

Executive Summary

The purpose of this study is to evaluate how the enforcement of the policy to enhance the health insurance coverage of cancer patients (reduction of legal patient share of payment from 20% to 10% from September 2005 and the reduction of patient share of outpatient treatment from 10% to 5% from July 2009) has improved the medical service patterns and patient outcomes of the patients and inequity in medical and health service usage. The study was also aimed to understand the achievements of the policy in order to provide the basis for future policies.

☐ Part I : **Evaluation of the change in medical services before and after the enhancement of health insurance coverage of cancer**

Methods of Part I

In Part I, we used data regarding lung cancer of seven years from the National Health Insurance Corporation (ICD-10: C33/C34, from February 2004 to December 2010) and data regarding cancer patients of up to 10 years from six general hospitals (from 2001 to December 2010) to analyze the changes in medical service usage patterns, cost for diagnosis and treatment patterns of cancer patients, and the prescription of chemotherapy after the enhancement of the health insurance coverage for cancer. We also analyzed how the changes actually impacted the cancer treatment results, that is, the survival of the patients and the quality of treatment.

Results of Part I

1) Treatment and cost patterns

An annual examination of progress in the treatment of patients extracted based on the first use of medical treatment showed that the usage of most treatment methods increased. In addition, lung cancer patients were divided into those 1) with only curative surgery, 2) with only palliative chemotherapy, and 3) both surgery and adjuvant chemotherapy, to analyze the changes in the number of patients. The group with only chemotherapy was the largest at 61.2-67.4%. The increase in the number of patients with only surgery is forecasted to have been caused by the early detection of lung cancer and the increase in the ratio of patients with adjuvant chemotherapy after surgery is deemed to have been caused by the introduction of adjuvant chemotherapy in 2004 and its gradual rise in efficiency. In addition, the patient group with adjuvant chemotherapy after surgery spent more money than the surgery group with the greatest number of patients after 2006.

An analysis of the total treatment cost by item of lung cancer patients showed that most items had an increasing trend. Of them, the increasing range of lung physical therapy and mental therapy was the largest; but it only accounted for less than 1% of total cost. The average treatment cost per patient for the first six months after the first treatment (the sum of the share of insurer payment and patient share payment) steadily increased. The average cost of treatment per patient was KRW 15.29 million and the average patient share paid was KRW 1.02 million in 2010.

2) Trends of the chemotherapy group

Patients with only chemotherapy treatment were divided into the low cost group one and high cost group two to analyze the cost. The chemotherapy group accounted for 94% in 2004 and 96% in 2010 of the absolute amount paid. In addition, group two was divided into targeted chemotherapy and intravenous chemotherapy. Targeted chemotherapy, which accounted for only

2.85% at KRW 304,920,386 in 2004, increased to 15.45% in 2006 after the enhancement of the health insurance coverage and continued to increase annually reaching 21.85% in 2010. The cost per person for targeted chemotherapy continued to increase until 2009 at KRW 1,890,555 and then dropped a little in 2010 to KRW 1,872,098. On the other hand, the cost per person for intravenous chemotherapy continued to increase until 2008 at KRW 7,141,439. It then started to drop to KRW 7,093,040 in 2009 and KRW 6,695,467 in 2010.

3) Medical treatment usage patterns of the deceased

As of the date of death, the cost at one, two, and three months before death was calculated. For each item, the cost of injection was the highest followed by charges for hospital accommodation for the two and three months before death. The cost of radiographic diagnosis and radiotherapy was followed by charges for hospital accommodation and treatment cost at one month before death. However, the cost of lung physical therapy and mental therapy to care for terminal cancer patients was the lowest and was minimal.

Of all deceased patients, examination of the usage trends of intensive care, medication, handling, surgery, and radiotherapy during one, two, and three months before death showed that handling and treatment accounted for 86.9% during one month before death in 2005. But it rose to 92.4% in 2010 with its ratio visibly increased even at one month before death. However, while the ratio of terminal lung cancer patients prescribed with physical and psychologic therapy increased annually, still 90% of patients were not prescribed with them and their usage rate dropped as time progressed from three, two, and to one month before death.

Among active diagnosis of terminal lung cancer patients, CT/MRI/PET scans increased from 28%, 6%, and 1%, respectively, in 2005 to 36%, 10%, and 5%, respectively, in 2010, even at one month before death. The share of MRI/PET scans steadily increased from 2005 to 2010.

The cost of chemotherapy per deceased person for each year was calculated

by dividing the total cost of chemotherapy by the number of deceased patients. The increasing rate year-on-year was analyzed. The total cost of chemotherapy dropped 5% in 2006 year-on-year after the first enhancement of the health insurance coverage for cancer patients in 2005. The decreasing range was 10% for group one patients with chemotherapy, which was higher than group two. The total cost of chemotherapy in 2010 dropped year-on-year after the second enhancement of the health insurance coverage in 2009 and the decreasing rate of group two was higher at 9% than group one at 6%.

4) Survival

The survival rate of all patients diagnosed with lung cancer steadily increased from 2006 to 2010. In particular, women had a higher survival rate than men under 65.

Of the patient group with only a surgery, the survival rate of one year increased annually by over 5% from 66.46% in 2006 to 83.06% in 2010. But the improvement of this group's survival rate is deemed to have been impacted by the early detection of lung cancer, the development of surgical skills, and higher efficiency of lung cancer surgeries.

