Institute of Actuaries of India

Subject SA1 – Health and Care Insurance

September 2017 Examination

INDICATIVE SOLUTION

Solution 1:

i) Factors to consider before adopting bundled payment arrangement

- The cost is fixed for some part of insurance claims. So, this increases the predictability in terms of severity and thus could potentially reduce the claims volatility
- However, the insurer is still exposed to the risk of higher utilization due to the provider splitting up the claims and/or encourage re-admissions
- The fixed cost arrangement could lead to more competitive pricing especially this being first such arrangement in the market. So, this could result in higher sales for the insurer.
- On the other hand, this could lead to limited choice for the policyholders as you would expect them to go to only the provider with whom the insurer has the arrangement. Depending upon the network of the provider, this may impact sales
- The bundled payment concept may not be applicable on all procedures- in which case, there could be some other procedures – for which the dental provider might be charging higher costs. So, It is important to assess the overall cost with or without the arrangement to determine the attractiveness of the arrangement
- If the provider is used for non-dental services in other health insurance products offered by the insurer, it is important to check that the provider is not offering attractive terms on Dental in return for higher pricing on other services. So, the implications for other products of the insurer need to be considered as well.
- The provider may require a minimum number of members to be enrolled and the risk and cost implications of not being able to meet that requirement will need to be considered
- Quality of service may be impaired leading disgruntled customers– for instance, screenings may be restricted to the most basic tests.
- Reputation risk is present if the provider defaults on its commitment. This happens when the provider took an aggressive pricing approach and finding it difficult to fulfill the promise. So, the payment mechanism and alternative options in the event of default will need to be considered
- This risk is exacerbated if the insurer is selling long term medical insurance plans with dental plan rider
- Administrative system implications need to be considered – for example, will the system cope with different treatment for claims from different providers – one with fixed cost and others on actual
- Regulatory implications of such arrangement will need to consider. For example, the regulator may not be happy with the arrangement as it can be seen as transfer of some of the insurance risk to the providers. Solvency capital requirement may increase to reflect the default risk and other service issues.
- Overall, it is important for the insurer to assess properly the exact underlying cost of the services included under the bundled payment arrangement using either a marked to model or mark to market approach.

[9]

ii) Full capitation model

Advantages

- Less risks for the insurer as both utilization and severity risks are borne by the provider
- This might result in lower capital requirement for the insurer
- First mover advantage - the insurer can thus be more competitive than the competition leading to higher sales
- Claim administration more simple
- Likely work well for low cost mass products where the utilization and severity are more predicable

Disadvantages

- Quality of service may be compromised leading to reputation risk for the insurer
- Possible disruption of service if the provider defaults half-way
- In the event of provider default, insurer may have to find alternative arrangement and it can prove to be costly
- Provision of capital for the default risk might outweigh the capital reduction for no/low risk
- Policyholders may not get tax benefits on the premium paid to such products – since it is the provider who bears the insurance risk

[6]

iii) Payment based on Quality

- The system incentivizes the service providers to offer higher quality of service and therefore it should improve the policyholder satisfaction
- The key challenge is to define quality – putting in place a meaningful measurable quality metrics
- There is no gold standard when it comes to quality metrics - Quality standards in health care are not well defined across the major economies and therefore, there is scope for a wide variation across countries
- There is the risk that the standard metrics will be set too low in which case, the claim payments could be much higher than needed
- If the standard metrics are set too high, payments to providers will turn out unsustainably low for the providers
- However, there is a high risk that providers will lobby or renegotiate to bring the payments at a higher level- in which case, a lot of time and resources will be spent on agency costs
- For an effective design mechanism to be set around the 'payment by quality' standards, significant data analysis will be needed – for instance, to assess the key metrics that will be used to measure quality
- Examples of hospital quality will be: infant mortality, satisfaction survey, time spent before consultation, delivery of service, re-admission ratio

- Need to ensure that quality of standards are not being promoted at the expense of essential medical services. For instance, accessibility may be one issue that is compromised or patients may be referred to other hospitals
- It is important for the insurer to assess whether this system will be applicable across all providers or certain providers only
- Reactions from Competition and Regulator will also influence the decision making

