Korea Institute of Public Finance
1924, Hannuri-daero, Sejong, 339-007, Korea
Tel: 82-44-414-2114 Fax: 82-44-414-2179
URL: www.kipf.re.kr

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Introduction

The amount of public spending on Medicaid, a public program under which healthcare services are provided for low-income households, has been increasing rapidly over the last decade or so. Medicaid provides a comprehensive range of medical services for individuals and families who are beneficiaries of the National Basic Livelihood Security Program (NBLSP). Along with the sudden growth of the amount of medical expenses for low-income households, the amount of public spending on medical benefits and services is growing at a pace that far outweighs those of other public spending programs, including education and housing. The rise of public spending on Medicaid seems unstoppable, despite the fact that the number of NBLSP beneficiary households and the program's benefits have been cut by more than half. This situation has led to skepticism and criticism over the fiscal efficiency of the Medicaid program. The amount of medical spending per NBLSP beneficiary is growing much more quickly than the amount of medical spending per non-NBLSP beneficiary. This is not only because there are more elderly and ill people in the former group, but also because NBLSP beneficiaries tend to use medical services and benefits excessively. Evidence of this is in the growth of hospitalization expenses for NBLSP beneficiaries—for which they are required to pay no out-of-pocket expenses—which is leading the rise in the total amount of public healthcare spending.

Of course, we cannot blame the low-income sector only for the multiplying amounts of public spending on medical services and benefits in Korea. The rapidly aging population is another main cause of the problem, and

presents the most significant threat to fiscal stability in Korea in the future. One of the reasons we ought to worry about the rapid increase in the amount of public spending on medical benefits for the low-income sector is because at least 30 percent of these beneficiaries are seniors aged 65 or older, a proportion that will grow only larger in the future. Moreover, Medicaid benefits, which have so far been provided in tandem with NBLSP benefits, will begin to be provided separately in 2015. This change may not only increase the amount of public spending per beneficiary, but also the entire pool of beneficiaries itself.

This study attempts to forecast mid- to long-term trends in public spending on Medicaid benefits, with the goal of identifying the risks that increases in such spending may present to Korea's fiscal stability. The main causes of the increase in Medicaid spending are the conversion of the payment structure toward individual Medicaid benefits, and the aging of the population at large. This study therefore provides two different forecasts, assuming two different future situations: (a) a forecast on future spending assuming that the current NBLSP-with-Medicaid structure is maintained and Medicaid benefits are provided on the basis of the current definition of the minimum cost of living; and (b) a forecast on future spending assuming that Medicaid benefits are provided separately of NBLSP benefits and on the basis of median income. This study also makes forecasts on future trends in Medicaid spending for each age group, with a view to identifying and analyzing the future implications of the aging population.

1 Medicaid: Overview

Medicaid, which supports healthcare services for the low-income sector, provides benefits in tandem with those of the National Basic Livelihood Security Program (NBLSP). The original legal grounds for Medicaid are found in the provisions on medical protection in the National Basic Livelihood Security Act (NBLSA) that was originally put into force in 1961. However, the actual structure for the implementation of Medicaid benefits did not come into being until the enactment of the Enforcement Ordinance for the NBLSA in 1969. In the early days of the legislation, only persons who were unable to maintain their own

living were eligible to seek out and receive medical care at public or designated private-sector medical institutions. When the Korean government decided, in the 1970s, to set aside a portion of the medical aid donated by foreign assistance organizations for the treatment of low-income households, the number of institutions and practitioners serving the low-income sector began to increase. In 1977, the Korean government fortified medical protection by enacting the Medical Protection Act (MPA), treating it as a subject matter separate from livelihood security. The eligibility criteria, the types and scopes of benefits, and the out-of-pocket-expense ratio under the MPA kept changing until 2001, when the MPA was amended and renamed as the current Medical Aid and Assistance Act (MAAA). The new legislation led to the current Medicaid administration structure, under which the Central Medicaid Review Committee was created and the National Health Insurance Service (NHIS) was designated as the main payer of Medicaid benefits.

Although the MAAA principally seeks to benefit beneficiaries of the NBLSP, it also contains provisions for the homeless and for certain beneficiaries of other public social welfare programs.[1] Medicaid benefits are divided into two classes, depending on their types and scopes of coverage. The MAAA divides medical institutions in Korea into three tiers. The primary institutions include clinics, community health centers, and county hospitals; the secondary ones, hospitals and general hospitals; and the tertiary ones, secondary medical institutions designated by the government to provide Medicaid services. Medicaid beneficiaries must start with the primary institutions, and may proceed all the way to the tertiary tier if required. In other words, they must first see medical practitioners at either community health centers or county hospitals, after which they can proceed to a higher-tier institution only upon referral. Medicaid benefits are now a main source of moral hazard in Korea, with over 22.9 percent of Medicaid beneficiaries receiving benefits and services year round as of 2005

1) In order for homeless persons to be eligible for benefits under the MAAA, he or she must: (1) have no permanent domicile; (2) have been hospitalized at the current institution by an administrative authority; (3) have received confirmation by a doctor as a patient in need of emergency care; and (4) have no one who is bound by duty to support him or her, or have someone bound by duty but unable to assist due to financial constraints

(Yu, 2005). The government therefore requires Medicaid beneficiaries who have received more care and services than their due or who require repeated care to seek the services they need from selected medical institutions.

Class-1 beneficiaries of Medicaid pay no out-of-pocket expenses upon being hospitalized. The amount of out-of-pocket expenses these beneficiaries are required to pay on an outpatient basis ranges from KRW 1,000 to KRW 2,500 only. Class-1 Medicaid beneficiaries are also required to pay only 5 percent of the total cost of medical imaging treatments such as magnetic resonance imaging (MRI) and computerized tomography (CT). Elderly beneficiaries aged 75 or older need only pay 20 percent of the cost of dentures. Of the Class-1 beneficiaries, those who are under the age of 18, pregnant, enrolled at secondary schools, homeless, or carrying a severe or rare disease pay no out-of-pocket expenses, even as outpatients. Class-2 Medicaid beneficiaries are required to pay 10 percent of the total cost of their hospitalization, and pay more than their Class-1 counterparts as they move up the tiers of medical institutions. Nevertheless, there is a ceiling to the amounts of out-of-pocket expenses paid by Class-2 beneficiaries, who are entitled to receive part or the entirety of the expenses they have paid in reimbursements. Should a Class-1 beneficiary spend more than KRW 20,000 a month on medical benefits, the deductible compensation system requires that he or she be reimbursed 50 percent of the excess expenses he or she has paid. Should he or she spend more than KRW 50,000 a month, which is the deductible ceiling, he or she will be reimbursed the entire amount of the excess expenses. The 50-percent reimbursement applies to a Class-2 beneficiary who has paid more than KRW 200,000 a month, and the 100-percent reimbursement applies when he or she has spent more than KRW 600,000 a month.

Class-1 beneficiaries of Medicaid are NBLSP beneficiaries who meet certain requirements or qualifications, including those who have been injured for worthy/public causes; victims of natural or major disasters; national patriots and heroes; adopted children; persons officially recognized as Important Intangible Cultural Properties; North Korean settlers; persons who participated in the Gwangju Democratization Movement; and the homeless and those without families. It was only in 2012 that homeless people were included in the range of Class-1 beneficiaries. Class-1 NBLSP beneficiaries include: members of

households lacking a single breadwinner; residents at social welfare facilities; and patients with severe or rare diseases. Of the NBLSP beneficiaries, those who are under the age of 18 or over the age of 65 who have severe disabilities, are pregnant, have completed military service duties, and/or require medical care for three months or longer are recognized as Class-1 NBLSP beneficiaries. NBLSP beneficiaries in households with breadwinners, and who do not meet the qualifications for Class-1 NBLSP beneficiaries, are categorized as Class-2 Medicaid beneficiaries. The near-poverty group was included in the range of Medicaid beneficiaries in 2004, before being converted back into National Health Insurance (NHI) beneficiaries in 2008.

As the Medicaid program in Korea has evolved alongside programs for protecting livelihood security, Medicaid has traditionally benefitted NBLSP beneficiaries almost exclusively until now. However, faced with the growing need to provide affordable medical care for the near-poverty group, the Korean government extended Medicaid benefits to those in the near-poverty group suffering from rare or chronic diseases in 2004, and further to the children (aged 12 and under) of near-poverty households in 2005. When Medicaid benefits were expanded for the near-poverty group to include children under the age of 18 in 2006, spending for the program began to multiply rapidly. The Korean government therefore began to roll back Medicaid benefits in 2008, first by converting the status of near-poverty patients with Class-1 rare or chronic diseases into NHI beneficiaries, and further by converting the status of patients with Class-2 rare or chronic diseases and children under the age of 18 into NHI beneficiaries in 2009. Since 2009, only NBLSP beneficiaries and select beneficiaries of a handful of other social welfare programs have been eligible to receive Medicaid in Korea.

The rise of moral hazards among Medicaid beneficiaries eventually led the Korean government to require even Class-1 beneficiaries to pay small amounts of the expenses incurred for medical care and services beginning in 2007. At the same time, however, the government also began to provide up to KRW 6,000 per month for each Class-1 Medicaid beneficiary. The current Medicaid benefit structure still invites moral hazards, as it reimburses significant amounts of money that Class-1 beneficiaries pay as outpatients (i.e., 50 percent of all expenses in excess of KRW 20,000 a month, and 100 percent of all

expenses in excess of KRW 50,000 a month, per beneficiary), and does not require that these beneficiaries pay any expenses associated with hospitalization.

Starting in the latter half of 2014, the Korean government will provide Medicaid benefits individually and separately of NBLSP benefits. Should the government begin to provide Medicaid benefits for all individuals or households making 40 percent or less of the current median income, the amount of spending for Medicaid will begin to multiply exponentially as will the pool of beneficiaries. The most significant change with the current reform is that the definition of "poverty" it adopts is no longer based on the minimum cost of living, but rather on the median income. This switch from an absolute definition of poverty to a relative one represents a watershed moment in the evolution of social assistance programs in Korea. Although many have argued the need to adopt this relative paradigm on poverty in Korea's social assistance policy, the switch comes with a new set of downsides and shortcomings heretofore not experienced under the absolute concept. Moreover, such Medicaid reform is being undertaken without the benefit of a more extensive and in-depth public debate.

〈Table I-1〉 **Medicaid Reform: Overview**

Current			After reform	
Eligibility	Benefits		Eligibility	Benefits
Persons making minimum cost of living (MCL) or less	Cash benefits amounting to 80% of MCL (not including costs of in–kind benefits, etc.)	Living	Persons earning 30% of median income or less	Benefits amounting to 30% of median income
		Housing	Persons earning 43% of median income or less	Local standard rent amount
	Little to no out–of–pocket expenses for necessary medical services (in– kind benefits)	Medical	Persons earning 40% of median income or less	Same as present
	Educational tuition fees, textbooks, etc. (in–kind benefits)	Education	Persons earning 50% of median income or less	Same as present

Source: Ministry of Health and Welfare (internally circulated information)

Ⅱ

Medicaid Benefit Structure: Present Problems

1 Medicaid spending and benefit structure today

Medicaid spending accounts for almost 50 percent of the total expenditure of the NBLSP in Korea today. The amount of Medicaid spending multiplied rapidly from KRW 1.6 trillion in 2001 to KRW 4.4 trillion in 2014, at a rate of 8.2 percent each year on average. Compare this to the pace of increase in the amount of NBLSP spending, which was 7.7 percent a year over the same period. In particular, the expansion of Medicaid to members of near-poverty households from 2004 to 2006 fuelled a rapid increase in the amount of Medicaid spending, from KRW 1.8 trillion in 2003 to KRW 3.6 trillion in 2007. Accordingly, the Korean government brought near-poverty Medicaid beneficiaries back into the scope of NHI in 2008, beginning with near-poverty patients with Class-1 rare or chronic diseases in April that year, and following with near-poverty patients with Class-2 rare or chronic diseases as well as children (under age 18) in near-poverty households in April the following year. While this helped somewhat to stem the increase in Medicaid spending from 2008 to 2010, the total amount of public spending on medical benefits and services has continued to grow nonetheless, including expenditure from the NHI account for near-poverty households. The City of Seoul, provinces, and metropolitan cities match local medical spending by 50 percent, 80 percent, and 20 percent, respectively. In the case of provinces in particular, the cities and

counties in each given province also share the medical spending cost by 6 percent and 4 percent each, respectively. Increases in medical spending, therefore, can have a significant impact on local budgets and spending structures. As of 2010, of the total public medical spending, 24 percent came from local sources, with the National Treasury funding 77 percent of Medicaid spending on average

〈Table II-1〉 **Trends in the NBLSP and Medicaid Budgets**

(Unit: KRW 100 million)

Year	NBLSP[1]					NHI budget for near-poverty households[4]
		Livelihood security[2]				
			Livelihood benefits	Medicaid benefits[3]	Other	
2001	32,419	31,495	12,835	15,893	2,767	–
2002	33,819	32,340	12,641	16,901	2,798	–
2003	35,045	33,549	13,130	17,612	2,807	–
2004	38,275	36,192	14,449	18,810	2,933	–
2005	45,304	42,970	18,404	21,325	3,241	–
2006	52,691	50,035	20,293	26,623	3,119	–
2007	65,389	62,468	23,086	35,771	3,611	–
2008	67,484	64,551	22,564	35,161	6,826	688
2009	73,323	69,397	25,193	37,908	6,296	1,478
2010	71,119	67,587	24,492	35,002	8,093	1,139
2011	74,519	69,613	21,335	36,718	11,560	1,335
2012	76,533	71,057	23,618	39,812	7,627	1,546
2013	82,472	76,601	25,902	42,478	8,221	2,107
2014 budget	84,709	79,215	25,240	44,366	9,609	2,735
Annual growth rate	7.67%	7.35%	5.34%	8.22%	10.05%	25.9%

Notes: 1) The NBLSP budget consists of budgets supporting both living security and other self-sufficiency benefits/services
2) The living security budget consists of benefits for living, medical expenses, and others (e.g., housing, education, childbirth and funeral, and grain price discount benefits, etc.)
3) Medical benefits required additional budgets of KRW 450 billion in 2001, KRW 82.3 billion in 2005, KRW 274.7 billion in 2008, KRW 92 billion in 2009, and KRW 145.6 billion in 2013
4) The NHI budget for near-poverty households supports part of the medical expenses of these households as well as the medical expenses of locally-based NHI subscribers

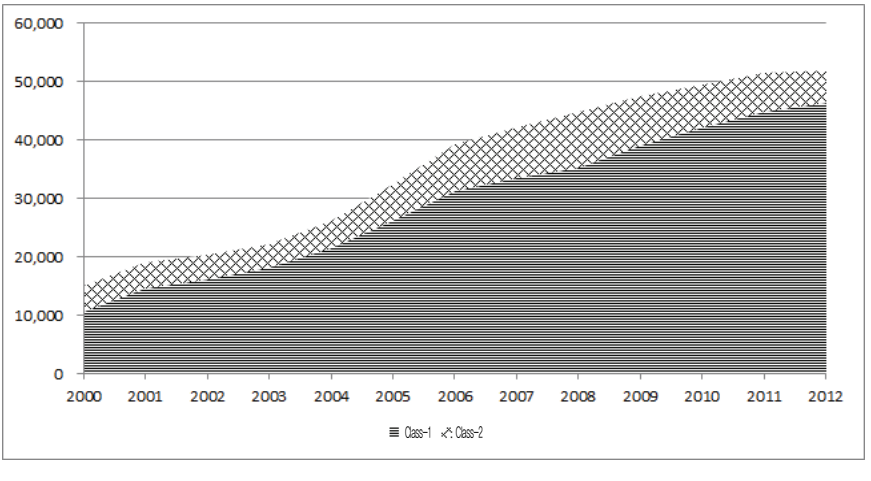
Sources: Ministry of Health and Welfare, *Overview of Budget 2014 and Fund Administration Plans; Guidelines on Major Tasks*, each year

(National Assembly Budget Office, 2013). Municipal and provincial governments have raised their own medical benefit funds and deposited them with the NHIS for efficient administration and management thereof.

