Using the Taiwan National Health Insurance Database to Design No Claim Discount in Hospitalization

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Abstract

Taiwan's population aging is speeding up due to lower fertility and mortality rates. The proportion of population aged 65 and over (or the elderly) is expected to reach 20% in 2025, a big jump from 7% in 1993. Taiwan is also experiencing a huge and steady increment in life expectancy, about 15 years for the past 50 years or 0.3 year annually. Living longer is now a common phenomenon in Taiwan and the retirement arrangement becomes popular and essential. However, comparing to the economic need, the healthcare need for the elderly does not receive as much attention, despite that the annual per capita medical expense for the elderly is about 4.6 times of the national average (source: Taiwan Medical Association). Although the medical/health insurance policies only accounts for less than 10% of all commercial insurance policies in Taiwan, it is expected to gain ground when there are more elderly.

It should be noted that the longevity risk issue also applies to the medical insurance products, as well as the annuity products. Taiwan's interest rate for insurance policies was around 6%~8% in the early 2000's, comparing to 2%~3% in the recent years. Longer life and higher policy interest would create loss to the insurance companies, and the companies are thus conservative in pricing new medical insurance products. In order to reduce the burden on policyholders, many insurance companies in Taiwan adapt the concept of car insurance's no claim discount (NCD) and apply it to the whole-life medical policies. The insured with better medical records can receive discount in premiums.

In this study, we use Taiwan's national health insurance database to explore the no

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claim discount probability for the in-patient visit. The data considered are the longitudinal health insurance database 2005 (LHID2005)[4], which contains about 5% sample of Taiwan population. We found the premiums calculated under the assumption that no-claim discount events are independent are under-estimated. We also use copula approach to model dependency structures of no claim discount distribution in hospitalization and calculate inpatient rate, average length of stay, readmission rate within 7, 14, 30, 60, 90 days to provide the reference for insurance company.

Key words: Longevity Risk, No Claim Discount (NCD), Medical Insurance, National Healthcare Insurance (NHI), In-patient Visit

[4]LHID2005 contains all the original claim data of 1,000,000 beneficiaries enrolled in year 2005 randomly sampled from the year 2005 Registry for Beneficiaries (ID) of the Taiwan National Health Insurance Research Database (NHIRD), where registration data of everyone who was a beneficiary of the National Health Insurance program during the period of Jan. 1st 2005 to Jan. 1st, 2006 were drawn for random sampling and the observation years are from 1996 to 2011.