

Analysis of Factors Affecting Catastrophic Healthcare Expenditure

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Abstract

Catastrophic healthcare expenditure refers to a case where healthcare expenditure of a household exceeds a specific limit, and it is on the rise every year as Korea is facing the aging population, which is three to four times faster than other developed countries and the resulting poverty rate for the elderly. The present study analyzes the main factors of catastrophic healthcare expenditure and their changes by year, based on data from the Korea Health Panel. One of the reasons for such increase was the change in economic activity: The increase in catastrophic healthcare expenditure for those who stopped economic activity in Model IV was 1.4 times higher than that for those who have never been in economic activity for the said period. In the present study, changes in economic activity and income showed high correlation with the level of catastrophic healthcare expenditure and the group in which their economic activity has changed faced more catastrophic healthcare expenditure due to the low coverage of the National Health Insurance.

Keywords: .Catastrophic Healthcare Expenditure, Korean Health Panel, Type of Economic Activity

1. Introduction

The national health insurance system was introduced in Korea in 1977, and it took 12 years² to provide insurance coverage to the whole nation in 1987. It has continuously grown in volume until now but a restricted 'low burden, low coverage' structure of the early days is still in effect. [1]. The priority of the system is to protect the people from health risks and the consequent economic risks, however the public share in the national healthcare expenditure in Korea was 55.9% in 2013, much lower than the average rate (72.7%) for OECD member countries. On the contrary, the people's share in healthcare expenditure was 36.9%, twice higher than the OECD average (19.5%); moreover, the rate of insolvent households whose healthcare expenditure accounts more than 40% of the disposable income reached 4.49%, the highest among OECD members . That is why it has been continuously pointed out that the national health insurance of Korea does not function adequately due to its low coverage[2].

Catastrophic healthcare expenditure arises when the healthcare spending of a household exceeds the specific criteria[3]. It is the most frequently-used indicator when measuring the healthcare burden of a household or the level at which the low-income group finds it difficult

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to afford. Changes in households' catastrophic healthcare expenditure indicate indirectly the effectiveness of a national healthcare policy which aims for wide coverage and in detail, the effects of healthcare expenditure to a household or an individual[4]. WHO has already used catastrophic healthcare expenditure as one of the indicators of health equity. Catastrophic healthcare expenditure occurs when the individual's healthcare expenditure to total income (T/x) excluding food costs or total spending excluding food costs (T/y) exceeds specific criteria (normally between 5% to 40%)[5]. Generally, catastrophic healthcare expenditure occurs when 40% or more of the total income is spent on healthcare although it needs to be adjusted from country to country according to the country's circumstances. When catastrophic healthcare expenditure occurs in a household, its net disposable income decreases and the quality of life begins to falter. Further, long-term healthcare expenditure may lead to the impoverishment of the entire household. Excessive healthcare expenditure may lead to the restricted use of essential healthcare services. Consequently, this makes the health condition and the quality of life worse, which consequently leads to impoverishment, while affecting each other in a vicious cycle[6].

Accordingly, the present study analyzes the main factors of catastrophic healthcare expenditure and annual changes in such factors for three years between 2012 and 2014, based on data used in the 'Korea Health Panel' that examines the nation's utilization of healthcare services and annual healthcare spending.

2. Research Method

2.1. Objects and Methods of Research

The present study used the raw data used in the surveys, namely, "Korea Health Panel for 2012, 2013 and 2014" of the Korea Institute for Health and Social Affairs and the National Health Insurance Corporation. The present study selected 15,630 household members for 2012, 14,618 for 2013 and 13,949 for 2014, with 5,434 households for 2012, 5,200 for 2013 and 4,977 for 2014.

The present study conducted statistical analysis using the SPSS 21.0 program. To understand the characteristics of the target households and their members, frequency analysis was conducted. To understand the factors affecting the catastrophic healthcare expenditure of the said targets, the odds ratio was obtained through polynomial logistic regression.

2.2 Definition of Variables

2.2.1. Sociodemographic Characteristics:

For the sociodemographic variables used in the present study, household members were characterized by gender, age and marital status, while households were characterized by income quintile and National basic livelihood guarantee system supply.