The total amount of medical benefits spending, as <Table II-1> shows, grew at a rate of 9.62 percent a year, from KRW 1.9 trillion in 2001 to KRW 5.2 trillion in 2012. Class-1 benefits make up 89 percent, or KRW 4.6 trillion, of the increased spending, while Class-2 benefits make up only KRW 0.5 trillion or so. Whereas Class-1 benefit spending has been on a consistent rise, Class-2 spending has rather been decreasing since 2009, as near-poverty patients with Class-1 or 2 rare diseases and children were once again placed under NHI. Hospitalization costs, of which Medicaid beneficiaries need not pay anything, amounted to KRW 2.7 trillion, or 51 percent of the total Medicaid spending, while outpatient and drug costs, respectively, amounted to KRW 1.5 trillion and KRW 0.9 trillion. Again, Class-1 Medicaid beneficiaries account for most of these costs, i.e., KRW 2.6 trillion of hospitalization costs, KRW 1.3 trillion of outpatient costs, and KRW 0.8 trillion of drug costs. By contrast, costs for hospitalization, outpatient, and drugs for Class-2 Medicaid beneficiaries have been steadily decreasing since 2009

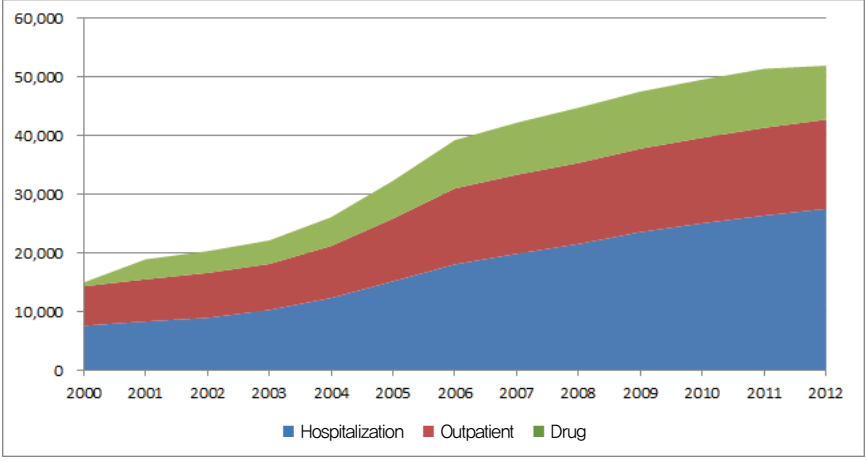
[Figure II-1] **Trends in Medicaid Spending for Different Classes of Beneficiaries**

(Unit: KRW 100 million)



[Figure II-2] **Trends in Different Types of Medicaid Expenses**

(Unit: KRW 100 millions)

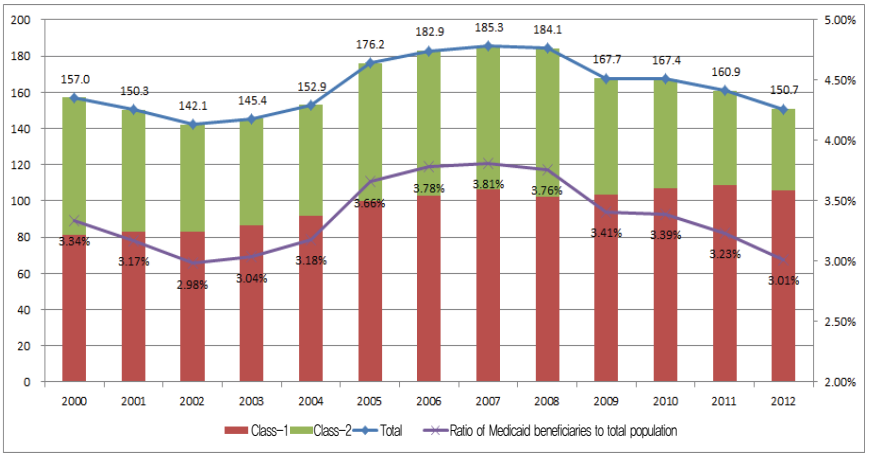


2 Increasing use of medical services and care by Medicaid beneficiaries

There can be multiple causes for the rise in the amount of Medicaid spending. These may include the increasing number of Medicaid beneficiaries, the rising costs of medical treatments and services, and the expanding number of services and treatments per beneficiary. However, we need to remember that the number of Medicaid beneficiaries has rather decreased, from 1.57 million in 2000 to 1.507 million in 2012 as near-poverty beneficiaries were brought back into the scope of NHI in 2009. Therefore, we should see the steady increase in the amount of Medicaid spending between 2000 and 2012 as stemming from the other two of the three causes we listed above. As a matter of fact, the costs of medical services and treatments have increased by different degrees over the years, rising by 1.94 percent in 2008, 2.22 percent in 2009, 2.05 percent in 2010, and 1.64 percent in 2011. In the meantime, however, the amount of Medicaid spending continued to grow at rates ranging from 4 to 8 percent each year, well in excess of the pace at which medical service and treatment costs

[Figure II-3] **Composition of Medicaid Beneficiaries**

(Unit: 10,000 persons)



Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

〈Table II-2〉 **Composition of Medicaid Beneficiaries Aged 65 or Older**

(Unit: number of persons, %)

Year	Total		Class-1		Class-2	
	65+	Ratio	65+	Ratio	65+	Ratio
2001	371,664	24.7	329,408	39.6	42,256	6.3
2002	374,365	26.4	340,135	41.0	34,230	5.8
2003	391,848	27.0	361,176	41.6	30,672	5.2
2004	415,346	27.2	381,244	41.5	34,102	5.6
2005	452,480	25.7	404,728	40.6	47,752	6.2
2006	469,374	25.7	413,826	40.2	55,548	6.9
2007	489,056	26.4	429,816	40.5	56,240	7.1
2008	486,633	26.4	426,921	41.7	59,712	7.3
2009	459,941	27.4	436,614	42.1	23,327	3.6
2010	470,227	28.1	449,201	41.9	21,026	3.5
2011	460,371	28.6	443,896	40.8	16,475	3.2
2012	454,116	30.1	440,520	41.6	13,596	3.0

Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

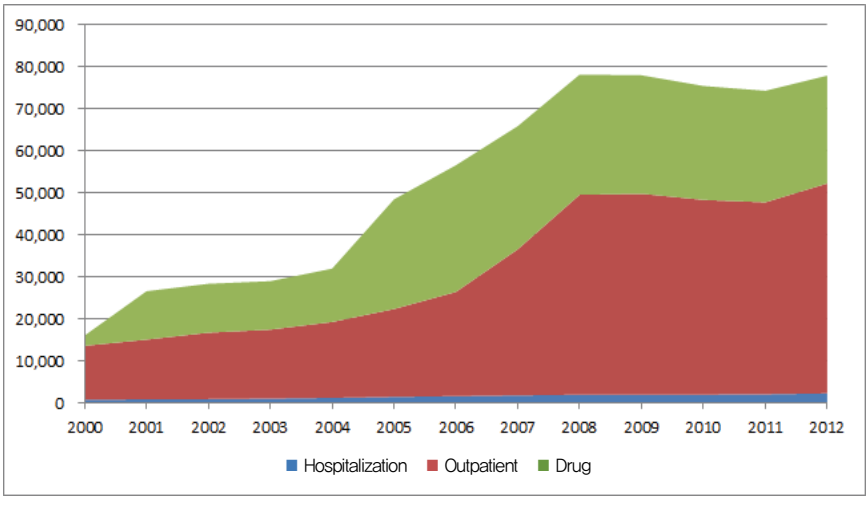
increased. These facts point to the rising and excessive use of medical services by Medicaid beneficiaries as the only probable cause for the expansion in the amount of Medicaid spending.

A. Number of medical services or treatments provided: Total and per beneficiary

The total number of medical services and treatments provided for Medicaid beneficiaries grew at a rate of 14.1 percent year-on-year between 2000 and 2012, which is far higher than the rate at which the costs of medical services and treatments increased. More specifically, the number of medical services and treatments provided for Medicaid beneficiaries multiplied from 16 million in 2000 to 78 million in 2012. The inclusion of near-poverty patients and children as Medicaid beneficiaries from 2004 to 2009 may account for this dramatic increase to some extent. Interestingly, however, the number of medical services and treatments provided kept expanding from 2010 onwards. In the meantime,

[Figure II-4] **Trends in the Number of Medical Services and Treatments Provided for Medicaid Beneficiaries**

(Unit: 1,000s)

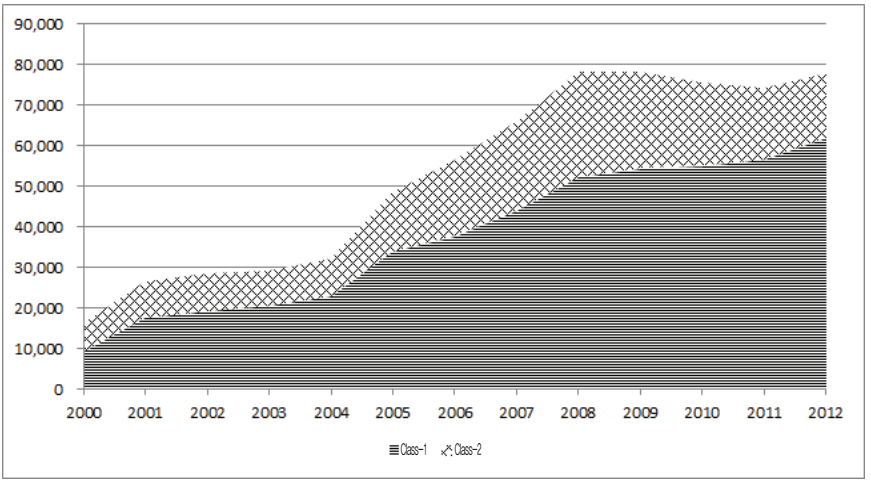


Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

the ratio of eligible Medicaid beneficiaries receiving medical services and treatments similarly multiplied from 10 percent in 2000 to 52 percent in 2012, even after near-poverty beneficiaries were excluded in 2010 and particularly with respect to outpatient services and drug treatments. Whereas the total ratio of Medicaid beneficiaries seeking medical services and treatments increased at a rate of 14.5 percent each year, the ratios of outpatients and drug patients grew by 12.4 percent and 22.2 percent, respectively. The number and ratio of Medicaid beneficiaries seeking hospitalization services and treatments should be lower than those of the other two types. Between 2000 and 2012 the number and ratio of hospitalized Medicaid beneficiaries grew by 9.1 percent and 9.5 percent, respectively. This is especially significant when we consider the sheer costs of hospitalization.

[Figure II-5] **Trends in the Number of Medical Services and Treatments Provided for Medicaid Beneficiaries by Class**

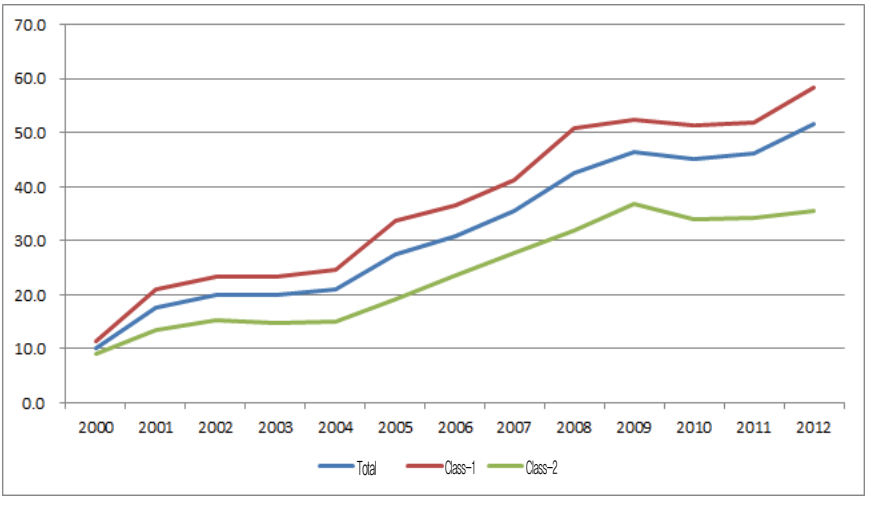
(Unit: 1,000s)



Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

[Figure II-6] **Trends in the Ratios of Medicaid Beneficiaries Seeking Medical Services and Treatments by Class**

(Unit: number of services or treatments provided per patient)



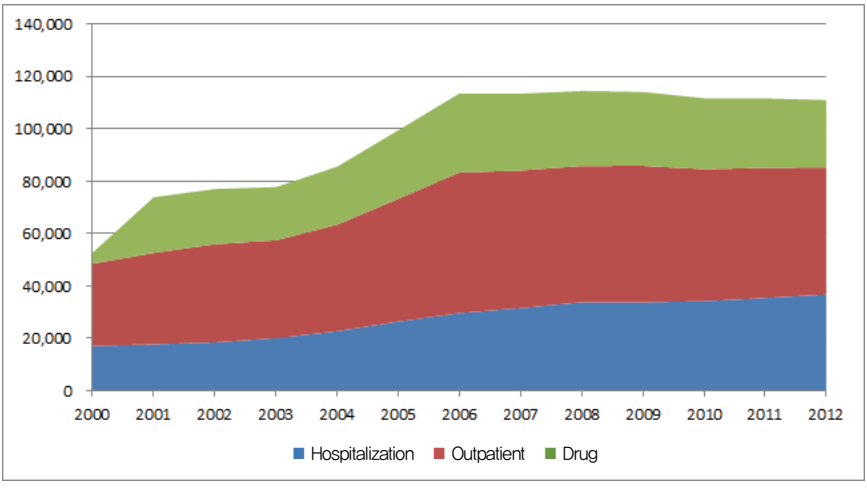
Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

B. Number of hospitalization days and outpatient visits: Total and per beneficiary

Another key indicator associated with the increase in Medicaid spending is the number of hospitalization days and outpatient visits. This number, like the number of medical services and treatments provided, has similarly been on the rise since 2000, even after the exclusion of the near-poverty group from Medicaid benefits in 2009. Whereas the number of medical services and treatments provided grew at 14.5 percent a year from 2000 to 2012, the number of hospitalization days and outpatient visits rose by 5.6 percent per year over the same period. However, the number of hospitalized patients grew more noticeably than the number of outpatients. The number of hospitalization days and outpatient visits per Medicaid beneficiary has also been on the rise since 2009, growing at a rate of about 6 percent yearly, with the margin of increase more prominent in hospitalization days than in outpatient visits.