[6]

iv) Chronic Disease Management (CDM) program

- The CDM comes in different forms and so the specifics will need to be well understood in order to determine the cost implications
- There will be outgo in terms of expenses of implementing and managing the program.
- This will involve investing in technology and tying up with providers of chronic disease management
- A good starting point would be to examine the cost and time that it took to implementation of such a program by any other insurer locally or overseas. Consultants or reinsurers who promote such programs will likely have an idea of the cost.
- Any overseas costs will need to be adjusted for local costing as well as trending for expense inflation. Local cost projections will have to allow for inflation as well.
- There will be saving via lower claims from complications of chronic illness
- Data analytics to determine
    - Burning costs split by different types/stages of chronic illnesses – e.g. Diabetes, hypertension etc.
    - Burning costs further broken down to utilization and severity
    - Medical trend for chronic vs non-chronic diseases
    - Business mix in terms age/CD profile in the past and expected future mix

- The expected reduction in utilization coupled with estimated severity of such claims from CD complications will give a sense of the cost savings
- Important to factor in that the benefits of these programs may be felt only in the medium to long term and also it depends very much upon the program effectiveness and adherence

- Benchmark the calculated savings against industry studies/surveys/medical research

[6]

v) Reasons for under reserving

- Use of assumptions that do not comply with prescribed – regulatory or actuarial practice standard
- Use of assumptions not backed by sound analysis of companies past experience
- Datasets used for the reserving exercise were not complete or a certain chunk of business may have been omitted from the analysis
- Use of approximations in terms of reserving methodology were not appropriate

- Any options or long term guarantees were not valued
- Error in modelling - deterministic or stochastic modelling
- There could have been administrative platform changes which led to some data not being properly captured
- Change of personnel that have led to data or calculation errors
- A recent regulatory change required drill down (e.g. by territory, by product limits, by distribution etc.) but high level approximations used due to data limitations
- IBNR reserve set based on past experience without allowing for changes to the product/distribution/claim processing dynamics
- Failed to take account of any recent court rulings that will impact of the claim liability (e.g. delayed claims will need to paid with penal interest; claim contestability period reduced etc.)
- Internal pressure by management to produce a lower reserving figure to avoid having to raise extra capital or to meet certain level of profitability
- Product involved risks that were not properly understood and modelled or priced for
- There was no back testing exercise carried out to ensure that the results made sense
- Nor any comparison against previous reports or benchmarks to assess adequacy
- There could have been a change in methodology in estimating the technical provisions which led to a reduction in the reserving.

[6]

vi) Process of checking adequacy of reserves

Set out the main components of the technical provisions- for instance

1. Incurred but not reported (IBNR)
2. Incurred but not enough reported (IBNER)
3. Outstanding claims reserves
4. Unexpired risk reserve
5. Unearned Premium reserve
6. Catastrophe reserve

Data adequacy

- The first step is to use the datasets that were employed for last year's reserving exercise and assess its adequacy and appropriateness
- In particular, check whether the information used was fully reconciling with the company membership and claims datasets and with finance files that would give an appropriate view on the company
- Could use the previous year's report data and cross check this with any movements in membership and claims inflow and outflows, also taking into consideration the premiums that were written over past years

Statutory implications

- Consider the statutory rules governing the key assumptions for valuation. In particular, check whether the assumptions used during the previous exercise were in compliance with the statutory requirements and applicable actuarial standards

- Examine at least the last 2 years valuation reports and then focus on the assumptions used and assess whether any deviation was justified or not
- In particular, Check the following key assumptions
    a. Interest rates for any long term products (e.g. Critical illness, LTC, Income protection product)
    b. Withdrawal assumption
    c. Utilization report and trends
    d. Severity report and trends
    e. Any change in the medical landscape in the market in relation to
    - How the providers set their tariffs?
    - Discount structure used for claim settlement
    - How the insurer negotiated with the providers for claim settlements
    - Any change in the claim adjudication rules which led to less claims being declined