2.2.2. Economic Activity:

As for the variables for change in economic activity, the question "Do you work for income?" receives two types of answer: 'Yes' for economic activity and 'No' for non-economic activity. More detailed, a subject that responded with 'Yes' for the last year and the relevant year is categorized as 'Economic Activity Type 1'; a subject that responded with 'Yes' for the last year but 'No' for the relevant year is categorized as 'Economic Activity Type 2'; a subject that

responded with 'No' for the last year but 'Yes' for the relevant year is categorized as 'Economic Activity Type 3'; and a subject that responded with 'No' for both is categorized as 'Economic Activity Type 4' (Table 1).

Table 1. Description of variables concerned

Variables	Description
Dependent Variables	
Catastrophic healthcare expenditure	10%, 20%, 30%, 40%
Independent Variables	
Sociodemographic Characteristics(Household Members)	
Gender	Male or female
Age	Under 40, 40 to 64, 65 and over
Marital Status	Single or married
Sociodemographic Characteristics(Households)	
Income Quintile	1quartile, 2 quartile, 3 quartile, 4 quartile, 5 quartile
National Basic Livelihood Guarantee System Supply	Yes or no
Economic Activity	
Change in Economic Activity Type	Economic activity 1 (active), Economic activity 2 (active → inactive)
	Economic activity 3 (inactive → active), Economic activity 4 (Inactive)

2.2.3. Catastrophic Healthcare Expenditure:

In the present study, criteria of catastrophic healthcare expenditure is set into four groups of 10%, 20%, 30% and 40%. payment capability is set by the total household spending with food costs (essential living expense) excluded.

$$CHE = \frac{\text{Household's direct spending on healthcare}}{\text{Total household spending} - \text{food costs}} \geq 10\%, 20\%, 30\%, 40\%$$

CHE: Catastrophic healthcare expenditure

3. Conclusion

3.1. Factors Affecting the Occurrence of Catastrophic Healthcare Expenditure(2012)

As for household members, in the segment with over-40% spending, 'age 65 and older' is 5.67 times higher than 'age under 40' (p<.001), while those with a history of chronic diseases, 'yes' is 1.75 times higher than 'no' (p<.01). As for the change in economic activity type, "active

in 2011 → inactive in 2012” is 1.79 times higher than those who fall under “non-economic activity consistently.” (p<0.1) (Table 2).

Table 2. Factors affecting catastrophic healthcare expenditure (2012)

Variable	Catastrophic healthcare expenditure								
	10% ≤		20% ≤		30% ≤		40% ≤		
	Exp (B)	95% CI	Exp (B)	95% CI	Exp (B)	95% CI	Exp (B)	95% CI	
Characteristics of Household Members									
Age	65 and higher	2.19** *	1.84-2.60	2.72***	2.00-3.71	3.85***	2.60-5.73	5.67***	3.90-8.25
	40~64	0.97	0.82-1.15	0.96	0.70-0.31	1.06	0.70-1.60	1.24	0.83-1.85
	Under 40	1	1	1	1	1	1	1	1

Economic Activity Type	1 ¹⁾	0.98	0.87-1.11	0.98	0.80-1.20	0.78	0.61-1.00	0.92	0.73-1.17
	2 ²⁾	1.22*	1.02-1.57	1.59*	1.08-2.33	1.63**	1.38-2.23	1.79**	1.19-2.70
	3 ³⁾	1.15	0.91-1.45	1.51*	1.04-2.19	0.85	0.50-1.47	1.41	0.90-2.20
	4 ⁴⁾	1	1	1	1	1	1	1	1
Characteristics of Households									
Income Quintile	1 quartile	4.07** *	3.02-5.48	7.40***	4.27-12.80	8.75***	7.29-13.19	9.14***	7.18-15.40
	2 quartile	2.38** *	1.81-3.14	4.21***	2.47-7.17	7.93***	3.07-20.47	6.52***	2.92-14.59
	3 quartile	1.78** *	1.35-2.34	1.87*	1.05-3.34	5.06**	1.92-13.31	4.53***	1.99-10.31
	4 quartile	1.34	1.00-1.79	1.69	0.93-3.08	2.82	1.00-7.95	2.25	0.91-5.56
	5 quartile	1	1	1	1	1	1	1	1

*p<.05, **p<.01, ***p<.001

1) With on-going economic activity, 2) Economic activity → non-economic activity,

3) Non-economic activity → economic activity, 4) Continued non-economic activity

3.2. Trend of Influential Factors

As for economic activity types, from 2012 to 2014, compared with 'economic activity type 4', 'economic activity type 2' shows an inconsistent pattern with the trend (Unit: times): 1.22 → 1.35 → 1.26 on '10% ≦'; 1.59 → 1.57 → 1.23 on '20% ≦'; 1.63 → 1.81 → 1.38 on '30% ≦'; and 1.79 → 2.16 → 2.53 on '40% ≦' (Figure 1).

