Benefits Extension of Health Insurance in South Korea: Impacts and Future Prospects

Asia Health Policy Program
Stanford University
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Soonman KWON (School of Public Health, Seoul Nat. Univ.)
and
Sujin KIM (Takemi Fellow, Harvard School of Public Health)

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INTRODUCTION

Background

- Universal coverage of population through mandatory public health insurance (since 1989)

- High out-of-pocket (OOP) payment (about 30% of total health expenditure) has been a key policy challenge for the National Health Insurance in Korea; for example,

    – the incidence of catastrophic payments was much higher in Korea than in other advanced Asian countries such as Taiwan and Hong Kong (Van Doorslaer et al. 2007);

    – the use of advanced care was more concentrated in the rich people (Rhim & Lee 2010; Yoon et al., 2011)

INTRODUCTION

- To increase financial protection for catastrophic illness, the government
  - reduced the cost sharing from 20~50% to 10% for cancer and cardio-cerebrovascular disease and
  - expanded the benefit package for cancer patients in September 2005

- This policy is
  - expected to improve overall access to health care for cancer patients, but
  - not clear in terms of the change in access and financial burden for different socio-economic groups

INTRODUCTION

Policies for Improving Financial Protection

- Actively pursued by progressive governments (Kim DJ, Roh MH)
  - reduced cost sharing for target groups (e.g., inpatient care for children)
  - introduced ceilings on OOP payments for a given time period, and later differentiated the ceilings for different income groups
  - reduced cost sharing for catastrophic conditions (e.g., cancer)

- The Disease-based approach was controversial
  - How to define the catastrophic disease? What are the Criteria for 'catastrophic'?
  - Symbolic value of helping patients with big financial burdens, easy to advertise, rapidly mobilized supporters by creating beneficiaries (e.g., cancer patients) -> preferred by politicians
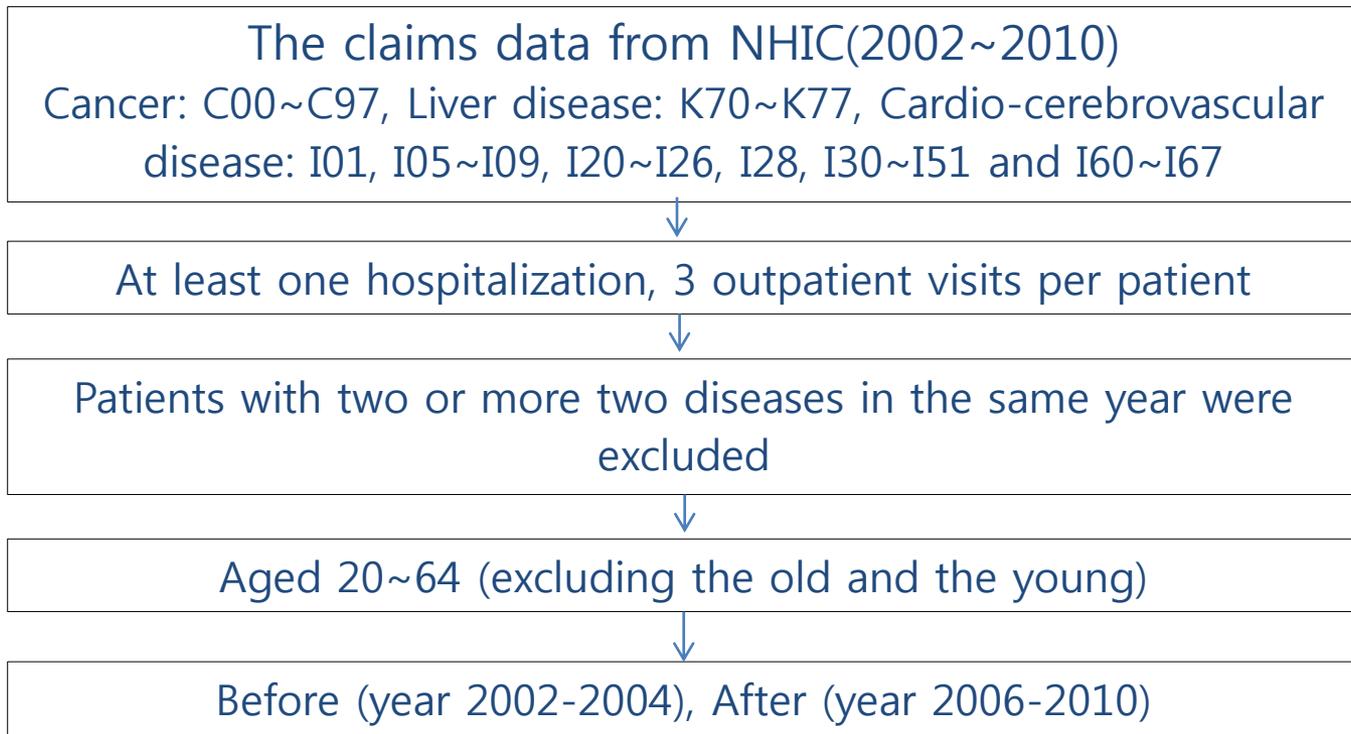
INTRODUCTION

Objective of the Study

- This study examines the impact of the policy change of reducing the OOP payments for cancer patients on equity in health care utilization, the utilization of tertiary care hospitals, and catastrophic payments.