Previous reports

- At a high level, assess the adequacy of reserves through a movement analysis between the previous independent actuarial reports and last year report
- Validate the assumptions that were used based on these independent reports
- Consider any feedback from the regulators or peer review reports to check if the issues raised were addressed adequately

Financial statements and benchmarks

- Use audited financial statements to do a high level reasonableness check on the adequacy of the reserving
- Also, compare against the industry benchmarks and ratio analysis (for instance, ratio of claims to premiums and ultimate claims by treatment months) for a more meaningful assessment

Incurred but not reported (IBNR)

- Aggregate the past data by treatment date and reported date
- If reported date not available, use settled date
- In this case, we are estimating the Incurred but not settled claims (IBNS)
- Run off triangle over past 3 years of claims and derive the development factors
- Assess the development factor in the last 2 or 3 months of treatment date as the ultimate claims are very sensitive to these figures
- It could be that the last year's report had some manual changes in the last 2 or 3 months of development factors- which led to under-reserving
- Assess a sensitivity on the reserving based on using the last 12 months development factors or last 24 months etc.
- Assess the IBNR approach through a different methodology- for instance, Bornhuetter Ferguson or Claims ratio approach
- Do a back testing to ensure that the reserves are adequate or not

- If statutorily imposed, the actuary should rely on the method prescribed by regulations for his estimates

Incurred but enough reported (IBNER)

- Sometimes, the systems will capture only claims reported to insurer. However, there may be significant claims which have been medically pre-authorized.
- Ask for such extra claims reported which may not be captured within their system and then, form an opinion on the IBNER reserves (if any)

Outstanding claim reserves

- Assess whether the appropriate levels of outstanding claims have been used
- This could be assessed by using a claim ratio of outstanding claims to settled claims over the appropriate month of duration and compare against what has been used for last year's valuation exercise
- The actuary should also assess whether there have been any change in the claims administration platform – for instance, Third Party Administrator or change in the number of claim personnel or any divestment that may have caused a reduction in claims reported but not settled
- The actuary should also investigate any special case reserve that may have been omitted

Unexpired Risk Reserves

- Compare the prior years' provisioning vs actuals and try to explain any material deviation

- It could be that the forecast performance of the portfolio were done too aggressively – in which case, the possibility of premium deficiency would have been low. Carry out premium deficiency test stochastically taking into account the business mix and the external environment that could affect claims both from amount and timing perspective

Unearned Premium Reserves

- Likely to have an impact if there have been a change in methodology- say from 1/24th approach to 1/365th approach. However, this is unlikely to make a material difference
- Need to ensure that premium used is net of commission etc.

Catastrophe reserve models

- Investigate whether there have been claims relating to catastrophe that were accounted for in the previous years but not during last year valuation exercise.
- The catastrophe modelling exercise is likely to spread the likelihood of claims occurring in a particular year and then, spreading this over the remaining of a period of 5 years.
- Consider stochastic modelling as opposed any deterministic approach
- Examine the relevance of the catastrophe models in last year's business exposure context and assess whether it made sense to add or ignore those.

Expenses assumptions

- Investigate the allowance and allocation of expenses and assess whether these were based on sound analysis of the past experience
- In particular, consider expenses from relevant sources – say, financial statements and then, apply ratio analysis to estimate what would have been the expenses – based on the gross written premiums and claims incurred reported last year
- The expenses may be further classified into allocated and unallocated loss adjustment expenses or may classify the expenses into initial, renewal and termination expenses if relevant
- Based on previous ratios of expenses to claims and expenses to gross written premiums, estimate the expenses that may have been relevant last year and then, form an opinion on the adequacy of the expense reserves