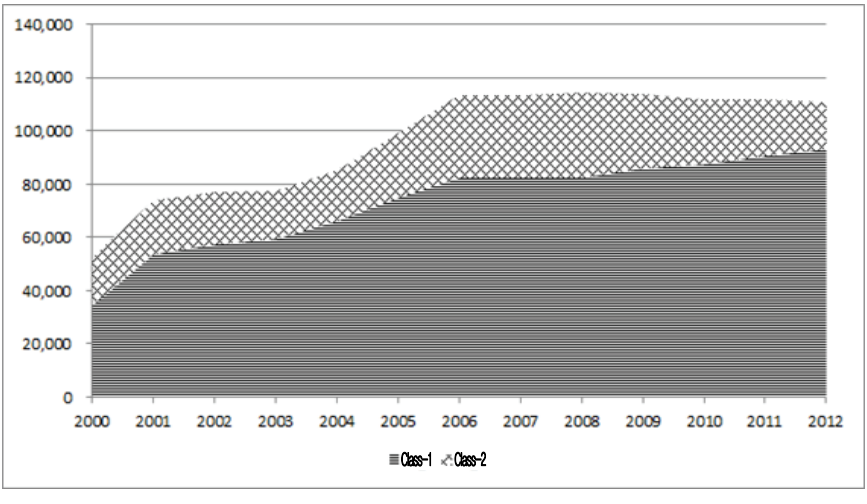
[Figure II-7] **Trends in the Number of Hospitalization Days and Outpatient Visits by Patient Type**

(Unit: 1,000 days)



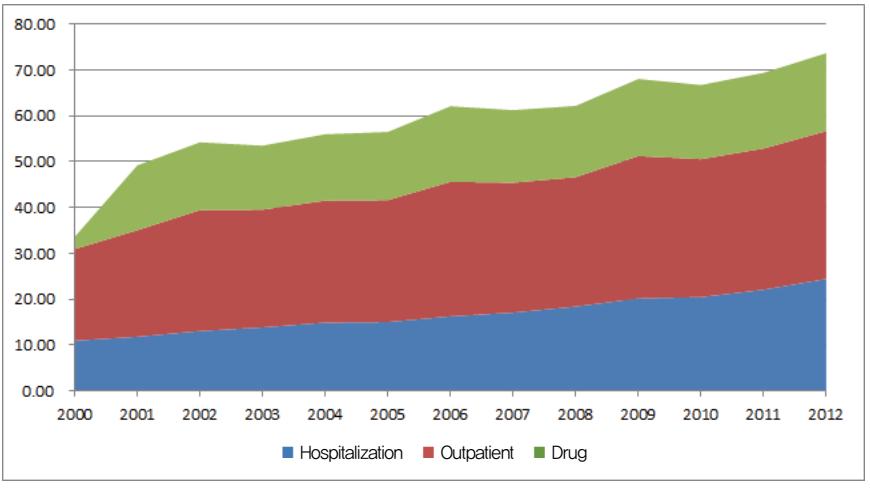
[Figure II-8] **Trends in the Number of Hospitalization Days and Outpatient Visits by Class**

(Unit: 1,000 days)



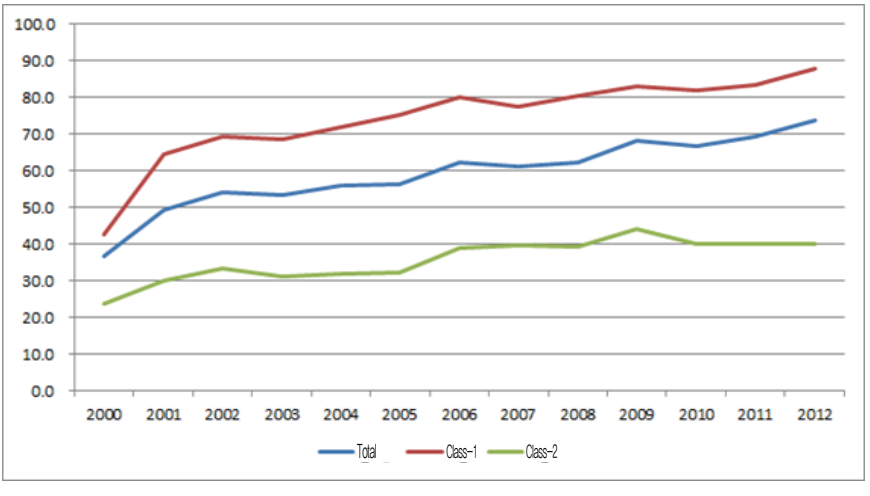
[Figure II-9] **Trends in the Number of Hospitalization Days and Outpatient Visits per Beneficiary**

(Unit: number of days per beneficiary)



[Figure II-10] **Trends in the Number of Hospitalization Days and Outpatient Visits per Beneficiary and by Class**

(Unit: number of days per beneficiary)



C. Number of patients visiting doctors' offices

The number of Medicaid beneficiaries visiting doctors' offices amounted to 1.68 million as of 2012, about 1.1 times greater than the total number of Medicaid beneficiaries, i.e., 1.51 million. Whereas the number of medical services and treatments provided has been on a steady rise, the overall number of Medicaid patients visiting doctors' offices has been decreasing since the near-poverty group left the pool of Medicaid beneficiaries. The decrease is especially prominent in the declining number of Class-2 Medicaid beneficiaries visiting doctors' offices. This is in contrast to the case of Class-1 beneficiaries, whose physician visits actually increased steadily over the years, taking up a 56 percent share in the total number of visits among all Medicaid beneficiaries in 2001 and rising to a 71 percent share in 2012. Moreover, while the number of outpatient visits and the amount of medications prescribed have been dropping since 2009, the pattern was reversed with the number of hospitalized patients. We may surmise the rapid rise in the number of hospitalized Class-1 Medicaid beneficiaries—who are not required to pay out of their pockets for their hospitalization—as a consequence of the very absence of that payment requirement.

3 Amount of medical expenses per capita for each age group

The elderly make up a significant part of the overall Medicaid beneficiary population, but it is also useful for us to examine the medical expenses of different age groups. <Table III-12> and [Figures III-3] and [III-4] compare per capita healthcare spending by age group, and reveal that the threshold age group in which the amount of medical spending per capita began to exceed the overall average amount of medical expenses per capita was Group 30-34 in the years leading up to 2009, moving to Group 40-44 in 2009 and 2010, and up again to Group 45-49 in 2011 and 2012. From this pattern we can justifiably predict that there will be a continuous rise in the amount of healthcare spending per capita in the future, as the Korean population ages. In general, the amount of medical spending per capita becomes significantly high by the time Medicaid beneficiaries enter their 50s.

〈Table II-3〉 **Medical Spending per Capita and Age Group (2000-2012)**

(Units: KRW 1,000 per capita, %)

Age	2000	2001	2002	2003	2004	2005	2006
Total	954.0 (100.0%)	1,259.0 (100.0%)	1,429.9 (100.0%)	1,523.5 (100.0%)	1,707.9 (100.0%)	1,835.7 (100.0%)	2,146.5 (100.0%)
0	583.3 (61.1%)	755.7 (60.0%)	1,079.3 (75.5%)	1,143.6 (75.1%)	1,196.6 (70.1%)	890.1 (48.5%)	1,422.6 (66.3%)
1–4	469.6 (49.2%)	706.2 (56.1%)	829.2 (58.0%)	785.9 (51.6%)	876.5 (51.3%)	651.2 (35.5%)	1,071.9 (49.9%)
5–9	252.6 (26.5%)	373.9 (29.7%)	431.3 (30.2%)	412.8 (27.1%)	452.5 (26.5%)	387.9 (21.1%)	526.4 (24.5%)
10–14	158.7 (16.6%)	228.8 (18.2%)	279.5 (19.5%)	275.5 (18.1%)	309.6 (18.1%)	330.7 (18.0%)	396.6 (18.5%)
15–19	179.1 (18.8%)	244.5 (19.4%)	289.4 (20.2%)	300.7 (19.7%)	330.8 (19.4%)	361.0 (19.7%)	418.7 (19.5%)
20–24	348.2 (36.5%)	458.4 (36.4%)	514.9 (36.0%)	566.6 (37.2%)	622.4 (36.4%)	683.5 (37.2%)	787.3 (36.7%)
25–29	894.4 (93.8%)	1,117.8 (88.8%)	1,295.5 (90.6%)	1,385.4 (90.9%)	1,509.5 (88.4%)	1,609.5 (87.7%)	1,819.4 (84.8%)
30–34	1,152.2 (120.8%)	1,355.2 (107.6%)	1,596.5 (111.6%)	1,721.2 (113.0%)	1,864.1 (109.1%)	1,994.6 (108.7%)	2,254.3 (105.0%)
35–39	1,145.9 (120.1%)	1,372.6 (109.0%)	1,592.1 (111.3%)	1,681.7 (110.4%)	1,845.5 (108.1%)	1,975.2 (107.6%)	2,180.6 (101.6%)
40–44	1,204.5 (126.3%)	1,466.9 (116.5%)	1,692.6 (118.4%)	1,817.3 (119.3%)	2,025.6 (118.6%)	2,180.9 (118.8%)	2,445.4 (113.9%)
45–49	1,397.6 (146.5%)	1,746.2 (138.7%)	1,982.0 (138.6%)	2,113.9 (138.8%)	2,388.4 (139.8%)	2,578.4 (140.5%)	2,886.4 (134.5%)
50–54	1,566.0 (164.2%)	1,965.3 (156.1%)	2,183.3 (152.7%)	2,355.3 (154.6%)	2,651.8 (155.3%)	2,964.9 (161.5%)	3,385.8 (157.7%)
55–59	1,571.9 (164.8%)	2,019.2 (160.4%)	2,256.7 (157.8%)	2,329.3 (152.9%)	2,590.3 (151.7%)	2,956.7 (161.1%)	3,532.0 (164.5%)
60–64	1,339.4 (140.4%)	1,881.6 (149.5%)	2,060.0 (144.1%)	2,178.9 (143.0%)	2,451.9 (143.6%)	2,835.4 (154.5%)	3,392.0 (158.0%)
65–69	1,323.2 (138.7%)	1,918.1 (152.4%)	2,178.5 (152.3%)	2,163.3 (142.0%)	2,339.7 (137.0%)	2,696.5 (146.9%)	3,215.4 (149.8%)
70–74	1,630.4 (170.9%)	1,968.6 (156.4%)	2,145.9 (150.1%)	2,405.7 (157.9%)	2,692.1 (157.6%)	2,985.3 (162.6%)	3,392.2 (158.0%)
75 and above	1,222.9 (128.2%)	1,732.8 (137.6%)	1,800.2 (125.9%)	1,939.0 (127.3%)	2,236.5 (130.9%)	2,626.6 (143.1%)	3,217.1 (149.9%)

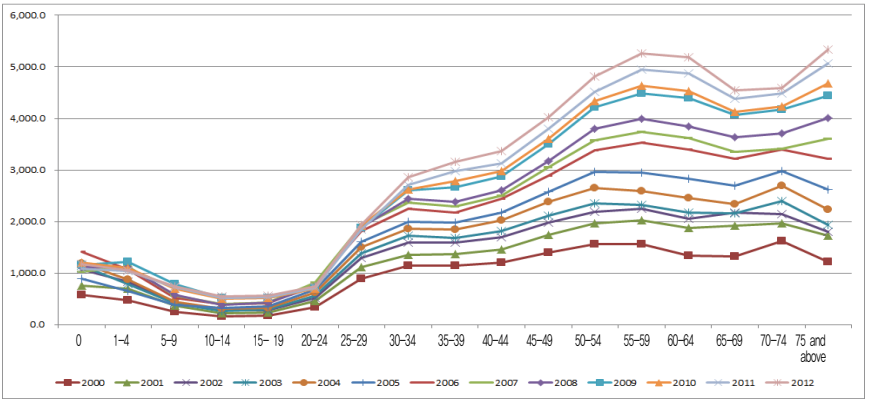
〈Table II-3〉 **Continued**

Age	2000	2001	2002	2003	2004	2005
Total	2,279.8 (100.0%)	2,432.4 (100.0%)	2,834.9 (100.0%)	2,961.2 (100.0%)	3,195.0 (100.0%)	3,447.1 (100.0%)
0	1,028.3 (45.1%)	1,114.0 (45.8%)	1,166.0 (41.1%)	1,207.8 (40.8%)	1,089.0 (34.1%)	1,176.2 (34.1%)
1–4	1,125.2 (49.4%)	1,110.6 (45.7%)	1,221.7 (43.1%)	1,097.9 (37.1%)	1,048.2 (32.8%)	1,053.6 (30.6%)
5–9	567.5 (24.9%)	581.5 (23.9%)	791.6 (27.9%)	703.3 (23.8%)	726.7 (22.7%)	751.9 (21.8%)
10–14	403.0 (17.7%)	394.3 (16.2%)	521.0 (18.4%)	500.4 (16.9%)	519.9 (16.3%)	547.3 (15.9%)
15–19	431.3 (18.9%)	437.0 (18.0%)	515.5 (18.2%)	514.4 (17.4%)	536.1 (16.8%)	564.0 (16.4%)
20–24	821.1 (36.0%)	745.4 (30.6%)	714.1 (25.2%)	705.6 (23.8%)	721.7 (22.6%)	749.8 (21.8%)
25–29	1,924.5 (84.4%)	1,887.1 (77.6%)	1,870.1 (66.0%)	1,925.3 (65.0%)	1,848.1 (57.8%)	1,937.6 (56.2%)
30–34	2,362.3 (103.6%)	2,437.4 (100.2%)	2,607.0 (92.0%)	2,626.5 (88.7%)	2,714.5 (85.0%)	2,860.0 (83.0%)
35–39	2,287.4 (100.3%)	2,380.8 (97.9%)	2,665.3 (94.0%)	2,779.6 (93.9%)	2,981.8 (93.3%)	3,159.5 (91.7%)
40–44	2,498.3 (109.6%)	2,610.6 (107.3%)	2,868.7 (101.2%)	2,982.0 (100.7%)	3,125.3 (97.8%)	3,373.4 (97.9%)
45–49	3,047.4 (133.7%)	3,172.1 (130.4%)	3,501.1 (123.5%)	3,612.4 (122.0%)	3,805.8 (119.1%)	4,023.0 (116.7%)
50–54	3,577.5 (156.9%)	3,796.7 (156.1%)	4,217.2 (148.8%)	4,333.8 (146.4%)	4,508.5 (141.1%)	4,819.2 (139.8%)
55–59	3,742.8 (164.2%)	4,000.0 (164.4%)	4,483.1 (158.1%)	4,638.7 (156.6%)	4,948.2 (154.9%)	5,265.5 (152.8%)
60–64	3,627.3 (159.1%)	3,840.3 (157.9%)	4,394.7 (155.0%)	4,530.9 (153.0%)	4,866.8 (152.3%)	5,181.5 (150.3%)
65–69	3,354.3 (147.1%)	3,638.6 (149.6%)	4,062.4 (143.3%)	4,128.3 (139.4%)	4,376.6 (137.0%)	4,541.0 (131.7%)
70–74	3,414.6 (149.8%)	3,704.1 (152.3%)	4,168.1 (147.0%)	4,234.3 (143.0%)	4,488.0 (140.5%)	4,588.3 (133.1%)
75 and above	3,609.5 (158.3%)	4,002.6 (164.6%)	4,436.8 (156.5%)	4,672.1 (157.8%)	5,066.7 (158.6%)	5,329.8 (154.6%)

Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

[Figure II-11] **Trends in Medical Spending Per Capita and Age Group (2000-2012)**

(Unit: KRW 1,000 per capita)



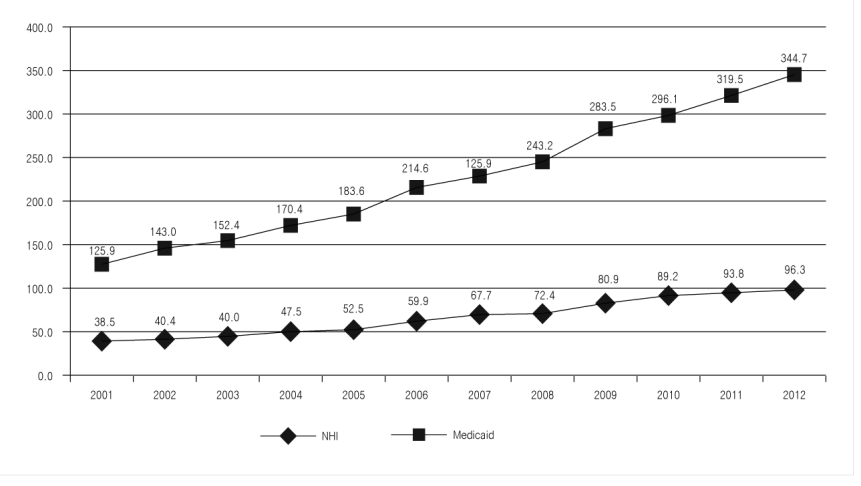
4 Problems with the current Medicaid spending structure

If we compare Medicaid spending to that of NHI, we can clearly see the excessive nature of the former. In 2012 Medicaid spending amounted to KRW 5.2 trillion in total for approximately 1.5 million beneficiaries, who made up only 3 percent or so of the total national population at that time. NHI spending, in the meantime, amounted to KRW 48 trillion for 49.66 million people, or 99.3 percent of the national population. NHI spending per capita came to KRW 960,000 in 2012, whereas Medicaid spending per capita amounted to KRW 3.48 million, almost 3.6 times its NHI counterpart. Moreover, Medicaid spending per capita grew at a yearly rate of 9.6 percent compared to the 8.7 percent of NHI. Subtract out-of-pocket expenses, and Medicaid spending per capita amounted to KRW 3.39 million, almost 4.7 times greater than NHI spending per capita at KRW 720,000.

Medicaid spending per capita is much higher than that of its NHI counterpart mainly because Medicaid beneficiaries are much more likely to seek medical services and treatments. Whereas the combined number of hospitalization days and outpatient visits per NHI holder amounts to 19 days, the figure rises almost four times to 74 days for a typical Medicaid beneficiary.

[Figure II-12] Comparison of Total Spending per Capita: NHI vs. Medicaid

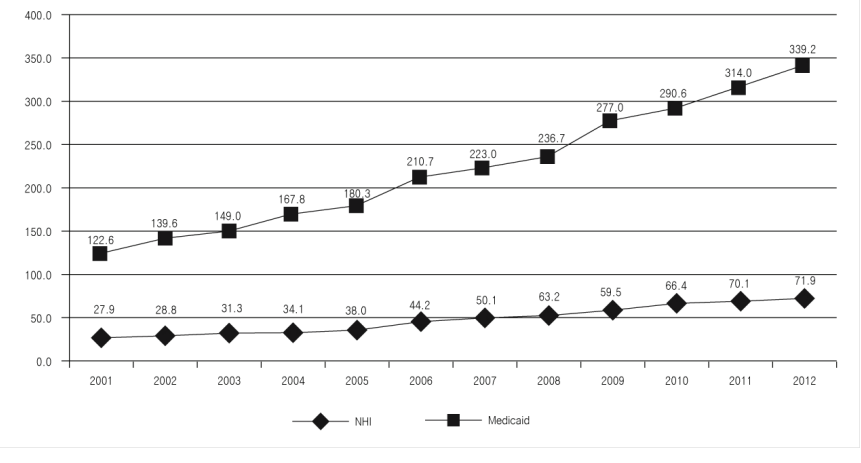
(Unit: KRW 10,000 per capita)



Sources: NHIS, *Yearbooks on Medical Benefits Statistics*, each year; *Yearbooks on National Health Insurance Statistics*, each year

[Figure II-13] Comparison of Benefits per Capita: NHI vs. Medicaid

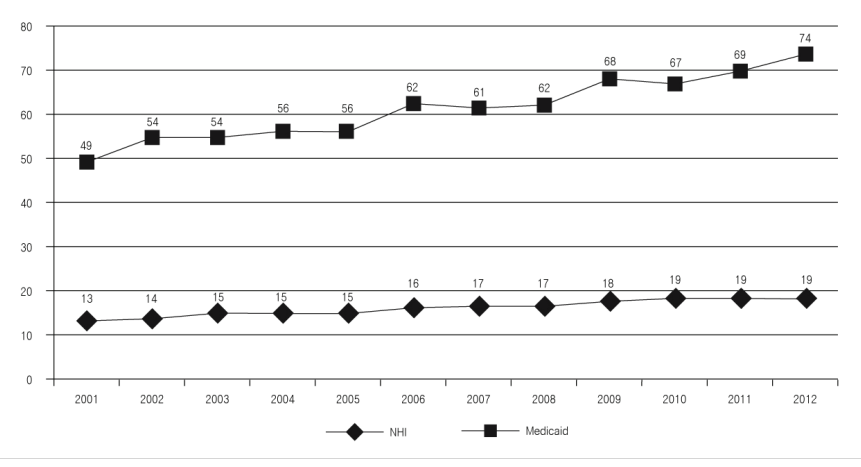
(Unit: KRW 10,000 per capita)



Sources: NHIS, *Yearbooks on Medical Benefits Statistics, each year; Yearbooks on National Health Insurance Statistics*, each year

[Figure II-14] **Comparison of the Number of Hospitalization Days and Outpatient Visits per Capita/Year: NHI vs. Medicaid**

(Unit: number of days per capita)



Sources: NHIS, *Yearbooks on Medical Benefits Statistics*, each year; *Yearbooks on National Health Insurance Statistics*, each year

Even while considering that the elderly aged 65 or older make up a significant portion of Medicaid beneficiaries, along with patients of chronic diseases, the figure remains staggeringly high.

In turn, the radical increases in total Medicaid spending and benefits per capita reflect the excessive amounts of hospitalization-related expenses of Medicaid beneficiaries. Over 50 percent of total Medicaid spending goes toward hospitalization. Medicaid beneficiaries have a tendency toward long-term hospitalization. Though this tendency appears to suggest the inadequacy of the care they receive in hospitals, it is in fact a direct result of the absence of out-of-pocket payment requirements on hospitalization driving up demand. NHI subscribers spend about 10 days hospitalized each year, with 85 percent of NHI subscribers staying in hospitals between one and 15 days. By contrast, 16 percent of Medicaid beneficiaries spend at least 100 days a year in hospitals, and only 56 percent of Medicaid beneficiaries spend 20 days or fewer a year (Kim, 2013). The average number of days Medicaid beneficiaries spend hospitalized each year is 83 days, almost 4.6 times the 18 days of NHI subscribers. NHI subscribers

with illnesses that require outpatient/recovery facility care rather than hospitalization are required to pay 40 percent of their medical expenses. On the other hand, Class-1 Medicaid beneficiaries are not required to pay for any part of their hospitalization expenses. This is another source of the excessively high hospitalization rate among Medicaid beneficiaries (Kim, 2013). Medicaid beneficiaries, because they are only required to pay a mere KRW 500 each for the medications they are prescribed, receive far more expensive prescriptions, take the prescribed medications much longer, and ingest a much wider range of medications than their NHI counterparts. The overlapping administration of medicines and the black-market trading of prescription drugs also remain critical issues among Medicaid beneficiaries.

Another key problem with Medicaid is that its beneficiaries tend to receive more benefits than are legally due. Article 8.3 and Appendix 1 of the Enforcement Rules for the MAAA limit the number of days Medicaid beneficiaries can claim their benefits. Medical services and treatments for 107 rare and severe diseases, and for 11 chronic diseases including mental and behavioral disorders, are to be provided for one year. Medical services and treatments for a Medicaid patient with any of these diseases who is past the maximum number of legally limited benefit days may receive up to 90 additional days of care if his or her application for extension is approved. For all other diseases, the one-year limit applies, renewable twice for up to 90 days each time. Patients who have received one year of benefits can claim additional benefits only from or via select medical institutions. However, the extension requirements and the select-medical-institution rule are not enforced seriously, with only 10 percent of the subject patients using the select medical institutions and the rest going elsewhere. The law does not provide for effective sanctions against this kind of violation (Kim, 2013). The select-medical-institution rule was originally introduced for the purpose of encouraging Medicaid patients to maintain steady relationships with their family doctors. Therefore, the current Medicaid system exempts patients frequenting the select medical institutions from paying expenses regardless of whether they are past their maximum benefit days. This institutional arrangement, however, has rather served to drive up the demand and fuel the moral hazards prevalent among Medicaid beneficiaries (Kim, 2013).

Ⅲ

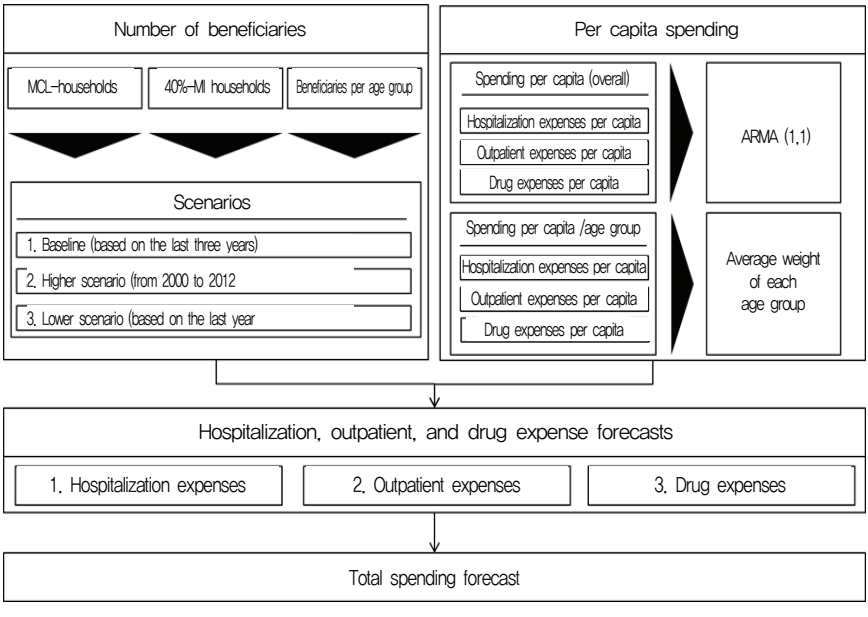
Medical Spending Forecasts

1 Medicaid spending forecast model

The body of established literature on Medicaid spending is surprisingly small, especially in comparison to the vast amount of literature on national healthcare expenditure and NHI spending. Medicaid benefits target low-income households and certain beneficiaries of other social assistance programs. Therefore, we must first make forecasts on the future distribution of income levels in Korea. The Medicaid spending forecast model used in this study consists of two modules. The first module enables forecasting changes in the number of Medicaid beneficiaries, while the second enables predicting changes in the amount of Medicaid benefits per capita. The total amount of Medicaid spending can be obtained by multiplying the products of the two modules together. We can forecast the number of Medicaid beneficiaries by predicting the number of subject households. Until now, Medicaid has chiefly targeted households earning less than the minimum cost of living (MCL). From now on, however, it will include households earning 40 percent or less of the median income. The two-module forecast model was used to estimate the numbers of both the less-than-MCL households and the 40-percent-or-less-of-median-income (40%-MI) households. As the elderly aged 65 and older make up a significant portion of Medicaid beneficiaries, this study also applies the forecast model to derive estimates on the size of each age group of beneficiaries. As for the number of household beneficiaries of Medicaid, this study uses the composition of

households over the last three years as the baseline, the makeup of households over the last decade in a higher-level scenario, and the composition of households over the last year in a lower-level scenario. This study also divides per capita Medicaid spending estimates into three types (i.e., hospitalization, outpatient, and drug expenses), and then adds them together to estimate total Medicaid spending per capita.

[Figure III-1] **Medicaid Spending Forecast Model**



2 Forecasts on the number of Medicaid beneficiaries

A. Forecasts on the number of Medicaid beneficiaries: Based on the minimum cost of living (MCL)

Even though the Medicaid program will be restructured shortly to benefit not only households earning the MCL or less a year, but also all households earning up to 40 percent of the median income, the majority of the households that will benefit under the new scheme will remain the same as those under the former one. With this underlying assumption, this study first estimates the number of household beneficiaries of NBLSP earning the MCL or less a year to determine the baseline number of Medicaid beneficiaries, and then applies that estimate to Medicaid spending per capita forecasts. Forecasts on the number of household beneficiaries of NBLSP first involve estimating the respective ratios of different-sized households receiving NBLSP benefits to the total number of different-sized households, and then applying those ratios to the number of household members estimated by Statistics Korea. <Table IV-2> posits the average ratios of different-sized NBLSP-supported households over the last three years (2009 to 2012) as the baseline ratios; the average ratios of different-sized NBLSP-supported households over the last 10 years (2002 to 2012) as the higher scenario; and the average ratios of different-sized NBLSP-supported households over the last year (2012) as the lower scenario. We then multiply the number of NBLSP-supported households by the number of members in each household to obtain estimates on the number of individual Medicaid beneficiaries. Individual Medicaid beneficiaries, however, include both the members of NBLSP-supported households and other-type beneficiaries of other social assistance programs. The "other type" beneficiaries subject to Medicaid from 2004 to 2008 were near-poverty households, but they were brought back into NHI in 2008. Therefore, the estimates in the following sections are based on Medicaid data from 2009 onward. The following forecasts therefore assume that the ratio of other-type beneficiaries in Medicaid will remain consistent with the average ratio observed from 2009 to 2012. <Table IV-7> provides forecasts on the number of Medicaid beneficiaries in all three scenarios (i.e., baseline, higher, and lower). This study forecasts that the number of Medicaid beneficiaries will rise to

2,000,000 or so by 2035 in the baseline scenario, and to 2.4 million and 1.7 million in the higher and lower scenarios, respectively, by 2035.

