Institute of Actuaries of India

Subject SA1 – Health and Care Insurance

November 2011 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

Answer-1

(A)   Following could be some of the reasons for difference in claims under existing policy and the quote of premium submitted by XYZ for the next year:

i)   The claims are for 11 months as one month is still to go for the policy to be complete.

ii)   There will be some claims which are incurred but not reported as on that. Hence, insurer needs to account for the IBNR.

iii)   The no. of employees in the existing policy is 1125 while it is given that ABC Enterprises presently employs around 1200 people. Moreover, not only the no. of employees but the total demographic of all the lives covered including family members needs to be compared.

iv)   There will be some loading for medical inflation for next year to be provided in computation of premium.

v)   All the people covered under existing policy will be older by one year for policy renewal and this impact has to be considered while arriving at premium for next year.

vi)   XYZ insurer may not rely 100% on the performance of this policy to rate it. They may be having experience of other policies with similar benefits and may like to use the data available to them for entire portfolio which will be more credible because of bigger pool of lives insured. Moreover, where available insurer would like to use the multiyear experience not only the last year's data.

vii)   It is clear from the question that broker is involved and, hence, the insurer needs to charge for brokerage they paid to concerned broker.

viii)   Insurer needs to charge for various expenses, like claims handling, policy administration, other management expenses, etc.

ix)   There can be loading for re-insurance cost, cost of capital, catastrophic reserve, etc.

x)   Insurer needs to provide for its profit and contingency margin.

xi)   There is service tax in the premium that insurer needs to collect from customer and deposit. This further increases the total premium to be charged.

(B)   The following are the advantages of self-retention:

i)   Company may tailor made the benefits as per the requirements.

ii)   Company will be benefitted by favorable loss experience.

iii)   It will have better control on claims adjudication.

iv)   It can avoid payment of brokerage, expenses & profit of insurance company, tax on premium, etc.

The following are some disadvantages of this approach:

i)   There will be fluctuations in the claims experience from year to year and the budget provisions of last year's claims plus 10% may not be adequate to meet the claims outgo in some of the years

ii)   Company may not have in house expertise to design the policy benefits and, so, may not come up with the best policy design feature. They may think of taking services of outside expert but that will add to cost.

iii)   There may be spurt of claims because of sudden outburst of disease, etc. and company may not be protected against that. They may evaluate taking non-proportional cover with retention they are comfortable with and reasonably high limit but that means shelling out money in the form of premium.

iv)   The company may not have required expertise to handle claims. There is also danger of collusion by employees for payment claims fraudulently. In case of claims denial there the employee relationship may be jeopardized. Any attempt to outsource claims management will result in increase in cost.

v)   There can be tax implications for payment made by the employer to employees for reimbursement of inpatient and outpatient expenses for employees and their family members.

vi)   The administration of the policy in house may be more costly because of lack of economies of scale.

vii)   The company may not be able to deal with so many hospitals as insurance company can. This will result in restrictions in cashless facility. Also company may not be able to get the best rates from hospitals in the form of discounted tariff because of low volume as compared to insurance company.

To sum up, there seems to be some immediate savings in monetary terms if ABC Enterprises decides in favor of self-retention of Group Health Policy but in the long run the savings may vanish because of the extra costs which can be monetary or non-monetary.

(C)   The following is the list of changes in policy design that may result in reduction of premium:

i)   Coverage to only employees not their family members
ii)   Lowering the sum insured
iii)   Changing the individual sum insured to family floater
iv)   Introducing co-pay on claims (can be for employees or family members or both)
v)   Introducing a deductible on every claim
vi)   Removing outpatient cover completely or lowering the limit
vii)   Put disease specific restrictions on claims
viii)   Removing maternity from the benefit altogether or introducing waiting period for the same or decreasing the sum insured for maternity
ix)   Removing coverage of pre-existing diseases completely or introducing waiting period for the same
x)   Instead of tiered benefits that increases with the grade have only base cover for employees at all level
xi)   Restriction on room category insured can avail
xii)   Pre-authorisation of claims

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Answer-2

(A)   Solvency Ratio is the ratio between Available Solvency Margin (ASM) and Required Solvency Margin (RSM).

The calculation of Available Solvency Margin is given below:

Particulars		Insurer - A	Insurer - B
Policyholder's Fund:			
	- Available Assets	24,300	24,500
	- Liabilities	-19,400	-19,400
Excess in policyholder's fund (i):		4,900	5,100
Shareholder's Fund:			
	- Available Assets	17,200	15,700
	- Liabilities	-12,100	-11,200
Excess in shareholder's fund (ii):		5,100	4,500
Available Solvency Margin (ASM) (i) + (ii)		10,000	9,600

Thus, Available Solvency Margin (ASM) is arrived at by subtracting total liabilities from the total available assets (both on account of Shareholder's fund and Policyholder's fund).