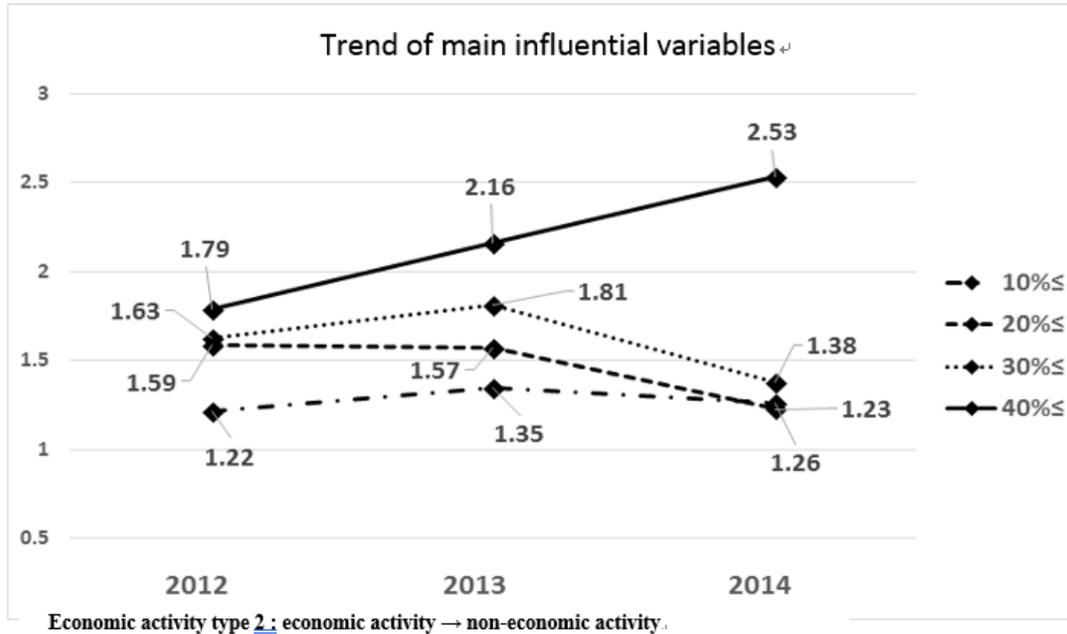


Figure 1. Trends of main influential variables (Economic activity type2)

4. Considerations and Conclusion

In the present study, factors of occurrence of catastrophic healthcare expenditure are divided by sociodemographic characteristics, insurance coverage type, and economic activity types for a polynomial regression in order to analyze those factors based on relevant variables and years. Resulting from the logistic regression with significant predictor variables having influences on the occurrences of that expenditure, a statistically significant influence is found to be common in variables like income quintile, age and economic activity type from 2012 to 2014, with an annual upward trend. To see that in detail, it is matched with researches of Son S et al[7] and Kim T et al[8]. that the lower the income quintile, the higher the occurrence rate of catastrophic healthcare expenditure. Also, the older age, the higher the rate. From the conclusion of Park E et al[9], the catastrophic healthcare expenditure is heightened with old age, low income, and chronic diseases. As for economic activity type, a higher influence appears in common for all the three years in the group who had acted economically but then has stopped the economic activity, compared with the group under non-economic activity. In Lee M's research in 2014, it has also been concluded that in the group whose members transfer to 'medical benefit' from 'healthcare insurance,' the occurrence rate increased by 3.55 times. In other words, those who worked for income but stopped working appears more vulnerable to the occurrence of the said spending than those who have stayed at a state of non-economic activity. Hence it may be analyzed that personal income is a more critical factor to that occurrence.

In conclusion, the present research analyzes that changes in economic activity and its resultant income changes are deeply inter-related to the occurrence of catastrophic healthcare expenditure. Consequently, national policies are regarded as effective for the low-income quintile group but not for the group whose status of economic activity changes thus experiences more catastrophic healthcare expenditure due to lower coverage of social security. It is recommended that a firm policy to reduce that spending be prepared while strengthening the social security for the latter.

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