〈Table III-1〉 **Ratios of NBLSP-Supported Households in Different-Sized Households**

(Unit: %)

Benefit ratio	Single households	House holds of 2	House holds of 3	House holds of 4	House holds of 5	House holds of 6	Total number of households
2001	14.44	5.09	3.42	1.38	1.41	1.63	4.70
2002	14.10	4.68	3.09	1.21	1.23	1.47	4.56
2003	14.17	4.53	3.04	1.17	1.18	1.42	4.64
2004	14.21	4.50	3.07	1.19	1.21	1.49	4.79
2005	14.53	4.55	3.23	1.28	1.34	1.65	5.07
2006	14.29	4.45	3.17	1.28	1.36	1.69	5.11
2007	14.36	4.32	2.99	1.22	1.29	1.63	5.15
2008	14.00	4.09	2.82	1.17	1.28	1.61	5.09
2009	13.90	4.06	2.81	1.21	1.34	1.68	5.18
2010	13.23	3.90	2.68	1.19	1.33	1.70	5.06
2011	12.48	3.59	2.40	1.08	1.23	1.66	4.81
2012	11.92	3.26	2.11	0.97	1.13	1.55	4.58
Over last 3 years (baseline)	12.54	3.58	2.40	1.08	1.23	1.64	4.82
Average (higher)	13.80	4.25	2.90	1.20	1.28	1.60	4.89
2012 (lower)	11.92	3.26	2.11	0.97	1.13	1.55	4.58

Note: The estimated number of NBLSP-supported households in each household size was divided by the projected total number of households of each size

〈Table III-2〉 **Estimates on the Numbers of Different-Sized Households**

(Unit: number of households)

Year	Single households	House holds of 2	House holds of 3	House holds of 4	House holds of 5	House holds of 6	Total number of households
2015	5,060,551	4,990,573	3,988,237	3,521,897	888,051	255,695	18,705,004
2016	5,230,202	5,142,880	4,035,174	3,442,983	852,583	244,520	18,948,342
2017	5,398,263	5,294,741	4,078,462	3,363,660	818,272	233,909	19,187,307
2018	5,563,449	5,447,678	4,118,691	3,283,085	784,805	223,774	19,421,482
2019	5,722,473	5,602,017	4,155,640	3,203,087	752,834	214,310	19,650,361
2020	5,876,740	5,759,043	4,187,904	3,125,567	723,357	205,788	19,878,399
2021	6,027,684	5,914,687	4,219,236	3,051,511	695,577	197,729	20,106,424
2022	6,175,487	6,068,978	4,249,733	2,980,783	669,379	190,102	20,334,462
2023	6,314,740	6,221,493	4,275,786	2,908,982	644,097	182,883	20,547,981
2024	6,442,808	6,373,179	4,299,521	2,837,242	619,645	176,085	20,748,480
2025	6,560,883	6,522,763	4,320,903	2,766,826	596,259	169,705	20,937,339
2026	6,671,074	6,666,605	4,339,831	2,698,803	574,055	163,688	21,114,056
2027	6,777,282	6,799,961	4,354,943	2,633,576	553,158	157,968	21,276,888
2028	6,882,207	6,925,416	4,366,297	2,570,458	533,598	152,583	21,430,559
2029	6,987,252	7,045,338	4,373,913	2,508,963	515,179	147,442	21,578,087
2030	7,091,247	7,158,087	4,377,359	2,449,521	497,835	142,540	21,716,589
2031	7,192,420	7,262,604	4,376,804	2,392,857	481,576	137,860	21,844,121
2032	7,299,243	7,357,014	4,369,785	2,338,903	466,340	133,368	21,964,653
2033	7,406,849	7,441,713	4,357,084	2,287,587	452,188	129,105	22,074,526
2034	7,515,433	7,515,819	4,339,872	2,238,162	438,776	124,973	22,173,035
2035	7,628,065	7,578,969	4,317,612	2,189,530	425,582	120,845	22,260,603

Source: Statistics Korea, *Estimates on the Number of Future Households*

〈Table III-3〉 **Estimates on the Number of Other-Type Medicaid Beneficiaries**

(Unit: number of persons)

	Number of other-type beneficiaries	Rate of yearly increase/decrease
2015	136,734	–
2016	137,232	0.36%
2017	137,705	0.34%
2018	138,148	0.32%
2019	138,561	0.30%
2020	138,944	0.28%
2021	139,298	0.25%
2022	139,620	0.23%
2023	139,905	0.20%
2024	140,166	0.19%
2025	140,395	0.16%
2026	140,583	0.13%
2027	140,724	0.10%
2028	140,824	0.07%
2029	140,886	0.04%
2030	140,902	0.01%
2031	140,864	–0.03%
2032	140,780	–0.06%
2033	140,631	–0.11%
2034	140,429	–0.14%
2035	140,168	–0.19%

Note: Applies the average ratio of other-type beneficiaries in total population estimates

〈Table III-4〉 **Estimates on the Number of Medicaid Beneficiaries (Based on the MCL)**

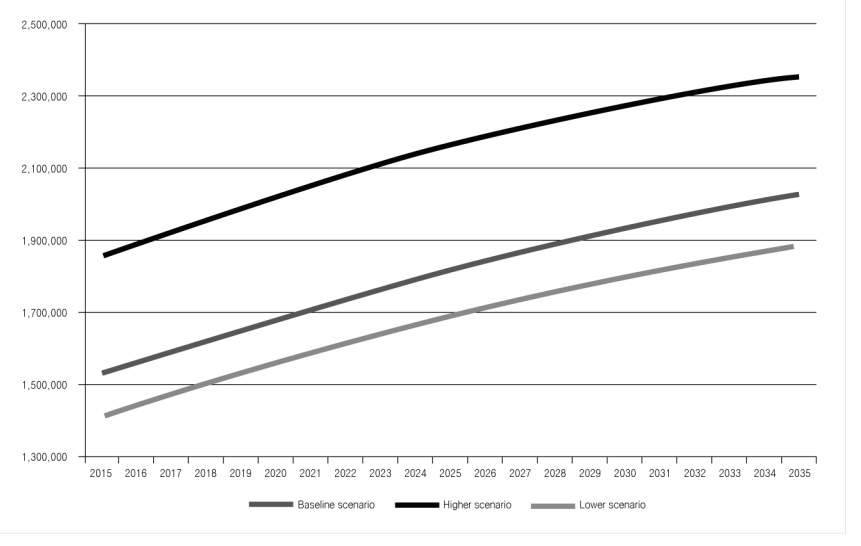
(Unit: number of persons)

	Baseline scenario		Higher scenario		Lower scenario	
	Total number of beneficiaries	Ratio of beneficiaries earning MCL or less a year	Total number of beneficiaries	Ratio of beneficiaries earning MCL or less a year	Total number of beneficiaries	Ratio of beneficiaries earning MCL or less a year
2015	1,528,016	1,391,282	1,856,598	1,719,864	1,416,872	1,280,138
2016	1,559,138	1,421,906	1,890,440	1,753,208	1,445,982	1,308,750
2017	1,589,690	1,451,985	1,923,790	1,786,085	1,474,581	1,336,876
2018	1,619,847	1,481,699	1,956,578	1,818,430	1,502,820	1,364,672
2019	1,649,560	1,510,998	1,988,507	1,849,946	1,530,647	1,392,086
2020	1,678,825	1,539,880	2,019,939	1,880,995	1,558,062	1,419,117
2021	1,707,675	1,568,377	2,051,002	1,911,704	1,585,099	1,445,801
2022	1,736,035	1,596,415	2,081,714	1,942,094	1,611,681	1,472,061
2023	1,763,633	1,623,727	2,110,718	1,970,813	1,637,546	1,497,640
2024	1,790,817	1,650,652	2,137,977	1,997,811	1,663,021	1,522,855
2025	1,817,688	1,677,293	2,163,613	2,023,218	1,688,193	1,547,798
2026	1,844,250	1,703,666	2,187,643	2,047,060	1,713,067	1,572,484
2027	1,869,294	1,728,571	2,210,097	2,069,373	1,736,525	1,595,801
2028	1,892,766	1,751,942	2,231,553	2,090,729	1,758,497	1,617,673
2029	1,914,789	1,773,903	2,252,365	2,111,479	1,779,104	1,638,217
2030	1,935,401	1,794,499	2,272,203	2,131,301	1,798,387	1,657,485
2031	1,954,664	1,813,800	2,290,772	2,149,908	1,816,427	1,675,562
2032	1,973,090	1,832,310	2,308,866	2,168,086	1,833,701	1,692,921
2033	1,990,964	1,850,333	2,325,900	2,185,269	1,850,477	1,709,846
2034	2,008,018	1,867,589	2,341,872	2,201,443	1,866,505	1,726,076
2035	2,023,990	1,883,822	2,357,024	2,216,856	1,881,537	1,741,369

Note: Estimates on the size of the population earning the MCL or less a year and estimates on the number of other-type beneficiaries have been added up in each scenario

[Figure III-2] **Forecasts on the Total Number of Medicaid Beneficiaries (Based on the MCL)**

(Unit: number of persons)

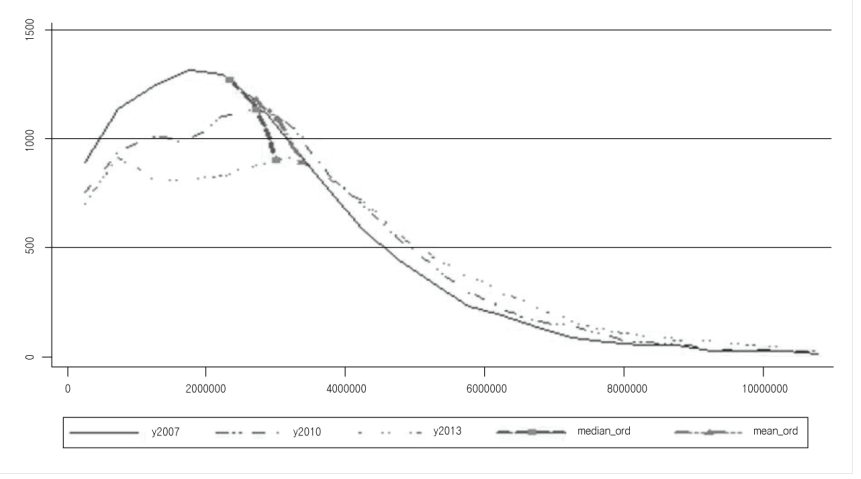


B. Forecasts on the number of Medicaid beneficiaries: Based on the median income

Medicaid will be soon extended to benefit all households in Korea earning up to 40 percent of the median income. Assuming that the ratio of households earning up to 40 percent of the median income (40%-MI households) indicated in Statistics Korea's data on household trends will remain more or less consistent into the future, this study sought to forecast changes in the future number of Medicaid beneficiaries. The threshold, 40 percent of the median income, was deliberately adopted as it benefits a slightly greater number of households than did the previous MCL rule. According to Statistics Korea, the number of 40%-MI households amounted to approximately 1.04 times the number of MCL-or-less-arning households in 2012.

[Figure III-3] Household Income Distribution: Median Income and Average Income (Based on Current Income)

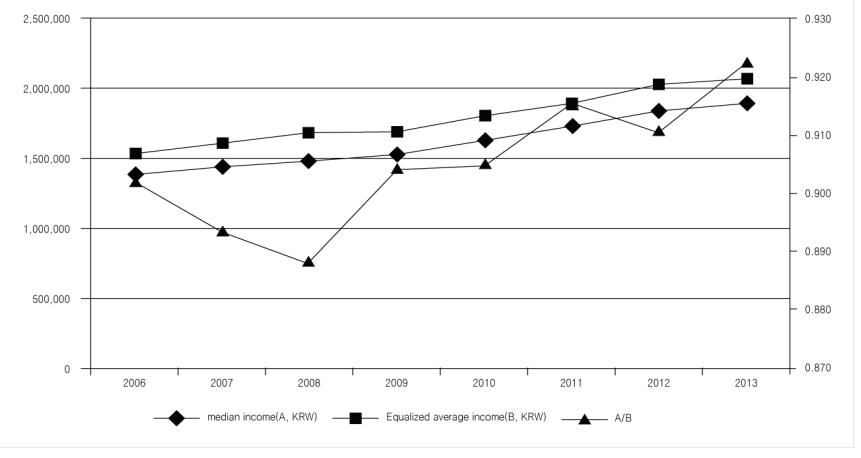
(Units: KRW, frequency)



Source: Statistics Korea, *Household Trend Reports*, each year

[Figure III-4] Trends in Median Income and Average Income (Based on Market Income)

(Unit: KRW)



Source: Statistics Korea, *Household Trend Reports*, each year

〈Table III-5〉 **Distribution of 40%-MI Households of Different Sizes**

(Unit: number of persons)

	Household size	Market income) ≤Median income 40%	Disposable income ≤ Median income 40%	Current income ≤ Median income 40%
2006	36,512	4,017	3,195	3,283
	(100.00%)	(11.00%)	(8.75%)	(8.99%)
2007	31,614	3,481	2,743	2,812
	(100.00%)	(11.01%)	(8.68%)	(8.89%)
2008	31,583	3,536	2,683	2,777
	(100.00%)	(11.20%)	(8.50%)	(8.79%)
2009	31,484	3,816	2,803	2,878
	(100.00%)	(12.12%)	(8.90%)	(9.14%)
2010	30,792	3,902	2,796	2,864
	(100.00%)	(12.67%)	(9.08%)	(9.30%)
2011	30,528	3,844	2,785	2,817
	(100.00%)	(12.59%)	(9.12%)	(9.23%)
2012	29,079	5,199	2,906	2,773
	(100.00%)	(17.88%)	(9.99%)	(9.54%)

Source: Statistics Korea, *Household Trend Reports*, each year

The number of Medicaid beneficiaries, assuming that Medicaid has been extended to benefit all households earning up to 40 percent of the median income, was estimated using a process similar to the one used earlier. First, Statistics Korea's data on household trends were used to determine the average ratio of households earning up to 40 percent of the median income between 2006 and 2013. The baseline scenario assumes that this ratio will remain consistent into the future, akin to the assumption that the average income distribution will move yearly, but with no significant change in the shape of the curve itself. Given the fact that the median income amounted to 89 to 92 percent of the average market income, and 90 to 92 percent of the average disposable income, between 2006 and 2012, this assumption of a consistent ratio is not too far fetched. The higher scenario assumes that the ratio of 40%-MI households over the last 10 years will remain consistent into the future, while the lower scenario assumes

that the ratio from the last year alone (2013) will remain as it is. This study also assumes that the average ratio of other-type beneficiaries to the total number of households will remain consistent, as in the MCL model.

This study applies Statistics Korea's estimates on future household size to estimate the number of individual Medicaid beneficiaries earning up to 40 percent of the median income, and adds to these the estimated number of other-type beneficiaries. See <Table IV-14> for estimates on the number of beneficiaries in each scenario. According to the forecast model, the number of Medicaid beneficiaries will rise to 2.3 million, 2.5 million, and 2.0 million in the baseline, higher, and lower scenarios, respectively, by 2035. The 40%-MI model, in other words, shows slight increases in the estimated numbers of Medicaid beneficiaries in comparison to the MCL model.