For Required Solvency Margin higher of 20% of Net Written Premium and 30% of Net Incurred Claims is taken with the condition that benefit for reinsurance is restricted to 25% only. Following is the calculation of RSM:

Particulars	Insurer - A	Insurer - B
Gross Written Premium	36,400	34,700
75% of Gross Written Premium	27,300	26,025
Net Written Premium	32,800	22,000
Higher of 75% of GWP or NWP	32,800	26,025
Required Solvency Margin-1: 20% of above	6,560	5,205
Gross Incurred Claims	22,200	28,000
75% of Gross Incurred Claims	16,650	21,000
Net Incurred Claims	20,800	19,700
Higher of 75% of GIC or NIC	20,800	21,000
Required Solvency Margin-2: 30% of above	6,240	6,300

RSM-1 and RSM-2 are compared with the minimum limit prescribed by regulation. Solvency Ratio is derived by dividing ASM by RSM as given below:

Particulars	Insurer - A	Insurer - B
Required Solvency Margin-1	6,560	5,205
Required Solvency Margin-2	6,240	6,300
Minimum Required Solvency Margin	5,000	5,000
Required Solvency Margin: Highest of above 3	6,560	6,300
Available Solvency Margin (from table above)	10,000	9,600
Solvency Ratio (ASM/RSM)	1.52	1.52

Hence, Solvency Ratio is same for both the insurers at 1.52.

(B)   In case of Insurer-A, the Net Written Premium and Net Incurred Claims are higher than 75% of Gross Written Premium and 75% Gross Incurred Claims respectively. This means that Insurer can improve its solvency ratio by ceding more business to reinsurer. The same is not true for Insurer-B because it is already enjoying the maximum advantage of the reinsurance.

In case of Insurer-B, it is the criteria of Incurred Claims which has impact on the Required Solvency Margin while Written Premium takes a backseat; unlike Insurer-A where Written Premium decides the Required Solvency Margin. Hence, the Insurer-B should look into the kind of business it is writing by analyzing loss ratio, frequency, severity, etc. and try to improve the performance of the portfolio in terms of its profitability. The same can be achieved in a variety of ways; stringent underwriting, upwards price revision, altering the business mix, reducing moral hazard and frauds by close claims management, etc.

It should be noted that any improvement in terms of profitability of business will improve the solvency ratio in the long term. The better profitability will result in more retained earnings that will result in higher investment pool. The same is true for both the insurers. However, for Insurer-B the impact of writing more profitable business will be both direct (in the form of lower RSM) as well as indirect (in the form of higher ASM).

Apart from the above, there are a few measures that are applicable for both Insurers' A and B; for instance,

- Introduction of more capital by the shareholders.
- If there is some investment in unapproved securities, move the same to the approved securities.
- Review all the valuation of technical reserves and other liabilities in order to find if there is any excess amount lying there and rectify the same.
- If insurer is paying any dividend, its dividend payment policy needs to be looked into.
- Investment policy needs a closer look, although higher investment return has positive impact on solvency, insurer cannot take risk at this juncture when solvency ratio is marginally higher than minimum required. The investment should be made in assets of high ranking that match with liability profile more closely.
- Better expense management to put a curb on wasteful expenses.

[Credit to be given only if the points are explained well in the given context and are relevant to the given example]

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Answer-3

The relationship between various parameters can be explained by the following formulae:

$$Burning\ Cost\ per\ Capita = Incidence\ Rate \times Average\ Claim\ Size$$

$$Loss\ Ratio = \frac{Burning\ Cost\ Per\ Capita}{Premium\ per\ Life}$$

$$A = 20800 \times 4.3\% = 894.40$$

$$B = \frac{894.40}{1523.00} = 58.65\%$$

$$C = \frac{3060}{42500} = 7.20\%$$

$$D = \frac{3060}{55.9\%} = 5474.06$$

$$E = \frac{7886}{13.7\%} = 57197.08$$

$$F = \frac{7886}{73.80\%} = 10617.89$$

[6]

Answer-4

(A)   **Budget Policies**: These are cheaper policies with restricted cover. Examples of these are PMI policies with excesses (the insured bears the first tranche, a pre-specified fixed sum, of each claim), policies with copay (the insured bears the fixed proportion of each claim) and policies that provide inpatient cover only. The term can also apply to CI policies (restricted list of diseases covered) and IP policies (limited benefit period).

