



Equity in Household Health Care Expenditures in Korea

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Dear Editor-in-Chief

Mandatory medical expenditures needed for guaranteeing health must be determined rationally in terms of the capacity to pay, which decides the possibility of the action for promoting health. The irrational decision of the mandatory medical expenditures would be the main issue of the health inequality in this sense (1).

The health level of each household can be affected by personal factors but also affected a lot by social factors such as the capacity to pay, and therefore, it is crucial to consider the social factors including the capacity to pay (2-4).

Considering those aspects, this study analyses the actual condition of guaranteeing the right to health in Korea, considering the capacity to pay. For these research questions, we investigated the burden on health care expenditures (“HCE” hereafter) and the effect of HCE on vertical and horizontal equity for overall households in Korea. This study used the NaSTaB (National Survey of Tax and Benefit) household panel dataset, collected and provided by the Korea Institute of Public Finance, a government-sponsored research institute, annually since 2007.

Evaluating equity of HCE, vertical equity (VE) checks if the burden of HCE also increases progressively as the capacity to pay, household income, grows bigger, while horizontal equity (HE) checks if the ratio of HCE keeps constant within

each income groups. Though VE itself shows the inequality in paying HCE, HE is also meaningful since the differences can be occurred by various socioeconomic factors.

Measuring VE, the Kakwani index (K), the most representative progressivity index, is adopted like Equation [1]. As suggested by OECD (5), household income, the proxy for the capacity to pay, is divided by the square root of the number of household members to consider the economies of scale. “Ex-ante” household income is distinguished from “ex-post” household income, which is calculated by subtracting HCE net of medical expenses credit, enacted in the Individual Income Tax Law of Korea, from original household income (ex-ante household income). Specifically, the medical expense credit provides support for HCE when an individual’s HCE amount to more than 3% of his/her income and his/her HCE are greater than a certain amount, and consequently this study reflects a special feature of Korean tax system as well as equity issues on HCE.

$K=C(H)-G(I_0)$Equation [1]

Where K: Kakwani index; C: concentration index with the weights being determined by I_0 ; H: HCE; G: Gini coefficient; I_0 : ex-ante adjusted household income.



If K is positive (negative), HCE are progressive (regressive) as the capacity to pay, adjusted household income, grows bigger.

Next, the Reynolds-Smolensky index (R), the most representative redistribution index, is adopted to measure how redistributive HCE are like Equation [2].

$$R = G(I_0) - G(I_1) \dots \dots \dots \text{Equation [2]}$$

Where R : Reynolds-Smolensky index; I_1 : ex-post adjusted household income.

If R is positive (negative), it can be interpreted that HCE have positive (negative) effect on income redistribution - that is, HCE increase (decrease) vertical equity.

Next, Equation [3] shows the relationship between progressivity index and redistribution index. Since horizontal inequity allows the possibility of different HCE's ratio within same income group, Equation [3] decomposes the redistribution effect, measured by R , into VE, HE and ranking mobility (RM), and helps to distinguish both VE and HE from RM (6). For analysis of this study, I classified 10 ex-ante household in-

come groups every year in the period of recent 10 years, from 2008 to 2017.

$$R = \{(H/I_1) \times K\} - \sum_i (P_i Q_i) G_i - (G(I_1) - C(I_1)) = VE - HE - RM \dots \dots \dots \text{Equation [3]}$$

Where P_i : proportion of population for each income group; Q_i : proportion of HCE for each income group; G_i : Gini coefficient within each income group.

Dividing Equation [3] by R , I can get Equation [4]. By means of the decomposition in Equation [4], (VE/R) shows how much vertical inequality of HCE influences overall income redistribution, and (HE/R) and (RM/R) show how much horizontal inequality and ranking mobility of HCE contribute to the overall effect respectively.

$$1 = (VE/R) - (HE/R) - (RM/R) = (VE/R) - \{(HE+RM)/R\} \dots \dots \dots \text{Equation [4]}$$

Table 1 shows the results of this study. Negative Kakwani indices (K) in research period imply that HCE are regressive as the capacity to pay grows bigger in Korea. Positive Reynolds-Smolensky indices (R) imply that HCE have positive effect on income redistribution. No specific trends of K and R can be found in the period.

Table 1: Calculation of the Kakwani index (K) and the Reynolds-Smolensky index (R), and the decomposition of R in Korea, 2008-2017

Year	K	R	Decomposition of R		
			(VE/R)%	-(HE/R)%	-(RM/R)%
2008	-0.328	0.125	-0.9	-7.7	108.6
2009	-0.256	0.110	-2.1	-7.5	109.6
2010	-0.269	0.106	-2.9	-7.5	110.4
2011	-0.294	0.110	-0.6	-8.7	109.3
2012	-0.284	0.111	-2.5	-7.0	109.6
2013	-0.261	0.105	-0.4	-8.4	108.8
2014	-0.290	0.109	-0.5	-8.1	108.6
2015	-0.297	0.096	-2.2	-7.9	110.1
2016	-0.337	0.111	-2.8	-7.7	110.5
2017	-0.358	0.110	0.4	-9.3	108.9
Average	-0.297	0.109	-1.4	-8.0	109.4

Moreover, our results showed that, out of income-redistribution effect of HCE, ranking mobility of HCE contributes more than the effect itself (109.4% on average) while both vertical and horizontal equity rather deteriorate the effect (-

1.4% and -8.0% on average respectively). That is, the income-redistribution effect of HCE in Korea has proved to mainly derive from its effect on ranking mobility.

Conflict of interest

The author declares that there is no conflict of interest.

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