〈Table III-6〉 **Estimated Ratios of 40%-MI Households of Different Sizes (Benefit Rates)**

(Unit: %)

Year	Single households	Households of 2	Households of 3	Households of 4	Households of 5	Households of 6
2006	19.67	4.90	2.92	1.09	0.97	1.15
2007	20.74	4.81	2.97	0.98	1.00	1.04
2008	19.66	4.41	2.77	0.90	0.93	1.07
2009	18.01	4.10	2.47	0.98	0.80	0.84
2010	16.65	4.28	2.67	1.01	1.04	0.94
2011	15.43	3.73	2.36	0.89	0.85	0.42
2012	15.59	3.47	2.13	0.89	0.71	0.97
2013	14.32	3.36	1.93	0.70	0.69	1.02
Over last 3 years (baseline)	15.89	3.82	2.38	0.93	0.86	0.78
Average (higher)	17.51	4.13	2.53	0.93	0.87	0.93
2012 (lower)	14.32	3.36	1.93	0.70	0.69	1.02

Note: Estimates have been recalibrated on the basis of the actual ratios of NBLSP beneficiaries indicated in Statistics Korea's *Household Trend Reports*

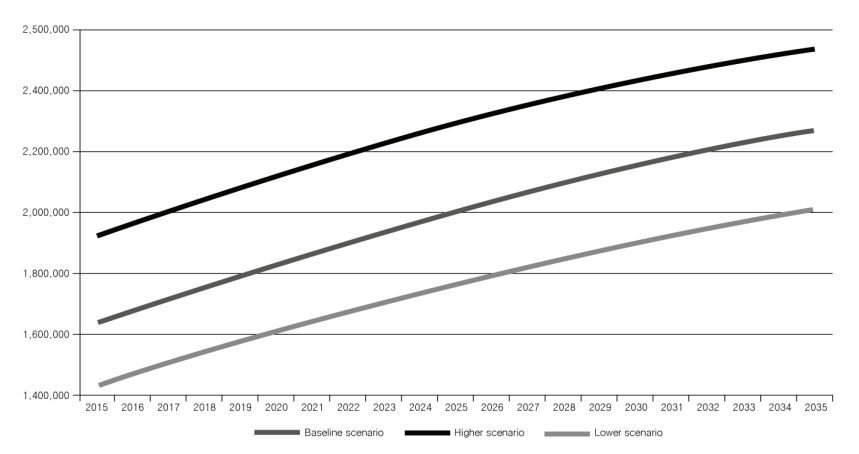
〈Table III-7〉 **Estimated Number of Medicaid Beneficiaries for Each Scenario (40%-MI Households)**

(Unit: number of persons)

	Baseline		Higher		Lower	
	Total beneficiaries	Beneficiaries earning less than 40% of median income	Total beneficiaries	Beneficiaries earning less than 40% of median income	Total beneficiaries	Beneficiaries earning less than 40% of median income
2015	1,635,909	1,499,176	1,921,727	1,784,993	1,435,498	1,298,765
2016	1,675,542	1,538,310	1,962,960	1,825,728	1,470,940	1,333,709
2017	1,714,553	1,576,848	2,003,642	1,865,937	1,505,876	1,368,171
2018	1,753,076	1,614,928	2,043,665	1,905,517	1,540,400	1,402,252
2019	1,791,014	1,652,453	2,082,571	1,944,010	1,574,417	1,435,856
2020	1,828,367	1,689,423	2,120,734	1,981,790	1,607,930	1,468,985
2021	1,865,205	1,725,907	2,158,331	2,019,033	1,641,007	1,501,709
2022	1,901,429	1,761,809	2,195,388	2,055,768	1,673,559	1,533,939
2023	1,936,628	1,796,723	2,230,450	2,090,545	1,705,205	1,565,300
2024	1,971,160	1,830,995	2,263,347	2,123,181	1,736,268	1,596,102
2025	2,005,185	1,864,790	2,294,230	2,153,835	1,766,861	1,626,466
2026	2,038,719	1,898,136	2,323,192	2,182,609	1,796,998	1,656,414
2027	2,070,412	1,929,688	2,350,432	2,209,708	1,825,512	1,684,788
2028	2,100,116	1,959,292	2,376,624	2,235,800	1,852,251	1,711,427
2029	2,127,979	1,987,093	2,402,183	2,261,297	1,877,343	1,736,456
2030	2,154,086	2,013,184	2,426,740	2,285,838	1,900,861	1,759,959
2031	2,178,607	2,037,742	2,449,928	2,309,064	1,922,971	1,782,107
2032	2,202,155	2,061,375	2,472,891	2,332,111	1,944,228	1,803,449
2033	2,225,089	2,084,458	2,494,852	2,354,221	1,964,950	1,824,319
2034	2,247,090	2,106,661	2,515,823	2,375,394	1,984,854	1,844,424
2035	2,267,828	2,127,660	2,536,196	2,396,028	2,003,638	1,863,470

[Figure III-5] **Forecasts on the Number of Medicaid Beneficiaries (40%-MI Households)**

(Unit: number of persons)



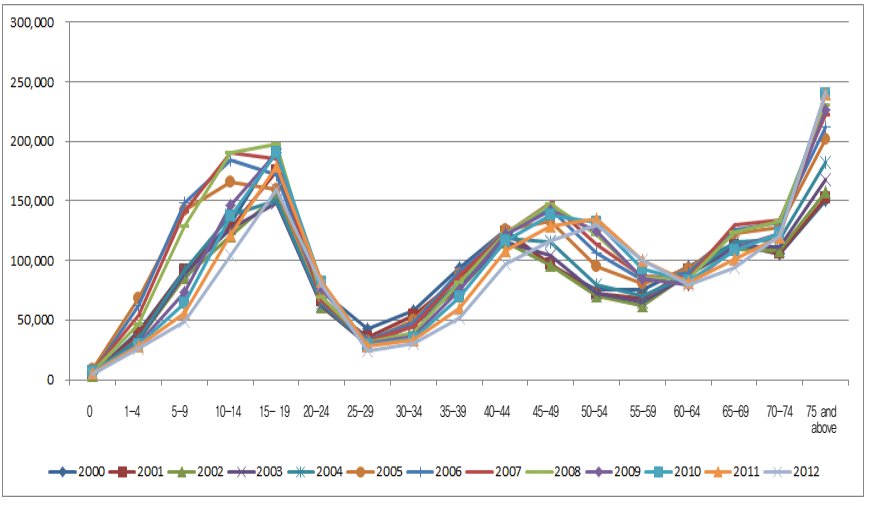
C. Forecasts on the number of Medicaid beneficiaries by age group

From 2000 to 2012, the proportion of the elderly (aged 65 and older) among total Medicaid beneficiaries remained consistently high, while the numbers of young beneficiaries aged 15 to 19 and of beneficiaries in their 40s also remained sizable. In the meantime, children under the age of 10 and individuals in their 20s and 30s form relatively insignificant groups. No radical changes took place in this makeup throughout the 12 years from 2000 to 2012. In recent years, however, the average age of Medicaid beneficiaries has been rising, as indicated by the rightward shift of the graph.

In order to project the age distribution of future Medicaid beneficiaries, this study first estimated the ratio of Medicaid-supported households in each age group, and applied the assumption that the average ratio over the last three years (2009–2012) will remain consistent into the future (i.e., baseline scenario). Assumptions that the average ratios of the last 10 years (2000–2012) and of the last year (2012) will remain consistent into the future also informed the higher and lower scenarios, respectively, that were used in the sensitivity analysis.

[Figure III-6] **Trends in the Age Distribution of Medicaid Beneficiaries (2000-2012)**

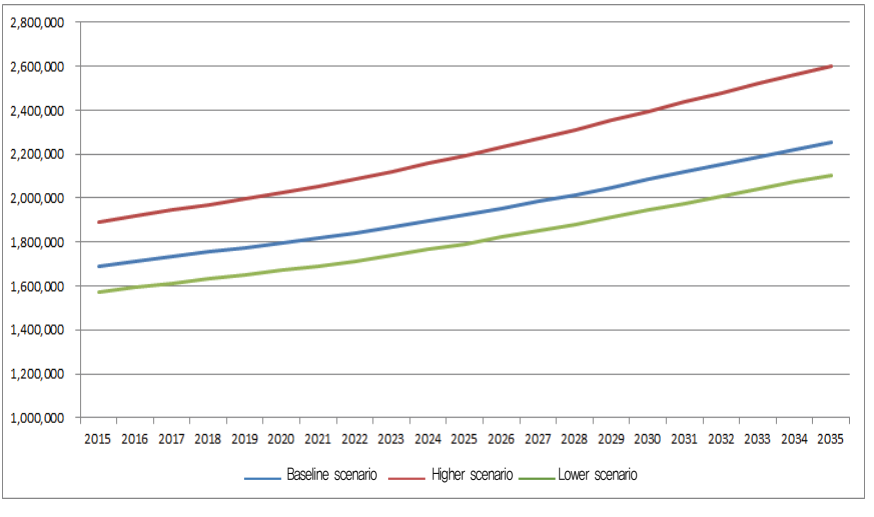
(Unit: number of persons)



Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

[Figure III-7] **Yearly Forecasts on the Number of Beneficiaries in Each Scenario**

(Unit: number of persons)



〈Table III-8〉 **Age Distribution of Medicaid Beneficiaries (2000-2012)**

(Unit: %)

Age	2000	2001	2002	2003	2004	2005	2006
0	0.76	0.83	0.71	0.90	1.10	1.82	1.18
1–4	1.52	1.49	1.33	1.39	1.54	3.25	3.18
5–9	2.61	2.61	2.44	2.59	2.78	4.38	4.75
10–14	4.18	4.00	3.73	3.80	4.04	4.77	5.31
15–19	5.04	4.83	4.53	4.58	4.75	5.08	5.46
20–24	1.94	1.68	1.54	1.55	1.64	1.85	1.90
25–29	0.97	0.84	0.75	0.74	0.78	0.85	0.85
30–34	1.38	1.25	1.08	1.03	1.06	1.15	1.14
35–39	2.21	2.03	1.83	1.88	1.95	2.10	2.10
40–44	3.12	2.98	2.71	2.68	2.75	2.95	2.95
45–49	3.29	3.09	2.86	2.91	3.04	3.35	3.49
50–54	3.19	2.98	2.80	2.83	2.97	3.32	3.44
55–59	3.78	3.41	3.03	3.08	3.19	3.54	3.57
60–64	5.23	4.91	4.68	4.56	4.55	4.80	4.67
65–69	8.28	7.69	7.12	7.01	7.04	7.32	7.21
70–74	11.45	11.02	10.45	10.18	10.07	10.24	10.03
75 and above	13.83	13.30	13.04	13.20	13.43	14.03	13.80

Age	2007	2008	2009	2010	2011	2012
0	1.53	1.39	1.30	1.40	1.17	1.04
1–4	2.90	2.55	1.64	1.60	1.55	1.43
5–9	4.75	4.59	2.74	2.56	2.38	2.15
10–14	5.55	5.67	4.45	4.27	3.92	3.51
15–19	5.73	5.93	5.57	5.50	5.16	4.67
20–24	1.96	2.12	2.36	2.54	2.53	2.37
25–29	0.82	0.79	0.77	0.78	0.77	0.70
30–34	1.11	1.02	0.96	0.90	0.84	0.75
35–39	2.01	1.85	1.72	1.62	1.45	1.28
40–44	2.95	2.96	2.90	2.75	2.52	2.21
45–49	3.52	3.44	3.33	3.25	3.05	2.81
50–54	3.46	3.45	3.36	3.39	3.33	3.10
55–59	3.58	3.44	3.24	3.35	3.32	3.11
60–64	4.38	4.17	3.77	3.75	3.58	3.40
65–69	7.20	6.72	5.96	5.85	5.46	4.99
70–74	9.68	9.21	8.18	7.86	7.36	7.13
75 and above	13.54	13.02	11.92	11.71	10.97	10.31

Note: The table indicates the ratio of Medicaid beneficiaries to the total population of each age group

Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

<Table IV-9> shows the age distribution of Medicaid beneficiaries in each scenario. This study forecasts that the number of Medicaid beneficiaries will rise to 2.3 million, 2.6 million, and 2.1 million, respectively, in the baseline, higher, and lower scenarios. The age-dependent forecasts predict a greater total number of Medicaid beneficiaries than the median-income model, mainly because the age model is more sensitive to the aging of the population and the concentration of the elderly among Medicaid beneficiaries. Given the demographic trends at large, such as the aging of the Korean population, the number of Medicaid beneficiaries will keep increasing.

〈Table III-9〉 **Yearly Forecasts on the Age Distribution of Medicaid Beneficiaries in Each Future Scenario**

(Unit: %)

Age	Baseline scenario	Higher scenario	Lower scenario
0	1.20	1.16	1.04
1–4	1.53	1.95	1.43
5–9	2.36	3.18	2.15
10–14	3.90	4.40	3.51
15–19	5.11	5.14	4.67
20–24	2.48	2.00	2.37
25–29	0.75	0.80	0.70
30–34	0.83	1.05	0.75
35–39	1.45	1.85	1.28
40–44	2.50	2.80	2.21
45–49	3.04	3.19	2.81
50–54	3.27	3.20	3.10
55–59	3.26	3.36	3.11
60–64	3.58	4.34	3.40
65–69	5.43	6.76	4.99
70–74	7.45	9.45	7.13
75 and above	11.00	12.78	10.31

Notes: 1) Baseline scenario: Based on the average age distribution of beneficiaries in the years 2010 through 2012
2) Higher scenario: Based on the average age distribution of beneficiaries in the years 2000 through 2012
3) Lower scenario: Based on the age distribution of beneficiaries in the year 2012

〈Table III-10〉 **Yearly Forecasts on the Age Distribution of Medicaid Beneficiaries in Each Future Scenario**

(Unit: number of persons)

	Baseline scenario	Higher scenario	Lower scenario
2015	1,691,913	1,893,011	1,572,434
2016	1,712,917	1,918,774	1,592,679
2017	1,733,360	1,944,792	1,612,377
2018	1,753,772	1,971,277	1,632,017
2019	1,773,692	1,997,735	1,651,156
2020	1,793,662	2,024,766	1,670,206
2021	1,815,533	2,053,877	1,690,879
2022	1,840,539	2,086,617	1,714,335
2023	1,867,394	2,121,280	1,739,493
2024	1,894,749	2,156,876	1,765,219
2025	1,923,663	2,194,615	1,792,467
2026	1,954,002	2,233,765	1,821,107
2027	1,985,130	2,273,294	1,850,580
2028	2,016,193	2,312,449	1,880,081
2029	2,049,054	2,353,538	1,911,219
2030	2,083,929	2,396,300	1,944,247
2031	2,118,262	2,437,904	1,976,831
2032	2,152,828	2,479,481	2,009,544
2033	2,186,157	2,519,509	2,040,946
2034	2,219,676	2,559,192	2,072,410
2035	2,252,703	2,597,841	2,103,354

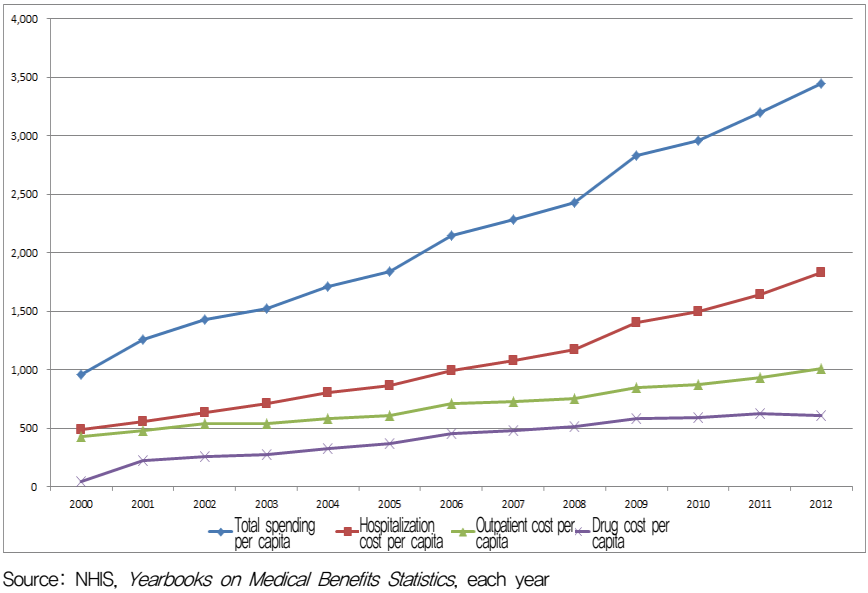
3 Model for forecasting Medicaid spending per capita

A. Forecasts on Medicaid spending per capita

Forecasts on Medicaid spending per capita are based on past time series trends. This study uses data on monthly Medicaid spending of the last 12 years from 2000 to 2012 to produce forecasts on different types of spending, i.e., hospitalization costs, outpatient costs, and drug costs. The time series data on Medicaid spending per capita show clear patterns and trends, but forecasting would be more effective if these patterns and trends were removed by dividing the spending data into different types of medical services and benefits provided.