    - Tertiary care hospitals are perceived to provide a higher quality of care, but charge higher fees and higher coinsurance rates

- This study is funded by Korean National Evidence-based Health Care Collaborating Agency (similar to NICE in the UK)

METHODS

- DID (Difference-in-Difference) estimation was employed by comparing cancer patients as a treatment group with patients of liver disease and cardio-cerebrovascular disease as control groups, and the poorest with the richest.

- <u>Control groups were defined as</u>

- Patients of liver disease, who were not entitled to benefit coverage extension

- Patients of cardio-cerebrovascular disease, for whom cost sharing was reduced but in a more limited way, compared to cancer patients: benefits were provided for the patients receiving certain procedures (open heart or brain surgery) for 30 days following their surgery.

METHODS

■ **Data**

| The claims data from NHIC(2002~2010) |
| Cancer: C00~C97, Liver disease: K70~K77, Cardio-cerebrovascular disease: I01, I05~I09, I20~I26, I28, I30~I51 and I60~I67 |

↓

| At least one hospitalization, 3 outpatient visits per patient |

↓

| Patients with two or more two diseases in the same year were excluded |

↓

| Aged 20~64 (excluding the old and the young) |

↓

| Before (year 2002-2004), After (year 2006-2010) |

METHODS

■ **Variables**

Dependent Variables	
Health care utilization	
Annual hospitalization (or visit) days	Negative binomial regression
Health care expenses[1]	Log linear regression
Utilization of tertiary care hospital	
Number[2] of admissions (or visit)	Negative binomial regression
Any admission (or visit) to tertiary hospitals	Logistic regression
Incidence of catastrophic spending	
Expenditure exceeding 10% or 20% of annual income[3]	Logistic regression

- [1] Real health expenditure (2010 as a base) adjusted for health care fee increases; [2] number calculated including zero consumption; [3] Income estimated using health insurance contribution rate.

METHODS

■ **Variables**

Independent Variables	
Demographic characteristics	Gender(male/female)
	Age (continuous)
	Disability (yes/no)
	Death (yes/no)
Socio-economic status	Income quintiles based on national health insurance fee[4]
Policy reform	Before (2002~2004)/After (2006~2010)

- [4] income 5 is the highest quintile

METHODS

- **Empirical Methods: Difference-in-Difference Model**

- Model 1: comparing cancer patients as a treatment group with control groups: liver disease and cardio/cerebrovascular disease

$$y = \beta_0 + \beta_1 \cdot post + \beta_2 \cdot treatment + \beta_3 \cdot post \cdot treatment + \gamma x + \mu$$

- Model 2: comparing cancer patients with a control group and the non-rich with the richest (among 5 income groups)

$$y = \beta_0 + \beta_1 \cdot post + \beta_2 \cdot treatment + \beta_3 \cdot group + \beta_4 \cdot post \cdot treatment +$$

$$\beta_5 \cdot post \cdot group + \beta_6 \cdot group \cdot treatment + \beta_7 \cdot group \cdot post \cdot treatment + \gamma x + \mu$$

- $ß_3$ in model 1 and $ß_7$ in model 2 indicate the effects of the policy on outcome measure (utilization, payment) and on equity across income groups, respectively

METHODS

- **Additional Analysis by Cancer Type**

- To identify whether the policy had differential impact on catastrophic payment across different types of cancers and liver diseases.
- Treatment groups: Patients of gastric cancer, C16, and colorectal cancer, C18~C21, who did not have other multiple cancers
- Control groups: hepatic failure, K72, a relatively more severe liver disease

METHODS

- Added were year variable and its interaction terms with diseases groups to absorb potentially different time trend between diseases.

- Cluster-robust standard errors were estimated by creating 20 clusters using income quintiles by treatment group and gender.

Empirical Results 1.

Equity in Health Care Utilization: Inpatient & Outpatient Care

Inpatient Care Utilization

Variables	Hospitalization Days		Expenditures(Ln)		Exp. per day(Ln)	
	β	se	β	se	β	se
DID model						
Policy*cancer	-0.047*	0.020	-0.031	0.019	0.101***	0.013
TD model						
Policy*cancer*inc1	0.009	0.020	0.087**	0.028	0.079**	0.024
Policy*cancer*inc2	0.025*	0.013	0.082**	0.025	0.053**	0.020
Policy*cancer*inc3	0.008	0.024	0.076	0.039	0.059**	0.022
Policy*cancer*inc4	0.009	0.013	0.038	0.030	0.024	0.020

footnote) * $p<0.05$, ** $p<0.01$, *** $p<0.001$

▶ Policy didn't lead to increase in inpatient care utilization for cancer patients, except for daily expenditure (compared to liver disease patients).