The survival rate of patients with only chemotherapy increased from 44.61% in 2006 to 51.47% in 2010. In particular, the increasing rate of survival of women with chemotherapy treatment was larger than men. This is most likely because women's lung cancers are more of adenocarcinoma tissue than men, have better prognosis, and have a wider range of chemotherapy choice. An analysis by age of this group showed that the survival rate of one year of those over 75 increased by 5.92% from 32.72% to 38.64% between the same years, which was relatively smaller than the increasing rate of those under 65 at 7.6%. This probably means that the age group with active movement performance capable of overcoming chemotherapy backed the treatment and contributed to the rising survival rate.

The group that got targeted chemotherapy of high cost had a higher survival rate of one year at 63.70% than those who did not at 42.93%. However, this trend turned around after three years and the survival rate of

five years was lower among patients with targeted chemotherapy at 6.08% than those with injection chemotherapy at 11.13%. A multivariable Cox analysis by regression showed that gender, age, cost, radiotherapy, mental therapy, nursing and care, narcotic analgesics, number of CTs, number of MRIs, and number of PETs independently had a meaningful impact on the prognosis of the total survival rate.

5) Quality of treatment

The average time of waiting from the first day of recuperation to the first surgery of patients who got surgery for the purpose of full recovery drastically dropped from 51.9 days in 2004 to 14.2 days in 2010. An analysis of the survival rate during the waiting period showed that the delay in surgery meaningfully exacerbated the treatment results among women. In addition, the death rate within 30 days of surgery was largely higher among those whose waiting period was over 31 days.

6) Trends of patient share payment with the enhancement of the health insurance coverage

An analysis for out-of-pocket Health Care Expenditure by year from 2001 to 2010 in six general hospitals showed that it drastically dropped with the implementation of the policy to reduce the patient share for insured items from 2005 to 2006. It maintained 10% until 2010, when it dropped to below 10%. The patient share of uninsured items also steadily dropped until 2008 most likely because of the policy change of converting non-insured items into insured. But it started to increase again by 2008. This is deemed to have been caused by the continuous transfer of high-cost new medical technology into non-insured items. Although the average medical cost paid by each patient dropped from the policy change on the total patient share except for the corporation's share, the total patient share remained at 30% as of 2010.

An analysis of the average payment made by each cancer patient per item showed that the cost of testing including radiographic diagnosis steadily increased and accounted for the largest share of total medical cost. The

charge of hospital accommodation showed opposite trends. The average medical cost paid by each cancer patient showed a steady drop overall. An analysis of patient share of payment by item showed that in the case of hospital accommodation charge, the patient share of total cost drastically dropped but still remained at 40% in 2010, and accounted for the largest share of patient payment off all items. The patient share of the cost of anesthesia was relatively higher than other items remaining at over 30% even after 2005.

Investigation of the state of patient share and that of the National Health Insurance Corporation carried out in this study(Choi et. al., 2010) showed that the total patient share of uninsured items of this study was similar to the actual share as of 2009. Only, the actual patient share of insured items showed a difference from this study. According to this study, it was over 10% in 2009. But an analysis of the state of the corporation's payment for treatment showed it was 5.3% in general hospitals. Because the policy to expand the health insurance coverage was steadily implemented with patient share of payment being 10% after the special coverage of certain items in September 2005 and 5% after December 2009, the results of this study showing the patient share payment as being 10% in 2009 and below 10% in 2010 are deemed to better reflect the actual change in the policy.

Conclusion of Part I

In conclusion, it is necessary to provide comprehensive care for the quality-of-life of cancer patients incorporating with active cancer treatment together with testing and to regularly reevaluate and provide indicators for the qualitative aspect of care. In addition, uniformed coverage is insufficient to enhance the health insurance coverage of cancer. Measures are necessary for the expanding of non-insured items through the introduction of new medical technology.

□ Part 2 : Evaluation of the impact in inequality before and after the enhancement of health insurance coverage of cancer

Methods of Part 2

1) The impact on the equity in health care utilization

This study analyzed the change in the health care utilization, such as visit days, inpatient days, and health expenditure for 5 different income levels, using the National Health Insurance Corporation (NHIC) claims database from 2002 to 2010. We employed a multi-level difference-in-difference model to analyze the change in response to the policy reform. The difference-in-differences estimation compared cancer patients as a treatment group with liver disease and pneumonia patients as control group, and the poorest with the richest. Multi-level model was also conducted to adjust the clustering of year within the same individuals and to obtain correct statistical estimations. Database construction and statistical analysis were performed using SAS version 9.2.

2) The impact on the equity in catastrophic health care expenditures and impoverished through OOP

This study analyzed both catastrophic health expenditure and impoverishment. The probability of individual's experience of catastrophic health expenditure was defined as expenditure exceeding 5%, 10%, and 20% of annual income. The probability of an individual being impoverished through health spending was defined as discretionary income (income less health expenses) falling below the poverty line. We employed a multi-level difference-in-difference model to estimate the impact on OOP payment.

Result of Part 2

1) The impact on the equity in health care utilization

Our results show that the policy significantly increased utilization of both outpatient and inpatient care in cancer patients compared with liver disease and pneumonia patients, and such effects were more salient for people in the lower income groups, making a great contribution to achieving horizontal equity in access to care.

2) The impact on the equity in catastrophic health care expenditures and impoverished through OOP

Our findings reveal that the incidence of catastrophic expenses fell significantly in cancer patients but there was more decrease in the higher socioeconomic groups. On the other hand, there was no significant change in the incidence of impoverishment due to health expenses by socioeconomic groups.

Conclusion of Part 2

In conclusion, the policy has demonstrated advantages in some aspects, especially in the improvement of equity in health care utilization. These results suggest that the policy of reducing OOP payment has a positive impact and improves health care and health inequality although some programs are needed to reduce the OOP burden in the lower income groups.