[Figure III-8] **Yearly Trends in Medical Spending per Capita (2000-2012)**

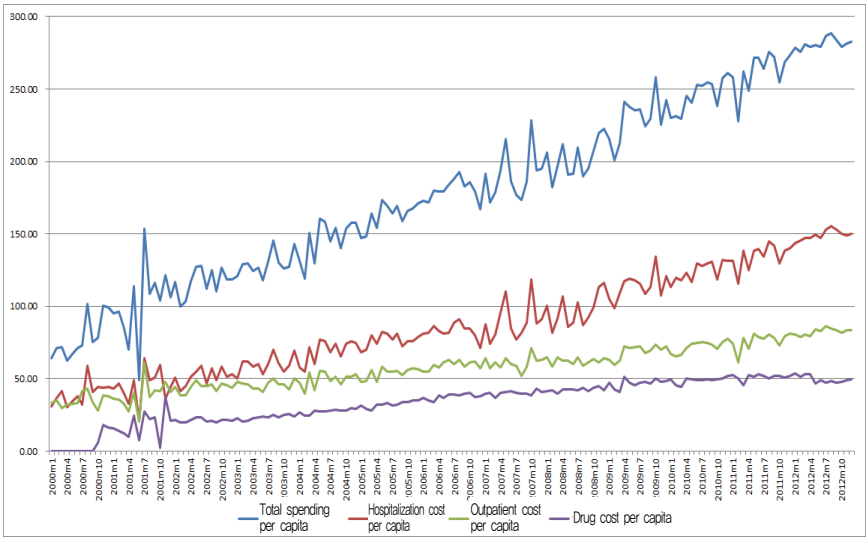
(Unit: KRW 1,000 per capita)



Source: NHIS, *Yearbooks on Medical Benefits Statistics*, each year

[Figure III-9] **Monthly Trends in Medicaid Spending per Capita (January 2000–December 2012)**

(Unit: KRW 1,000 per capita)



Source: NHIS, *Yearbooks on Medical Benefits Statistics, each year*

The existing literature on the time-series model for forecasting Medicaid spending also includes, for the most part, the consumer price index (CPI) as an explanatory variable, and uses the ARMA process model that includes monthly dummy variables (Shin, 2006; Roh et al., 2008; Choi, 2008). Seasonal trends were eliminated by adding monthly dummy variables to the following formula for the ARMA (1,1) process:

$$y_t = \sum_{i=1}^{12} \alpha_i d_{i.t} + \beta x_t + \epsilon_t$$

$$\epsilon_t - \gamma\theta_{t-1} + \rho\nu_{t-1} + \nu_t$$

Where y_t stands for spending per capita; $d_{i,t}$, for monthly dummy variables; and x_t, the CPI. The augmented Dickey-Fuller unit root test led to the rejection of the null hypothesis that, with time trends considered, the

hospitalization, outpatient, drug, and total Medicaid costs per capita carry unit roots. <Table IV-20> summarizes the outcomes of the time-series model for forecasting hospitalization, outpatient, and drug costs per capita. Monthly forecasts on these costs per capita, based on these estimates, are summarized in <Table IV-21>. Monthly cost forecasts were added up to yield yearly costs per capita.

〈Table III-11〉 **Time-Series Model Forecasts on Medicaid Costs per Capita**

Independent variable	Hospitalization	Outpatient	Drug	Total
January	−204.078*** (15.576)	−64.248*** (5.229)	−93.514*** (30.306)	−350.646*** (13.42)
February	−208.284*** (15.427)	−68.287*** (5.342)	−95.851*** (30.676)	−361.177*** (14.061)
March	−203.488*** (15.304)	−65.046*** (5.033)	−97.701*** (31.168)	−354.936*** (13.875)
April	−204.623*** (15.388)	−67.057*** (5.079)	−94.691*** (31.052)	−355.047*** (13.26)
May	−200.694*** (15.258)	−61.904*** (5.007)	−94.527*** (31.077)	−345.786*** (13.268)
June	−204.006*** (15.041)	−64.777*** (4.89)	−95.440*** (30.869)	−352.882*** (12.828)
July	−202.501*** (15.472)	−60.992*** (4.898)	−94.829*** (31.04)	−346.961*** (12.934)
August	−200.606*** (15.04)	−63.697*** (5.07)	−95.478*** (30.914)	−348.392*** (13.853)
September	−205.261*** (15.745)	−65.763*** (5.502)	−96.187*** (30.815)	−355.799*** (14.173)
October	−200.418*** (15.508)	−64.105*** (5.035)	−96.425*** (30.674)	−349.556*** (13.919)
November	−203.745*** (15.224)	−62.937*** (5.054)	−92.086*** (30.707)	−347.415*** (13.913)
December	−201.692*** (15.097)	−62.820*** (5.912)	−94.078*** (30.614)	−347.241*** (14.276)
CPI	326.519*** (17.336)	136.894*** (5.623)	139.653*** (37.745)	595.096*** (14.892)
AR(1)	0.942*** (0.108)	0.842*** (0.219)	0.985*** (0.022)	0.820** (0.338)
MA(1)	−0.876*** (0.134)	−0.763*** (0.253)	−0.687*** (0.056)	−0.760** (0.377)

Note: The asterisks, *, **, ***, signify statistical significance levels of 10 percent, 5 percent, and 1 percent, respectively

〈Table III-12〉 **Forecasts on Medicaid Costs per Capita by Year and Type**

(Unit: KRW 1,000 per capita)

Year	Total per capita	Hospitalization	Outpatient	Drug
2015	3,885.8	2,010.4	1,092.1	719.2
2016	4,128.9	2,141.4	1,148.0	782.9
2017	4,379.3	2,277.7	1,205.5	847.2
2018	4,652.5	2,427.0	1,268.4	916.0
2019	4,939.1	2,584.0	1,334.3	987.2
2020	5,231.4	2,744.2	1,401.6	1,059.1
2021	5,525.2	2,905.4	1,469.1	1,130.8
2022	5,816.2	3,065.0	1,536.1	1,201.4
2023	6,105.3	3,223.6	1,602.6	1,271.2
2024	6,394.3	3,382.2	1,669.0	1,340.6
2025	6,684.5	3,541.4	1,735.8	1,410.1
2026	6,975.6	3,701.1	1,802.8	1,479.5
2027	7,268.6	3,861.9	1,870.2	1,549.3
2028	7,561.7	4,022.7	1,937.6	1,618.9
2029	7,855.7	4,184.0	2,005.2	1,688.5
2030	8,149.7	4,345.3	2,072.8	1,758.1
2031	8,443.1	4,506.3	2,140.3	1,827.4
2032	8,734.6	4,666.2	2,207.4	1,896.2
2033	9,025.8	4,826.0	2,274.4	1,964.9
2034	9,318.2	4,986.4	2,341.6	2,033.8
2035	9,609.8	5,146.5	2,408.7	2,102.5

Note: "a," "b," "c," and "d" stand for the yearly Medicaid cost per capita, estimated using ARMA (1,1).

B. Forecasts on Medicaid costs per capita for each age group

In forecasting Medicaid costs per capita for each age group, the underlying assumption was that the makeup of Medicaid costs would remain consistent in each age group, so that the Medicaid costs per capita of each group would maintain the same ratio to Medicaid costs per capita on the whole. <Table IV-23> shows the average makeup of different types of Medicaid costs per capita for each age group over the past 10 years. The average weight of each age group was applied to estimates on overall Medicaid costs per capita. <Table IV-24> and <IV-27> show projections for the hospitalization, outpatient, and drug costs per capita for each age group.

〈Table III-13〉 **Average Ratios of Medical Costs per Capita for Each Age Group**

(Unit: %)

Age	Hospitalization	Outpatient	Drug	Total
0	53.7	87.4	26.6	18.6
1–4	45.4	35.9	56.2	51.5
5–9	25.4	14.8	39.6	28.4
10–14	17.6	10.7	28.5	16.7
15–19	18.6	13.7	27.6	15.9
20–24	32.0	30.3	41.1	21.5
25–29	79.4	86.5	91.8	38.5
30–34	102.2	112.5	118.0	47.6
35–39	103.0	113.2	115.8	55.0
40–44	111.2	123.0	118.4	69.2
45–49	132.5	146.7	134.4	93.8
50–54	153.2	167.2	149.3	124.1
55–59	158.8	163.7	154.9	152.2
60–64	150.8	140.4	151.8	175.8
65–69	143.6	123.5	144.6	195.0
70–74	152.2	136.7	142.8	210.3
75 and above	145.6	152.8	114.3	181.1

〈Table III-14〉 **Forecasts on Total Medical Costs per Capita for Each Age Group**

(Unit: KRW 1,000 per capita)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
0	2,085	2,216	2,350	2,496	2,650	2,807	2,965	3,121	3,276	3,431	3,587
1–4	1,764	1,874	1,988	2,112	2,242	2,375	2,508	2,640	2,772	2,903	3,035
5–9	988	1,050	1,114	1,183	1,256	1,330	1,405	1,479	1,553	1,626	1,700
10–14	683	725	769	817	868	919	971	1,022	1,072	1,123	1,174
15–19	724	770	816	867	921	975	1,030	1,084	1,138	1,192	1,246
20–24	1,245	1,323	1,403	1,491	1,582	1,676	1,770	1,863	1,956	2,049	2,142
25–29	3,085	3,277	3,476	3,693	3,921	4,153	4,386	4,617	4,846	5,076	5,306
30–34	3,970	4,219	4,474	4,754	5,046	5,345	5,645	5,943	6,238	6,533	6,830
35–39	4,003	4,253	4,511	4,793	5,088	5,389	5,692	5,992	6,289	6,587	6,886
40–44	4,323	4,593	4,872	5,176	5,495	5,820	6,147	6,471	6,792	7,114	7,436
45–49	5,149	5,472	5,803	6,165	6,545	6,933	7,322	7,708	8,091	8,474	8,858
50–54	5,952	6,324	6,707	7,126	7,565	8,012	8,462	8,908	9,351	9,794	10,238
55–59	6,170	6,556	6,953	7,387	7,842	8,307	8,773	9,235	9,694	10,153	10,614
60–64	5,861	6,227	6,605	7,017	7,449	7,890	8,333	8,772	9,208	9,644	10,081
65–69	5,581	5,930	6,290	6,682	7,094	7,514	7,936	8,354	8,769	9,184	9,601
70–74	5,916	6,286	6,667	7,083	7,519	7,964	8,412	8,855	9,295	9,735	10,177
75 and above	5,659	6,013	6,378	6,776	7,193	7,619	8,047	8,471	8,891	9,312	9,735

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
0	3,743	3,900	4,058	4,215	4,373	4,530	4,687	4,843	5,000	5,157
1–4	3,167	3,300	3,433	3,566	3,700	3,833	3,965	4,098	4,230	4,363
5–9	1,774	1,849	1,923	1,998	2,073	2,147	2,221	2,295	2,370	2,444
10–14	1,225	1,277	1,328	1,380	1,432	1,483	1,534	1,586	1,637	1,688
15–19	1,300	1,355	1,409	1,464	1,519	1,574	1,628	1,682	1,737	1,791
20–24	2,235	2,329	2,423	2,517	2,611	2,705	2,798	2,892	2,985	3,079
25–29	5,537	5,770	6,002	6,236	6,469	6,702	6,933	7,165	7,397	7,628
30–34	7,127	7,427	7,726	8,027	8,327	8,627	8,925	9,222	9,521	9,819
35–39	7,186	7,488	7,790	8,093	8,395	8,698	8,998	9,298	9,599	9,900
40–44	7,760	8,086	8,412	8,739	9,067	9,393	9,717	10,041	10,366	10,691
45–49	9,244	9,632	10,021	10,410	10,800	11,189	11,575	11,961	12,348	12,735
50–54	10,684	11,133	11,582	12,032	12,482	12,932	13,378	13,824	14,272	14,719
55–59	11,076	11,541	12,007	12,473	12,940	13,406	13,869	14,331	14,796	15,259
60–64	10,520	10,962	11,404	11,848	12,291	12,734	13,173	13,612	14,053	14,493
65–69	10,019	10,440	10,861	11,283	11,706	12,127	12,546	12,964	13,384	13,803
70–74	10,620	11,066	11,512	11,960	12,407	12,854	13,298	13,741	14,186	14,630
75 and above	10,159	10,586	11,012	11,441	11,869	12,296	12,721	13,145	13,571	13,995

Note: Forecasts on total Medicaid cost per capita for each year (irrespective of age group) were multiplied by the ratio of total Medicaid cost per capita for each age group to the total Medicaid cost per capita

4 Forecasts on Medicaid spending

This study forecasts changes in Medicaid spending for both scenarios: (a) where the current MCL standard is kept intact; and (b) where the current MCL standard is replaced by the 40 percent or less of median income standard. This study found that the adoption of the latter standard would lead to a significant and dramatic increase in Medicaid spending, as the standard would raise the number of eligible beneficiaries.

A. MCL model

Forecasts on total Medicaid spending were obtained by multiplying forecasts on the number of beneficiaries by forecasts on spending per capita. <Table IV-16> indicates the forecasts from the baseline scenario, while <Table IV-17> lists the outcomes of sensitivity analyses of each scenario. The baseline scenario shows that total Medicaid spending would increase from KRW 5.8 trillion (0.4 percent of GDP) in 2015 to KRW 19.5 trillion by 2035 (or 0.52 percent of GDP). The higher scenario forecasts that total spending would rise to KRW 22.7 trillion (0.61 percent of GDP), while the lower scenario forecasts KRW 18.2 trillion (0.48 percent of GDP) by 2035, respectively. The pace of increase in Medicaid spending, and in its proportion to GDP, is expected to slow down a bit beginning in 2029, but will continue to rise steadily until 2035 or so.