▶ It led to positive impacts on inpatient expenditure and daily expenditures for cancer patients, favoring low-income patients: greater increases for the non-rich (than for the richest, inc5).

Outpatient Care Utilization

Variables	Visit days β		se	Expenditure(Ln) β		se	Exp. per day(Ln) β		se
DID model									
Policy*cancer	0.241	***	0.009	0.392	***	0.010	0.090	***	0.012
TD model									
Policy*cancer*inc1	0.038	*	0.019	0.071	**	0.023	0.060	***	0.010
Policy*cancer*inc2	0.013		0.023	0.059	**	0.022	0.070	***	0.013
Policy*cancer*inc3	-0.001		0.018	0.036		0.019	0.053	***	0.012
Policy*cancer*inc4	-0.002		0.020	0.030		0.018	0.040	**	0.015

footnote) * p<0.05, ** p<0.01, *** p<0.001

▶ Policy had positive impacts on outpatient health care utilization and expenditures more for cancer patients (than for liver disease patients).

▶ It had positive impacts on outpatient care utilization and expenditure, more for the non-rich (than for the richest).

Empirical Results 2.

Equity in the Use of Tertiary Care Hospitals: Inpatient & Outpatient Care

Ratio of the use of tertiary care hospitals in the lowest-income to the highest-income quintile (inpatient)

		Ratio of Number of Admissions			Ratio of Incidence of Admissions		
		Cancer	Liver	CCV	Cancer	Liver	CCV
Pre-	2002	0.82	0.70	0.71	0.87	0.70	0.75
	2003	0.87	0.67	0.72	0.88	0.66	0.75
	2004	0.89	0.68	0.78	0.89	0.66	0.78
Post-	2006	0.93	0.59	0.70	0.88	0.60	0.76
	2007	0.96	0.62	0.75	0.88	0.61	0.76
	2008	1.03	0.64	0.75	0.92	0.64	0.79
	2009	1.03	0.61	0.72	0.90	0.61	0.78
	2010	1.06	0.68	0.82	0.92	0.66	0.77

note) age-gender standardized to the 2010 Korean population; CCV: cardio-cerebrovascular disease; if a value is 1, it means that the lowest income quintile uses as much as the highest income quintile does; a value less than 1 means that the lowest income quintile uses less than the highest income quintile does.

Ratio of the use of tertiary care hospitals in the lowest-income to the highest-income quintile (outpatient)

		Ratio of Number of Visits			Ratio of Incidence of Visits		
		Cancer	Liver	CCV	Cancer	Liver	CCV
Pre-	2002	0.90	0.58	0.73	0.90	0.61	0.73
	2003	0.89	0.58	0.76	0.92	0.62	0.77
	2004	0.91	0.57	0.76	0.88	0.61	0.78
Post-	2006	0.91	0.53	0.74	0.89	0.58	0.77
	2007	0.91	0.56	0.77	0.91	0.61	0.81
	2008	0.94	0.58	0.82	0.96	0.62	0.82
	2009	0.93	0.60	0.79	0.99	0.64	0.86
	2010	0.94	0.63	0.78	0.99	0.67	0.86

note) age-gender standardized to the 2010 Korean population; CCV: cardio-cerebrovascular disease; a value is 1 if the lowest income quintile uses as much as the highest income quintile does; a value is less than 1 if the lowest income quintile uses less than the highest income quintile does.

Hospital (cancer) admissions at tertiary care hospitals compared to patients with liver disease

Variables	Total Number			Any Admission		
	β		se	β	SE	
DID model						
Policy*cancer	0.062	**	0.019	0.085	**	0.029
TD model						
Policy*cancer*inc1	0.250	***	0.027	0.116	***	0.035
Policy*cancer*inc2	0.190	***	0.032	0.046		0.031
Policy*cancer*inc3	0.163	***	0.032	0.077	*	0.038
Policy*cancer*inc4	0.095	***	0.014	0.029		0.032

footnote) * $p<0.05$, ** $p<0.01$, *** $p<0.001$

▶ Policy led to increases in the total number of admissions and any admissions for cancer patients (compared to liver disease patients), especially a greater increase for the non-rich (than for the richest, inc5).

Hospital (cancer) admissions at tertiary care hospitals compared to patients with cardio/cerebrovascular dis.

Variables	Total Number			Any Admission		
	β		se	β	SE	
DID model						
Policy*cancer	-0.058	***	0.015	-0.020		0.024
TD model						
Policy*cancer*inc1	0.160	***	0.037	0.061		0.055
Policy*cancer*inc2	0.123	**	0.045	-0.009		0.047
Policy*cancer*inc3	0.101	*	0.048	0.030		0.062
Policy*cancer*inc4	0.103	**	0.035	0.040		0.051

footnote) * p<0.05, ** p<0.01, *** p<0.001

▶ Policy led to decreases in the total number of admissions for cancer patients (compared to cardio/cerebrovascular-disease patients) but smaller decreases (or greater increases) in the non-rich groups.