(B)   **Capitation:** This term relates to the practice of charging for cover by forecasting the likely claims on an individual basis and charging this, adjusted for expenses and profit, as the premium. In effect, the insurance company "carves out" a set of medical benefits (such as dental claims or mental health claims) and passes this risk onto the provider, by giving a proportion of the insurance premium for each person managed to the provider up-front rather than an amount per claim. The risk that funds are insufficient to cover treatment lies with the provider of the healthcare service.

(C)   **Free cover**: This term refers to a benefit level in a group risk arrangement, below which the member is not subject to individual underwriting. Free cover is usually a function of the number of members or the aggregate of benefits provided. Free cover limits are also known as "non-selection limits".

(D) **ICD:** ICD stands for International Classification of Diseases. It is a classification of diseases and surgical operations, by both coding and wording, in order to maintain an international standard. Using ICD, every health condition can be given a code and assigned to a unique category that includes a set of similar diseases. Most countries classify diseases using ICD-9 or ICD-10 codes.

[4]

Answer-5(a)

(A) Factor to annualize incurred claims taking into consideration that claims paid information is available up to 1.10.2011 and IBNR.

(B) Medical Inflation. Package fees are usually negotiated with providers but subject to renegotiation. This has to be considered.

(C) Increase in Utilization due to increased insurance awareness within the insured population and medical advance.

(D) Changes in utilization due to higher or lower network provider density.

(E) Increased claims costs due to ageing of the population.

(F) Increased utilization due to ageing.

(G) Changes in TPA and administration.

(H) Lapse/Enrollment impact.

Answer-5(b)

There are only 12 enrolled providers but 70,000 families. If we assume 4 family members on average we can expect 280,000 insured's lives having access to only 12 providers. It must be necessarily assumed that the increase of enrolled providers would have significant impact on loss experience.

Answer-5(c)

(A) Age distribution of insured's and claims

(B) Gender distribution of insured's and claims

(C) Family size distribution

(D) Claims distribution per provider

(E) Claims triangle on month basis

(F) Information related to the first year of the scheme (the scheme is due for the 2nd renewal)

Answer-5(d)

• Social/ Rural obligations
• Participate to observe this type of business and collect better intelligence

[26]

Answer-6(a)

(A) Major Epidemics or Pandemics

(B) War (if not excluded)

(C) Natural Disaster

Answer-6(b)

(A) Exclusion as per policy conditions if permissible. However, in practice Pandemic Events or Major Epidemics are difficult to exclude due to uncertainties in definitions and chaotic conditions during the time of the Pandemic event.

(B) Reinsurance. However, standalone non-proportional cat reinsurance coverage may be difficult to get from the market. Standard Solutions, like quota share reinsurance are also reducing the impact of such cat events.

(C) Cat Reserves built over time can protect the insurer to a certain extend – but do have rather reduced impact in the early stage of the reserve building phase.

Answer-6(c)

In India we can roughly assume an incident rate of 6%. Due to a Pandemic Event as described the incident rates would go up to 8.5% (e.g., an increase of 41.6%). If we assume the claim size for treatment of the pandemic disease would be same as average claim size, the loss ratio would increase from 80% to 80%*1,416=113.3%.

Relevant for the answer is the description of the methodology.

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Answer-7(a)

- Risk adequate premiums for high age groups need to be very high. Very high premiums mainly attract unhealthy risk – but not health risk. Hence,
  - pricing error is high,
  - sustainability of the premiums maybe short,
  - High premiums are causing increased reputational risk.
- Exclusion for pre-existing conditions in the first years would be problematic for elderly insured's – which leads to increased reputational risk.
- Underwriting approach will be problematic since exclusions of pre-existing conditions could make the coverage meaningless and premium loadings would further increase the high premiums and further increase the risk of anti-selection as described above.
- Ageing of the portfolio is accelerated. Since medical inflation is higher for higher ages – this goes along with faster premium adjustment cycles and reputational risk. Hence, it would be good to learn more about the targeted volume of business and nature of business; fresh business, portable business, etc.
- Pricing basis may be less secured due to lack of data.

Answer-7(b)

- The portfolio is ageing more rapidly, e.g. the average age of the portfolio will increase faster – consequences are explained under Answer 7(a).
- Premium may become unaffordable in very high age groups. It may be required to subsidize such risk in future, which could make it necessary to increase premiums for younger age groups.
- The Insurance benefit with an annual limit amount of Rs. X" may not be sufficient to cover the health risk for the whole life.

Answer-7(c)

- Delayed enrollment process could increase anti-selection drastically (e.g., parents may decide to insure the child in case they learn about health problems at the time of delivery or even before).
- Newborn babies do have very high burning costs in the first year (e.g., risk rate for children age group may need to be increased).
- Risk with congenital defects may get accepted due to such a rule. This can have a long-term effect on the portfolio since such risks may be not "portable" and hence, such risk is accumulated in the insured portfolio over time.

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