〈Table III-15〉 **Medicaid Spending Forecasts for Each Scenario (MCL Model)**

(Unit: KRW 1,000)

Year	Baseline scenario	Higher scenario	Lower scenario
2015	5,839,558,348	7,095,288,949	5,414,804,835
2016	6,349,196,724	7,698,341,681	5,888,396,354
2017	6,883,955,776	8,330,734,834	6,385,489,059
2018	7,469,698,172	9,022,484,861	6,930,044,384
2019	8,091,822,491	9,754,508,201	7,508,502,813
2020	8,738,048,911	10,513,501,865	8,109,494,769
2021	9,401,212,956	11,291,321,380	8,726,398,313
2022	10,073,357,987	12,079,166,136	9,351,796,109
2023	10,753,426,995	12,869,717,377	9,984,635,076

〈Table III-15〉 **Continued**

Year	Baseline scenario	Higher scenario	Lower scenario
2024	11,446,579,715	13,665,560,727	10,629,728,157
2025	12,155,425,714	14,468,733,975	11,289,455,742
2026	12,879,170,009	15,277,230,754	11,963,067,911
2027	13,610,869,327	16,092,350,776	12,644,135,274
2028	14,345,527,897	16,913,242,339	13,327,886,421
2029	15,084,242,531	17,743,583,470	14,015,344,821
2030	15,824,378,841	18,578,166,582	14,704,115,924
2031	16,563,911,968	19,412,102,722	15,392,479,127
2032	17,303,614,845	20,248,309,209	16,081,202,739
2033	18,048,590,426	21,084,867,068	16,775,039,188
2034	18,798,772,377	21,924,259,535	17,473,947,862
2035	19,547,002,578	22,763,329,097	18,171,237,802

〈Table III-16〉 **Medicaid Spending-to-GDP Ratio Forecasts for Each Scenario (MCL Model)**

Year	Baseline scenario	Higher scenario	Lower scenario
2015	0.40%	0.49%	0.37%
2016	0.41%	0.50%	0.38%
2017	0.42%	0.51%	0.39%
2018	0.43%	0.52%	0.40%
2019	0.44%	0.53%	0.41%
2020	0.45%	0.54%	0.42%
2021	0.46%	0.55%	0.43%
2022	0.47%	0.56%	0.43%
2023	0.47%	0.57%	0.44%
2024	0.48%	0.57%	0.45%
2025	0.49%	0.58%	0.45%
2026	0.49%	0.58%	0.46%
2027	0.50%	0.59%	0.46%
2028	0.50%	0.59%	0.47%
2029	0.51%	0.60%	0.47%
2030	0.51%	0.60%	0.47%
2031	0.51%	0.60%	0.48%
2032	0.52%	0.60%	0.48%
2033	0.52%	0.60%	0.48%
2034	0.52%	0.61%	0.48%
2035	0.52%	0.61%	0.48%

Note: Medicaid spending–to–GDP ratios are based on forecasted costs for hospitalization, outpatient visits, and drugs

B. Median income (MI) model

The same forecasting procedure used in the MCL model was applied in the MI model as well. As the MI standard (benefitting households earning up to 40 percent of the median income) will increase the number of Medicaid beneficiaries over the MCL model, the MI model produces forecasts slightly higher than those of the MCL model. <Table IV-32> and <IV-33> forecast that Medicaid spending will rise to KRW 21.9 trillion, or 0.58 percent of GDP in the baseline scenario, by 2035, which is about 0.06 percentage points higher than the MCL forecast. As <Table IV-44> shows, the higher scenario predicts that spending will rise to KRW 24.5 trillion (0.65 percent of GDP), while the lower scenario forecasts KRW 19.4 trillion (0.52 percent of GDP). As with the MCL model, the MI model also forecasts that Medicaid spending and its proportion to GDP will consistently rise until 2035, but at a slower pace than the MCL model predicts.

〈Table III-17〉 **Medicaid Spending Forecasts for Each Scenario (MI Model)**

(Unit: KRW 1,000)

Year	Baseline scenario	Higher scenario	Lower scenario
2015	6,251,891,656	7,344,189,936	5,485,989,192
2016	6,823,221,604	7,993,661,151	5,990,033,658
2017	7,424,659,707	8,676,524,051	6,521,008,460
2018	8,084,066,040	9,424,074,340	7,103,340,511
2019	8,785,717,214	10,215,933,813	7,723,213,977
2020	9,516,397,844	11,038,125,836	8,369,050,870
2021	10,268,456,455	11,882,196,588	9,034,187,470
2022	11,033,059,980	12,738,760,648	9,710,842,744
2023	11,808,233,892	13,599,761,372	10,397,178,623
2024	12,599,298,270	14,466,903,000	11,097,910,271
2025	13,409,277,158	15,342,209,326	11,815,530,128
2026	14,237,232,549	16,223,826,406	12,549,189,193
2027	15,075,262,032	17,114,170,201	13,292,076,782
2028	15,917,062,863	18,012,755,091	14,038,462,387
2029	16,763,703,903	18,923,813,223	14,789,248,186
2030	17,612,410,576	19,841,704,271	15,541,968,139

〈Table III-17〉 **Continued**

Year	Baseline scenario	Higher scenario	Lower scenario
2031	18,461,607,511	20,760,797,669	16,295,343,042
2032	19,312,474,007	21,686,776,802	17,050,507,314
2033	20,170,987,733	22,616,459,338	17,812,762,550
2034	21,036,924,393	23,552,763,087	18,581,906,409
2035	21,901,908,663	24,493,710,799	19,350,448,343

Note: Based on forecasted costs for hospitalization, outpatient visits, and drugs

〈Table III-18〉 **Medicaid Spending-to-GDP Ratio Forecasts for Each Scenario (MI Model)**

Year	Baseline scenario	Higher scenario	Lower scenario
2015	0.43%	0.51%	0.38%
2016	0.44%	0.52%	0.39%
2017	0.46%	0.53%	0.40%
2018	0.47%	0.54%	0.41%
2019	0.48%	0.56%	0.42%
2020	0.49%	0.57%	0.43%
2021	0.50%	0.58%	0.44%
2022	0.51%	0.59%	0.45%
2023	0.52%	0.60%	0.46%
2024	0.53%	0.61%	0.47%
2025	0.54%	0.62%	0.47%
2026	0.55%	0.62%	0.48%
2027	0.55%	0.63%	0.49%
2028	0.56%	0.63%	0.49%
2029	0.56%	0.64%	0.50%
2030	0.57%	0.64%	0.50%
2031	0.57%	0.64%	0.50%
2032	0.58%	0.65%	0.51%
2033	0.58%	0.65%	0.51%
2034	0.58%	0.65%	0.51%
2035	0.58%	0.65%	0.52%

Note: Medicaid spending–to–GDP ratios are based on forecasted costs for hospitalization, outpatient visits, and drugs

C. Age group model

This study also made forecasts on Medicaid spending by age group based on the MI-model forecasts. <Table IV-46> and <IV-48> show the distributions of hospitalization, outpatient visits, and drug costs among age groups under the MI model in the baseline scenario. <Table IV-49> lists forecasts on Medicaid spending by hospitalization, outpatient visits, and drug costs. <Tables IV-50> and <IV-51> show Medicaid spending forecasts for different scenarios. <Table IV-52> summarizes Medicaid spending forecasts for different scenarios.

〈Table III-19〉 **Medicaid Spending Forecasts for Each Scenario (Age Group Model)**

(Unit: KRW 100 million)

Year	Baseline scenario	Higher scenario	Lower scenario
2015	72,609	82,385	67,849
2016	79,031	89,745	73,871
2017	85,817	97,558	80,238
2018	93,258	106,156	87,222
2019	101,180	115,350	94,656
2020	109,462	125,002	102,420
2021	118,076	135,066	110,490
2022	126,968	145,479	118,815
2023	136,120	156,219	127,384
2024	145,616	167,404	136,285
2025	155,492	179,089	145,551
2026	165,733	191,233	155,166
2027	176,335	203,809	165,126
2028	187,235	216,751	175,372
2029	198,555	230,189	186,016
2030	210,333	244,131	197,093
2031	222,441	258,421	208,482
2032	234,783	272,955	220,086
2033	247,294	287,664	231,832
2034	260,076	302,654	243,813
2035	273,054	317,823	255,969

Note: Based on forecasted costs for hospitalization, outpatient visits, and drugs for each age group

The age group model forecasts that total Medicaid spending will rise to KRW 27.3 trillion, or 0.73 percent of GDP, by 2035, which is KRW 5.4 trillion or 0.15 percentage points higher than predicted by the MI model. More specifically, the higher scenario forecasts that spending will increase even higher to KRW 31.8 trillion or 0.85 percent of GDP by 2035, while the lower scenario predicts that spending will rise to KRW 25.6 trillion or 0.68 percent of GDP. The age group model projects that the ratio of Medicaid spending to GDP will continue to expand consistently until 2035 without slowing down. This is because the continued aging of the Korean population will only increase the amount of medical spending on the elderly.

〈Table III-20〉 **Medicaid Spending-to-GDP Ratio Forecasts for Each Scenario (Age Group Model)**

(Unit: %)

Year	Baseline scenario	Higher scenario	Lower scenario
2015	0.50	0.57	0.47
2016	0.51	0.58	0.48
2017	0.53	0.60	0.49
2018	0.54	0.61	0.50
2019	0.55	0.63	0.52
2020	0.56	0.64	0.53
2021	0.58	0.66	0.54
2022	0.59	0.67	0.55
2023	0.60	0.69	0.56
2024	0.61	0.70	0.57
2025	0.62	0.72	0.58
2026	0.63	0.73	0.59
2027	0.65	0.75	0.60
2028	0.66	0.76	0.61
2029	0.67	0.77	0.62
2030	0.68	0.79	0.64
2031	0.69	0.80	0.65
2032	0.70	0.81	0.66
2033	0.71	0.83	0.67
2034	0.72	0.84	0.67
2035	0.73	0.85	0.68

Note: Medicaid spending-to-GDP ratios are based on forecasted costs of hospitalization, outpatient visits, and drugs

Ⅳ

Conclusion

This study predicts that the current trend of increase in Medicaid spending in Korea will continue well into the next two decades and beyond due to the aging population and the accompanying rise in the amount of medical expenses for the elderly. The results of analyses of different types of medical spending by age group formed the basis of our forecast that Medicaid spending will likely increase from 0.68 to 0.85 percent of GDP by 2035. Medicaid spending may be insignificant in comparison to spending incurred in major social security programs, such as NHI and the National Pension. Nevertheless, the unstoppable increase in the amount of Medicaid spending over the last decade or so and the prevalent moral hazards of excessive hospitalization and drug overuse among Medicaid beneficiaries strongly point to the need to improve the effectiveness and efficiency of Medicaid benefits. As the Korean government continues to expand public medical benefits and even convert items of non-paid benefits into paid benefits, we must guarantee the sustainability of Korea's fiscal policy by ensuring maximum efficiency in all accounts and items of public spending, including Medicaid.

The causes behind the increases in the amounts of Medicaid benefits and spending are indeed complex and layered, and cannot be solved with a few simple solutions overnight. As for the demand side, scholars have argued that the excessive demand for Medicaid benefits and services ought to be reined in by imposing greater amounts of out-of-pocket expenses on Medicaid beneficiaries (Shin, 2011; Yun, 2011; and Kim, 2013). These scholars agree that the current level of out-of-pocket payments required from Medicaid beneficiaries is too low,

and that such payments should be required from even Class-1 beneficiaries. Numerous member states of the Organization for Economic Cooperation and Development (OECD) impose out-of-pocket payment requirements on patients in order to prevent excessive and long-term hospitalization.

The absence of the out-of-pocket payment requirement is indeed the main culprit for the continued rise in Medicaid spending, clear evidence of which is found in the excessive hospitalizations and prescribed medications among Class-1 beneficiaries. The fact that a significant portion of Medicaid beneficiaries are remain in hospitalization or outpatient services and treatments for over one year speaks to the gross inefficiency of the medical care system under Medicaid in Korea today. As hospitals and medical practitioners themselves also induce and fuel excessive demand on the part of Medicaid beneficiaries, it is time that the Korean government start to do something about the situation, especially by introducing and reinforcing the out-of-pocket payment requirement.

How much patients pay for the medical care they receive ultimately affects the price of medical care. The literature on the impact of out-of-pocket payments on the frequency with which patients seek medical care assumes the price elasticity of demand for outpatient treatments and drugs. For example, based on data from 1974 to 1977, Manning et al. (1987) argued that the price elasticity of outpatient services and treatments was -0.17 when patients were required to pay zero to 25 percent of the cost, and that the price elasticity dropped to -0.22 when the out-of-pocket ratio was increased to 25 to 95 percent of the cost. The price elasticity of prescription medications, on the other hand, tends to be lower than is the case with medical services and treatments. Gibson et al. (2005) proposed -0.041 as the price elasticity of demand for prescribed medications if the out-of-pocket payment requirement were to be introduced. Choi (2010) estimated the price elasticity of demand for Class-1 outpatient medical services and treatments as -0.012 under the out-of-pocket payment requirement, which is considerably inelastic. Koh et al. (2002) sought to measure the price elasticity of demand for different types of outpatient services, and concluded that the price elasticity of the demand was the highest, i.e., -0.206, with respect to herbal and traditional medicine, while it reached only -0.194 to -0.179 for hospital and clinic services, -0.126 for community health center services, and -0.087 to -0.073 for general hospital services.

In general, the price elasticity of demand for medical services would be almost nonexistent with respect to patients of severe diseases. While evidence on the matter is inconclusive, some studies have shown that low-income patients show greater price elasticity than their higher-income counterparts with respect to outpatient services. Some studies do show greater price elasticity in demand for medical care. Choi (1988), for instance, proposed -1.13 for general hospital services, while Feldstein (1971) proposed -1.12.

Some of the studies mentioned so far do exhibit some problems in terms of research methodology and controlling for other possible factors. With these studies, one cannot simply conclude that raising and reinforcing the out-of-pocket payment requirement will reduce the demand for medical care dramatically, especially for low-income patients with severe or rare diseases who require hospitalization or outpatient services and treatments. Given the fact that Medicaid principally benefits low-income households, there is also a clear limit on the extent to which the Korean government can raise out-of-pocket payment levels. Nevertheless, we cannot disregard the importance of rational increases to out-of-pocket payment levels to the task of enhancing the efficiency of Medicaid. As Yun (2011) points out, the overall structure of medical service costs and the supply side should be reformed and improved along with readjustment of the Medicaid management system. However, we should also implement some solutions on the demand side.

Another important solution we may adopt in the interest of the long-term sustainability of Medicaid is to enforce more rigorous control against the long-term (past-due) hospitalization of low-income patients who may be treated better or as effectively with outpatient or recovery services. (This does not apply to patients who carry diseases that inevitably require long-term hospitalization.) Moreover, we need to find measures to increase the effectiveness of the current select-medical-institution rule. We need more systematic monitoring and supervision against the corrupt practices of medical institutions, such as wrongful filing of medical expense claims, and we must also reinforce the total medical cost management system and other such devices of control. On the whole, we need to enhance the rigor of the medical benefit evaluation system and of case management, while also reinforcing oversight of medical institutions and suppliers.

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