Hospital (cancer) outpatient visits at tertiary care hospitals compared to patients with liver disease

| Variables	Total Number			Any Visit		
	β		se	β	SE	
DID model						
Policy*cancer	0.321	***	0.017	0.228	***	0.026
TD model						
Policy*cancer*inc1	0.052		0.050	0.067	*	0.033
Policy*cancer*inc2	0.045		0.035	0.038		0.026
Policy*cancer*inc3	0.028		0.034	0.049		0.029
Policy*cancer*inc4	0.024		0.046	0.034		0.039

footnote) * $p<0.05$, ** $p<0.01$, *** $p<0.001$

▶ Policy led to increases in total number of visits and any visits for cancer patients (compared to liver disease patients), but the amount of the impact is rarely different across different income groups.

Hospital (cancer) outpatient visits at tertiary care hospitals compared to patients with cardio/cerebrovascular dis.

Variables	Total Number			Any Visit		
	β		se	β	SE	
DID model						
Policy*cancer	0.187	***	0.011	0.123	***	0.020
TD model						
Policy*cancer*inc1	-0.001		0.030	0.045		0.043
Policy*cancer*inc2	-0.018		0.031	0.007		0.044
Policy*cancer*inc3	-0.019		0.038	0.041		0.056
Policy*cancer*inc4	0.004		0.033	0.035		0.049

footnote) * $p<0.05$, ** $p<0.01$, *** $p<0.001$

▶ Policy led to increases in the total number of visits and any visits for cancer patients (compared to liver disease patients), but the size of the impact was not different across different income groups.

No. of Admissions to Tertiary Care Hospitals
Ratio of use in the low income to the highest income quintile
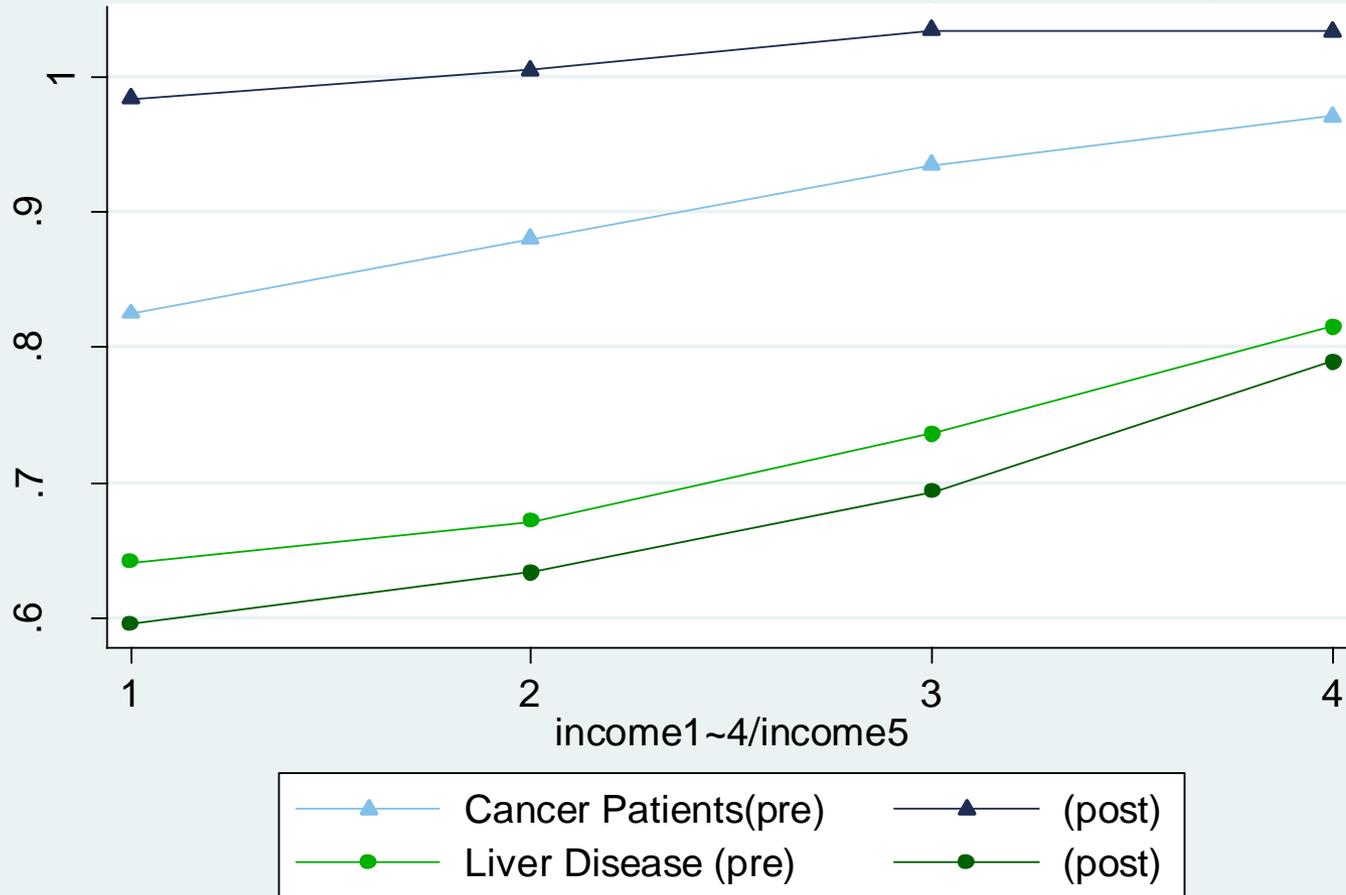
Note: (pre) for before-policy, (post) for after-policy

