Institute of Actuaries of India

Subject SA1 – Health and Care Insurance

November 2010 Examination

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable

Question 1

1.1 Solution:

- Income protection (while off work to compensate for lost earnings, provide assistance or meet specific regular outgoings)
- Compensation for healthcare costs
- Saving for future needs
- Capital needs due to unexpected events (sickness or accident) occurs
- Early retirement

1.2 Solution:

- Adapt the immediate environment to cope with changed physical needs
- Repay mortgage
- Supplement income over the short term
- Pay from medical expenses
- Continue retirement provisions
- Secure business stability
- Fund domestic help
- Finance holidays for recovery

1.3 Solution:

- Fixed benefit products.
- Short term disability products.
- Long term care products.
- Health Cash products like hospital daily cash.
- Major Medical Products.
- Reimbursement products.
- Covering inpatient, outpatient, and dental costs, supplementary to public health schemes or as standalone.

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Question 2

2.1 Solution:

In healthcare the Proposer does usually know more of the risk circumstances than the Insurer. The Insurer does also have the option of choice regarding whether or not to take the coverage and the level of coverage.

2.2 Solution:

The Insurer runs a risk of losing both existing client base and potential new business when its high premium increase is named and shamed in public. This may arise formally and legally through the courts, but also less formally through press comment and television exposure.

2.3 Solution:

Losing existing clients:

Lapses are generally anti-selective (e.g. the healthier risk is tending to lapse) which has negative impact on the performance of the remaining portfolio. Premium increase can lead to higher than expected lapses which would again contribute to a deterioration of performance. Furthermore, due to less renewal than expected the loadings for initial expenses may need to go up.

Losing potential new clients:

In case the Insurer cannot grow the new business as planned, the business mix fresh business/renewed business would change which may lead to a lower portfolio performance than expected.

2.4 Solution:

- Increase or introduce excess/deductible
- Introduce sublimit for certain benefits
- Renegotiate provider contracts
- Reduce costs related including those of third parties like TPA
- Introduce waiting periods
- Tighten claims underwriting
- Improve and tighten underwriting

2.5 Solution:

With increasing age the incident rates for hospitalization are increasing substantially as well as the average claims costs. This leads to an exponential increase of burning costs with growing age. In inpatient, the relation between burning costs age 35 and age 70 is usually at least 1:6 at least more common or even 1:10 or higher. The above premium table shows an age relation between age group 0-35 and 65-75 of only 3.2. This looks far below the usual age curve and gives reason to believe that the current premium table does include an element of subsidization from younger ages to older ages. The ageing of the portfolio would necessarily lead to significant deterioration of the performance which could partly explain the drastic increase of premiums by 40%.

Incident rates for an inpatient product should be roughly between 3%-12%**.** Of course, it depends strongly on average age assumption.

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Question 3

3.1 Solution:
Risks:

- Medical inflation is uncertain to predict even if historical data are available.
- Lack of control over the costs charged by medical providers.
- Changes in utilization due to medical progress:
  - daycare surgeries can now be conducted without overnight stay-in or outside the hospital,

   - hip replacement and heart attacks lead previously to death-can now be treated.
- Changes in utilization pattern due to new diseases (SARS, AIDS, Alzheimer, etc.).
- Changes in utilization pattern due to changes in legislation, public health coverage, and provider supervision (changes in retirement regulation can lead to higher utilization since sickness does allow to retire earlier by full compensation, etc.).
- Change in utilization due to anti-selective lapse.
- Increased underwriting (including pricing) risk.

3.2 Solution:

Due to the large risks and uncertainties described in 3.1 the premium loading for the guarantee and future medical inflation should be substantial. The price difference should at least reflect the expected medical inflation for the guaranteed term beyond the annual renewable policy, e.g. n-1 if n is the term of the premium guaranteed.

3.3 Solution:

Cheaper products do usually attract the healthier risk which could lead to anti-selective client (new clients and existing clients) behavior and less health population would be covered under the guaranteed product. This would lead to an even higher premium difference between guaranteed and annual renewable product.

3.4 Solution

a) The level premium calculation requires set up of an ageing reserve. This reserve is based on the assumptions made at the time risk premium is determined. At the time of premium revision a higher medical inflation for the future is determined which means that the currently set ageing reserve for existing business is not sufficient. Therefore, the reserve gap needs to be filled which is likely to be funded by the insured population, e.g., the expected premium increase for the insured population should be higher than 20%.

b) Reputational risks: In the case of an insurer needing to fund the reserve gap by premium increase only; it would, in consequence, mean a relatively higher increase compared to the increase of the premium table for new business. Furthermore, the more often an insured has renewed with the company the relatively higher the premium increase; since reserve gap is higher. This may be hard to explain to the consumer as well as to courts.

