Investigating ‘tiered benefits’ dread disease products

Our involvement with the original design of tiered dread disease products means that we have accumulated a large database of claims, which in turn, has provided us with the opportunity to analyse our data with a large degree of credibility. This article is an introduction to how the emerging experience from the insured population can be used to provide information that can be used to improve the pricing of tiered dread disease policies.

The development of dread disease products

Pioneered in South Africa, dread disease products (critical illness products) have steadily become available in most of the world’s insurance markets. The conditions covered typically include illnesses such as cancer, heart attack, CABG and stroke. The products were initially designed so that the policy paid out a fixed cash amount on the diagnosis of specified illnesses, for example, the policy would specify that ZAR 1 million would be payable to the life assured if he had suffered a heart attack.

Since the launch of dread disease products in 2000, there have been various innovations and improvements in the benefits offered by life assurance companies. One of the most important developments was the introduction of ‘tiered benefits’. A tiered dread disease product enables the policyholder to receive a payout of less than 100% of the sum assured if the condition is of a lower pre-defined severity. For example, the product could specify that the payout for suffering a heart attack depends on the severity of the heart attack therefore a policy with a ZAR 1 million sum assured could pay 25%, 50%, 75% or 100% of the ZAR 1 million based on a specific medical definition of the severity of the heart attack.

The tiered dread disease product has several advantages:

- Policyholders are able to obtain insurance cover for less severe instances of illnesses (more comprehensive cover).
- Greater policyholder satisfaction is achieved since multiple payments are possible.
- Policyholders can closely match their financial needs in the event of a dread disease.
- The dread disease policies are more affordable.
- There is greater scope for insurance companies to differentiate themselves in the market place (although this has made comparison of products across companies more difficult to achieve).
Terminology

CABG: a coronary artery bypass graft

Insured population: the proportion of the country’s population that have life assurance cover

A stage of cancer: cancer is classified into four stages. These stages are an indication of the severity of the cancer and also indicate the extent of the progression of the cancer. This classification is most commonly used for solid tumours that arise in an organ. The exact classification depends on the exact nature of the cancer.

Stage I cancer: this is confined to the organ where the cancer originated

Stage II and Stage III cancers: these indicate a more extensive area of organ involvement or the cancer has advanced from the point of origin to involve adjacent structures

Stage IV cancer: where the cancer has spread to a distant organ or structure in relation to the original tumour site

Credibility: used in a statistical context, credibility refers to the reliability of the analyses

The experience of dread disease products

Traditionally, when determining the price to charge and setting the premiums for tiered dread disease products, insurance companies have relied on the results of medical studies and the opinions of medical and underwriting experts. This approach was largely due to the absence of appropriate data relating to the various illnesses covered.

For example, if we consider determining the price to charge for covering the diagnosis of cancer, we would require knowledge of the total number of people we would expect to submit a claim for cancer from the entire insured population and we would further require data relating to the number of people that would claim for each of the four stages of cancer.

At Hannover Life Reassurance Africa Limited we have a long and deep knowledge of tiered dread disease products and believe that a benefit of our experience and analysis is that products will be priced with more confidence and result in more affordable premiums.

Our analysis specifically considers the pricing of cancer, but similar questions need to be answered and process needs to be followed for the other dread disease claim causes such as heart disease and stroke.

Analysis of the data

Our results are based on dread disease cancer claims that occurred during the three year period from 2006 to 2008. Certain claims were excluded from the study because they either

- relate to policies that do not offer tiered benefits,
- the sum assured of the claim is uncertain, or
- they are progressions of earlier claims (approximately 7% of the observed claims are subsequent claims).

There are in excess of 1,000 cancer claims used in the analysis of which approximately half relate to male and the other half to female lives.

Figure 1 shows the percentage of claims in each age group. The average age at which dread disease claims occurred is
at ages 49 for males and 45 for females. There are very few claims observed at ages above 70 (as there is very little available data at these ages) and therefore these results should ideally only be applied to ages between 20 and 69 years.

Details of the five most frequently occurring types of cancers for males and females observed in the data are shown in Figure 2. Skin cancer is the second most common type of cancer for both males and females, but the occurrence is significantly less than either breast cancer or prostate cancer.

Cancer stages

Females

Figure 3 shows that of the total claims observed in females, 45% are paid in respect of cancers that are diagnosed at Stage I (and lower). These results are obtained by mapping the corresponding payout percentages to the product definitions of the policies included in the analysis. This information can be used to price the Stage I (and lower) component of a tiered cancer benefit by using 45% of the known (total) cancer incidence rate.

Similar pricing calculations are performed based on the results relating to payments at other levels. As shown in Figure 3, 23% of the claims were paid for cancers at Stage II and approximately 32% relate to Stage III or Stage IV diagnoses.

These results are often different to those from the population cancer registries maintained by developed countries such as the SEER data from USA and the UK cancer statistics. As an example, if we consider only breast cancer the results from our insured portfolio show that about 73% of cancers are diagnosed at Stage I or II compared to 58% observed in lives below age 65 in the USA population. The results based on the insured portfolio should be a better reflection of the cancer incidence in the insured population of South Africa.
Males

The corresponding results for males are also shown in Figure 3 and they reflect a broad similarity to the results for females. Prostate cancer is the main cancer claim type and 38% of claims relate to payments for cancers in Stages III and IV. This most likely reflects the relative reluctance of males to seek medical attention at the outset when the early symptoms are present.

Conclusion

These results illustrate how the pricing of tiered dread disease benefits can now move away from the numerous theoretical assumptions. We are now in a position to more accurately reflect the emerging experience of the relevant insured portfolios and it is essential that this is done for the most common causes of dread disease claims in the insured population because it is more focused, accurate and appropriate.

The data for claims for the insured population in Africa is significantly smaller than those relating to populations of developed countries. Developing pricing information from smaller datasets gives rise to uncertainty in the results obtained. However, it is not feasible to ignore the emerging experience especially when pricing is required for countries with differing lifestyles and ranges of medical facilities and services available.

At Hannover Life Reassurance Africa Limited, we will continue to monitor the emergence of the experience and perform investigations to ensure that our partner life assurance companies have access to the most recent and relevant information.

References

1 http://seer.cancer.gov/faststats

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