No. of Visits to Tertiary Care Hospitals
Ratio of use in the low income to the highest income quintile

Legend:
- Cancer Patients(pre) — (post)
- Liver Disease (pre) — (post)

x-axis: income1~4/income5
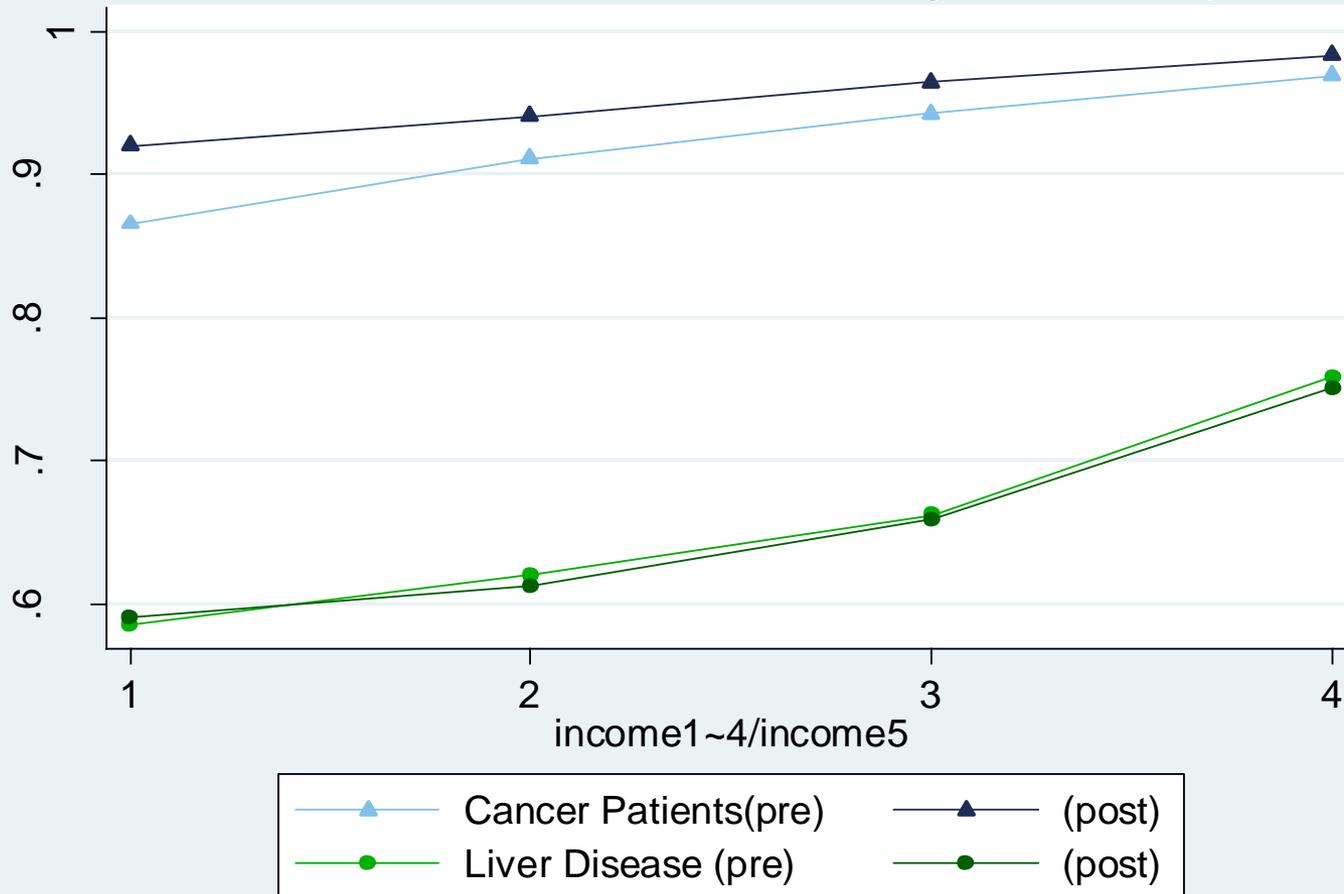
Note: (pre) for before-policy, (post) for after-policy

Empirical Results 3.