Alternatively, the insurer would need to fund the reserve gap which would certainly be unaffordable in the middle and long run since a gap in ageing reserve due to a 6-15% annual medical inflation has a dimension which cannot be funded.

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Question 4 (From SA1-02 page 25)

4.1 Solution:

Risks:

- Moral hazard typically relates to the claims behavior of individuals who undertake more potentially claim-inducing activities because they are insured.

4.2 Solution:

- When a person is covered by a medical policy such as Mediclaim they might be more inclined to put off treatments or preventive measures that they would pay for out of pocket and which are done on an outpatient basis and gamble that they may not need treatment at all or that when they become ill that treatment will be done on an inpatient basis.
- Because stays in the hospital are generally undesirable Moral Hazard under a Mediclaim policy would likely be somewhat less than you might expect in other types of Health Insurance, such as disability insurance or Hospital Cash.
- One might also see people applying for Mediclaim insurance and lying about their past medical history. This could also be considered a form of Moral Hazard.

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Question 5 (From SA1-03 page 8)

5.1 Solution:

a. The population that is purchasing health insurance is getting older.

b. This same population is living longer as a result of advances in medical science.

c. This same population is generally retiring younger.

d. They are having fewer kids.

5.2 Solution:

- The fact that the population is getting older, and people are retiring earlier means that there are less people paying taxes to support the entitlement of health insurance in the UK.
- The fact that people are having fewer kids compounds that problem as does the fact that medical science is able to extend life which further exacerbates the problem because those life extending technologies are expensive in and of themselves.

[6]

Question 6 (SA1-06, page 3 and page 23)

6.1 Solution:

- It can protect a company from anti-selection and in particular from lives whose health is so seriously impaired that they would have to be declined.
- The medical underwriting process will enable a company to identify lives with a substandard health risk for which special terms would need to be quoted.
- For substandard risks the medical underwriting process will identify the most suitable approach and level for the special terms to be offered.

- Adequate risk classification within the underwriting process will help to ensure that all risks are rated fairly.
- Medical underwriting helps to ensure that the actual experience for a block of business is not too far off from the assumed levels in pricing.
- For larger proposals the medical underwriting will help to reduce the risk from over insurance.

6.2 Solution:

- The underwriter will want to see what percentage of those eligible enroll at the time the group is established (the greater the percentage, the less the chance of anti-selection).
- A “free cover limit” may be set where a certain level of benefits is available to all members of a group without medical underwriting
- The enrollees to the program should be certified to be “actively at work”.
- Recognition should be given to claims in process from any prior coverage when a group transfers from one carrier to another.

6.3 Solution:

- Personal details such as age, gender, address.
- Also details regarding the financial circumstances of the individual to insure that the insurance requested is in line with the lifestyle of the individual.

6.4 Solution

- The type of product.
- Method of distribution.
- Target market. (socio-economic factors, age, financial sophistication)
- Range and size of benefits.
- Cost vs. benefit of underwriting.
  - feedback from customers
  - level of competition
  - approach taken by others in the marketplace
  - reinsurer’s views or requirements
  - regulatory constraints
  - impact of technological advances such as genetic testing

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Question 7 (SA1-08 page 2 and page 45)

7.1 Solution :

- When a policy is sold the company incurs significant expenses.
- Adequate reserves must be set up to satisfy regulatory requirements.
- The combined amount of initial expense and statutory reserves typically far exceeds the premium in hand on day one.

7.2 Solution:

- An appropriate model would be used.

- The model would incorporate the new business as well as any existing business.
- The assumptions used would encompass:
  - Model points
  - Lapses
  - Morbidity
  - Development
  - Scenarios would be run to determine the likely level of capital needed.
- Future volumes of the product must be incorporated into the full model office projection.
- Existing business would create capital as policies terminate without claims or simply generate profit during the year.
- Another source of supply is the existing supervisory free assets at the start of the period.

7.3 Solution:

- Capital is basically tied up in reserves that have to be held as assets.
- The assets have to be held until such time as the reserves are no longer needed; some time later in the policy term.
- The return on the money over the period is therefore pegged at a return that would be obtained from these assets; which will be less than the shareholders would expect from the use of this capital (i.e., the opportunity cost of holding the reserves).
- To compensate, premiums are increased to a level that will produce policy "profits"; that in total provide an adequate return on the capital provided by the shareholders.
- The greater the initial capital required, the higher the premiums have to be in order to compensate for increased opportunity cost.

7.4 Solution:

- Supervisory insolvency.

7.5 Solution:

- A product with poor morbidity produces losses,
- However these will not just be left to emerge as they happen,
- As soon as the likely level of losses is clear the company will set up adequate supervisory reserves to cover the expected future claims costs,
- Extra capital is therefore tied up in these (larger than expected) reserves.

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[Total Marks 100]

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