

ABSTRACT

The high incidence of catastrophic diseases in Indonesia, especially Chronic Kidney Disease (CKD), Diabetes Mellitus (DM), hypertension, and heart disease, necessitates Long Term Care and process a significant risk of financial loss. To minimize the risk, insurance products designed according to the characteristics of chronic diseases are needed. This study aims to model the transition probabilities of catastrophic diseases using a four state markov chain and calculate the single premium for Long Term Care: Annuity as A Rider Benefit insurance. The data used is sourced from disease prevalence (Indonesia Healty Survey, 2023) and mortality table (TMI, 2019). The multi state model defines four transition states: healthy, suffering from catastrophic diseases, death due to catastrophic diseases, and death due to causes other than catastrophic diseases, where the transition probabilities between state are defined based on prevalence and mortality rates, assuming one way transition. The results show that the markov chain transition matrix was successfully used to determine the probability of changing state. This probability was then implemented in the formulation of the actuarial value to calculate the single premium. It was found that amount of the single premium is significantly influenced by the age of the insured's age at the policy agreement and the duration of the insurance coverage, where the older the age and the longer the coverage period, the greater the premium that must be paid.

Keywords: Markov Chain, Catastrophic Diseases, Single Premium, Long Term Care: Annuity as A Rider Benefit.