Catastrophic Payment for Health Care

Incidence of catastrophic payment of cancer patients compared to patients with liver disease

Variables	Threshold 10%			Threshold 20%		
	β		se	β		se
DID model						
Policy*cancer	-0.416	***	(0.062)	-0.625	***	(0.107)
TD model						
Policy*cancer*inc1	0.293	*	(0.150)	0.796	**	(0.274)
Policy*cancer*inc2	0.130		(0.140)	0.681	*	(0.268)
Policy*cancer*inc3	0.086		(0.136)	0.421		(0.268)
Policy*cancer*inc4	0.066		(0.145)	0.032		(0.268)

▶ Policy has reduced incidence of catastrophic payments for cancer patients (compared to liver disease patients),

▶ but the impact on (i.e., the reduction in) catastrophic payments is smaller for the non-rich (than for the richest): i.e., the richest have experienced a larger reduction in catastrophic payments.
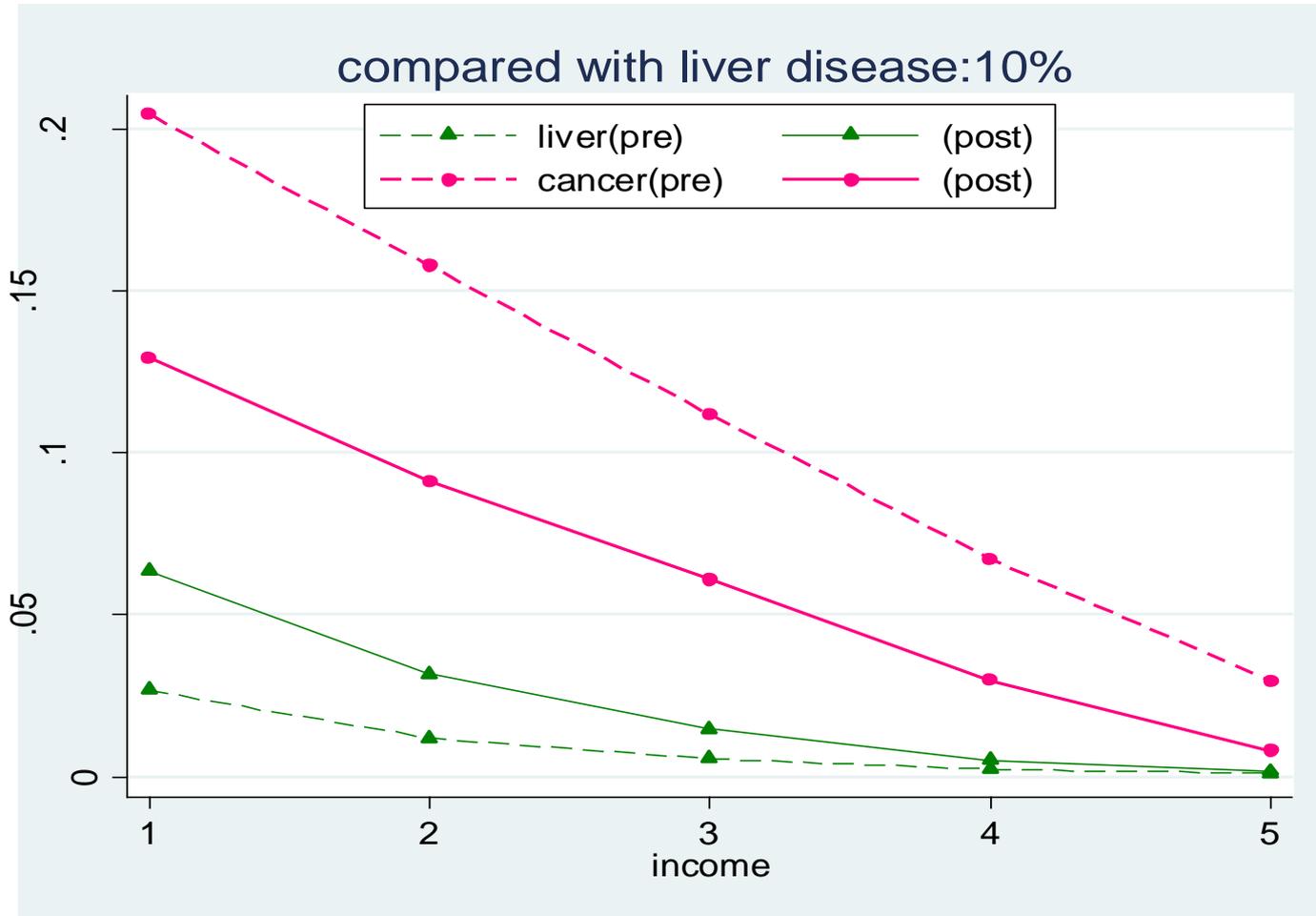
incidence of catastrophic payment of cancer patients compared to patients with cardio/cerebrovascular dis.

