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# Using Taiwan National Health Insurance Database to Model Cancer Incidence and Mortality Rates

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## Abstract

The increasing cancer incidence and decreasing mortality rates in Taiwan worsened the loss ratio of cancer insurance products and created a financial crisis for insurers. In general, the loss ratio of long-term health products seems to increase with the policy year. In the present study, we used the data from Taiwan National Health Insurance Research Database to evaluate the challenge of designing cancer products. We found the Lee-Carter and APC models have the smallest estimation errors, and the CBD and Gompertz models are good alternatives to explore the trend of cancer incidence and mortality rates, especially for the elderly people. The loss ratio of Taiwan's cancer products is to grow and this can be deemed as a form of longevity risk. The longevity risk of health products is necessary to face in the future, similar to the annuity products.

**Keywords:** Cancer Insurance, Longevity Risk, Big Data, Stochastic Models, National Health Insurance

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