Variables	Threshold 10%			Threshold 20%		
	β		se	β		se
DID model						
Policy*cancer	-0.387	***	(0.064)	-0.292	*	(0.139)
TD model						
Policy*cancer*inc1	0.544	***	(0.134)	1.424	***	(0.180)
Policy*cancer*inc2	0.533	***	(0.132)	1.566	***	(0.184)
Policy*cancer*inc3	0.494	***	(0.139)	1.274	***	(0.175)
Policy*cancer*inc4	0.462	***	(0.137)	0.543	**	(0.168)

▶ Policy has reduced catastrophic payments for cancer patients (compared to cardio/cerebrovascular disease patients),

▶ but the impact on (i.e., the reduction in) catastrophic payments is smaller for the non-rich than for the richest: i.e., the richest have experienced a larger reduction in catastrophic payments.

Incidence of catastrophic payment by cancer type compared to patients with hepatic failure

Variables	Gastric Cancer			Colorectal Cancer		
	β		se	β		se
DID model						
Policy*cancer	-0.919	***	(0.134)	-0.784	***	(0.111)
TD model						
Policy*cancer*inc1	1.149	**	(0.448)	1.182	**	(0.369)
Policy*cancer*inc2	0.861		(0.442)	1.097	**	(0.381)
Policy*cancer*inc3	0.404		(0.445)	0.862	*	(0.370)
Policy*cancer*inc4	0.364		(0.448)	0.924	*	(0.380)

footnote) * $p<0.05$, ** $p<0.01$, *** $p<0.001$

▶ Policy has reduced catastrophic payments for cancer patients (compared to hepatic failure),
▶ but the impact on (i.e., the reduction in) catastrophic payments is smaller for the non-rich than for the richest.

Incidence of Catastrophic Payment

compared with liver disease:10%

Legend:
- liver(pre) — before-policy
- (post)
- cancer(pre)
- (post)

x-axis: income (1–5)

Note: (pre) for before-policy, (post) for after-policy
Predicted probability of catastrophic expenditure across income groups, assuming male patients with a median age of 46, no death and no disability

CONCLUSION

■ Health Care Utilization

• The policy change to expand NHI benefit coverage for cancer patients had positive impacts on health care utilization in outpatient care, though not in inpatient care (compared to patients of liver disease); the positive impacts were greater for poor patients, resulting in improvement in equity in health care utilization.

CONCLUSION

- ■ Use of Tertiary Care Hospitals

- • The policy had positive impacts on the inpatient utilization of tertiary care hospitals, measured by initial access and number of admissions, (compared with patients of liver disease and cardio-cerebrovascular disease), but not on outpatient utilization.

- • Income-inequality in the use of outpatient care of tertiary care hospital remained prominent following implementation of the policy.

CONCLUSION

- Unmet-need of advanced care (tertiary care hospital) may have been higher in the inpatient sector than in the outpatient sector among low-income cancer patients

    - The association between income groups and the use of tertiary hospital care were more prominent in the inpatient sector than in the outpatient sector among cancer patients before the policy change.

CONCLUSION

■ Incidence of Catastrophic Payment

• This policy change also had positive impacts on the reduction in catastrophic health care payments of cancer patients (compared with patients of liver disease and cardio-cerebrovascular disease).

• However, non-poor cancer patients have experienced a larger reduction in catastrophic payments than poor cancer patients have, contrary to the intention of the policy.

CONCLUSION

- Smaller reductions in catastrophic payment for poor cancer patients may mean that the policy reduced the financial barriers for the poor and reduced their unmet needs.

- That is, increased health care utilization by the poor as a result of the policy (i.e., reduction in financial barriers) may lead to smaller reductions in their catastrophic payments compared with the rich
  -> Measurement of catastrophic payment: No health care utilization results in no catastrophic payments at all

CONCLUSION

■ Policy Implication

• Further research on the barriers that prevent low-income people from accessing advanced services need to be conducted to promote equitable access to health care.

• The government needs to consider additional policy measures to increase financial protection for the poor as the poor pay a higher proportion of their resources for health care than the rich households do.

LIMITATIONS

- No data on disease stages of patients : hope that survival/death and disability variables in the model can control for the severity of patients' cancer.

- DID estimators require an assumption that the control group would have experienced the same trend over time that the treatment group has.
  - ➢ Gaps between the richest and the poorest rarely have different trends across different disease groups and,
  - ➢ we added the year variable and their interaction term with disease groups to adjust for potentially different time effects.

LIMITATIONS

- No data for utilization or expenditure of uninsured services (services not included in health insurance benefit packages):

Cannot examine the change in *total* financial burdens on patients as a result of the policy change

-> Providers may respond to the policy change by increasing the provision of uninsured services (e.g., demand inducement).

The effect of extension of benefit coverage for cancer patients on health care utilization across different income groups in South Korea

Sujin Kim · Soonman Kwon

Abstract To provide financial protection against catastrophic illness, the Korean government expanded the National Health Insurance (NHI) benefit coverage for cancer patients in 2005. This paper examined whether the policy improved the income-related equality in health care utilization. This study analyzed the extent to which the policy improved income-related equality in outpatient visits, inpatient days, and inpatient and outpatient care expenditure based on triple difference estimator. Using nationwide claims data of the NHI from 2002 to 2004 and from 2006 to 2010, we compared cancer patients as a treatment group with liver disease as a control group and low-income group with the highest-income group. The results showed that the extension of NHI benefits coverage led to an increase in the utilization of outpatient services across all income groups, but with a greater increase for the low-income groups, among cancer patients. Moreover, the policy led to a less decrease in the utilization of inpatient services for the low-income group while it decreased across all income groups. Our finding suggests that the extension of NHI benefits coverage improved the income-related equality in health care utilization.

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Has the National Health Insurance improved the inequality in the use of tertiary-care hospitals in Korea?

Sujin Kim [a,b,c], Soonman Kwon [a,b,*]

[a] National Evidence-based Healthcare Collaborating Agency (NECA), 28-7 Wonnam-dong, Jongno-gu, Seoul 110-450, South Korea
[b] School of Public Health, Seoul National University, Kwanak-ro, Kwanak-gu, Seoul 151-742, South Korea
[c] Takemi Program, Harvard School of Public Health, 665 Huntington Ave., Boston, MA 02115, United States

ARTICLE INFO

ABSTRACT

Background: To improve financial protection against catastrophic illness, the Korean government expanded the benefit coverage of the National Health Insurance (NHI) for cancer patients in 2005. This paper examined whether the policy has reduced income-inequality in the use of tertiary care hospitals.

Methods: We evaluated the effect of the policy on income-inequalities in outpatient visits and inpatient admissions to tertiary care hospitals, based on triple difference estimators. Using nationwide claims data of the NHI from 2002 to 2010, we compared cancer patients as a treatment group with liver disease and cardio-cerebrovascular disease as control groups and the lower-income with the highest-income group.

Results: Before the introduction of the policy, lower-income cancer patients utilized less inpatient and outpatient services in tertiary care hospitals than high-income patients did. After the benefit coverage was expanded, while the incidence and total number of inpatient admissions to tertiary care hospitals increased among cancer patients compared with liver diseases, lower-income cancer patients experienced a greater increase than those of higher-income did compared with both diseases. The use of outpatient services increased more in cancer patients than those of both diseases; however, the gap between the highest- and the lowest-income rarely decreased, except the incidence of visits when compared to liver disease.

Conclusion: Our findings indicated that the expanded NHI benefits coverage partially improved income-related inequalities in inpatient admissions to tertiary-care hospital, but not in outpatient visits.

Future Policy Issues for financial protection: Why OOP payment is high in Korea?

Providers have strong incentives to increase the provision of un-covered services (Rapid adoption of new medical technology, new services)

- Fee-for-service payment system

- No price regulation of un-covered services

-> For financial protection, government needs to regulate the provision of un-insured services, which cannot be justified based on cost-effectiveness

Related research: impact of 2009 policy (coinsurance rate 10%->5%), based on household survey (panel) that includes payment for uncovered service

-> Little impact of the policy (Kim, Kim and Kwon, 2014)

Issues in Benefits Design

1. Which Services to Cover

Health insurance system faces an increasing pressure of cost containment for financial sustainability:

Cost-effectiveness has been increasingly adopted as a key criterion for benefit package decisions

-> E.g., positive listing of medicines in Korea

2. At How Much Cost Sharing (by Patients)

Cost sharing rate can be differentiated to improve equity and financial protection for vulnerable population

- Low cost sharing (or ceiling on total cost sharing) for the poor
- Low cost sharing for catastrophic expenditure

3. Decision Making Process and Criteria

The decisions on which services to cover at which level of patient cost sharing should be based on objective criteria through a (formalized) transparent policy process

- Instead of a single criterion, various factors need to be considered in the decision making
- E.g., cost effectiveness, medical necessity, financial burden on patients, impact on the fiscal status of health insurance
- Inherently *priority setting* process associated with *value* judgment, for example, whether to provide small benefits to a larger number of patients or large benefits to a small number of patients

Experiment for Benefits Decision Process in Korea

- <u>Citizen participation</u> (discussion and deliberation for 2 days) for value judgment in benefit decisions: Accountability for Reasonableness, suggested by N. Daniels

- Fairness in process or procedural justice

- Generation of objective evidence by experts, but value judgment by lay person/payer/citizen

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THANKS !