[21]

vii)

a) *If you agree with the consultant report*

- Estimate the amount of deficiency in reserving and present it to the management or board
- Outline the key reasons for the deficiency and also, the data, methodology, approach and results obtained
- Set out specific actions that the insurer should undertake in order to fix the deficiencies that led to under reserving
- Outline the possible implications on the following front: reserving, regulatory capital and required capital
- Present a revised version of the statutory reports to be sent to the regulator (with approval of the management)
- Work out the possible implications on the financial statements (if any)
- Maintain a high level of ethics and professional conduct – in that the analysis should be unbiased, objective and you should not get into a 'blame game'

[3]

b) *If you do not agree with the consultant report*

- Let the management know that you differ from the consultant's view on the reserving and that you are going to discuss with the consultant
- Schedule an appointment with the consultant to explain and understand each other's point of view
- In particular, you should focus on:
    - Data
    - Methodology
    - Calculations

  - Results
  - Sensitivity analysis
  - Sensible back testing
- Based on the discussions, consider if you would need to change any of your views
- Do follow up discussions with the Consultant if appropriate
- Seek advice from a third party – e.g. a senior actuary or your actuarial professional body
- Communicate the outcome of your discussions back to the management of the insurer
- You should communicate without condescendence your results and maintain the highest standards of integrity, honesty and professionalism all throughout

[3]

[60 Marks]

Solution 2:

i)

The overarching objective of the any regulation is to ensure that it continues to protect the interest of policyholders. The new expense regulation, which will supersede rule 17E of the Insurance Act, is aimed to limit the expense of management that a General or Health insurer is allowed to spend in a given financial year. The regulation specifies the overall limit (as % of premium for different lines of business / products) on expenses.

The new regulation also allows for more flexibility than the previous one and gives more authority to the regulator to deal with individual insurer's circumstances. The regulator under certain circumstances may allow higher expenditure than that is allowed by the regulation.

The regulator has also got the power to penalize the insurer if it fails to comply with the regulation.

In essence the new regulation is aimed to ensure that the policy holders are charged fairly.

[3]

ii)

Regulation 3 states that no insurer carrying on General Insurance Business or Health Insurance Business in India, shall spend in any financial year as expenses of management, an amount exceeding -

(i) The amount of commission or other remuneration paid to insurance agents and insurance intermediaries in respect of their business transacted in the financial year as may be allowed by the Authority from time to time;
Provided that the Authority, based upon the representation received from an insurer, may allow higher remuneration to the insurance agents and insurance intermediaries with such conditions as it may be deemed fit.
(ii) Commission and expenses reimbursed on reinsurance inward; and
(iii) Operating expenses.
Provided that the sum of (i), (ii) and (iii) above shall not exceed an amount computed on the basis of percentages appropriate to the various parts of its total gross premium written in India during the year in respect of various segments of business.

Schedule I specifies the percentages that vary by lines of businesses

For example, for the Health Retail business, the percentages allowed are 37.50% of the first 400 cr of the gross premium written in India. For the balance gross premium, the percentages allowed is 32.5%

The regulation allows for a higher expense limit if the insurer has presence (branch office) outside India
The insurers are required to have a well-documented Policy for allocation and apportionment of expenses of management amongst various business segments. The Policy shall be approved by the Board of Directors of the company and the same shall be available for inspection by the Authority.

It also specifies powers that are conferred in the authority to exempt and take action in case for non-compliance.

[5]

iii)

First dollar quota share would allow the insurer to receive ceding commission that would help in funding the capital strain.
For a health / general insurer, a large proportion of the capital strain is due to acquisition expenses. Hence, ceding commission from the reinsurer would help in offsetting the actual expenses incurred.

However, the expense regulation doesn't allow credit for reinsurance. This means that even if insurer were to opt for a first dollar quota share, it wouldn't help in reducing the expenses for the purpose of complying with the regulation.

[3]

iv)

If an insurer has in-house claims management then it is eligible for a higher expense allowance. The regulation states that fees paid to Third Party Administrators shall form part of claims cost. Where the TPA services are in-house, an expense of not exceeding 3 percent of the premium may be charged to the claims cost.

As the decision to move the claim management services in-house during the financial year, the expense allowance may be allowed proportionately.

[2]

v) a)

Under regulation 11 of the said regulation, the Authority based upon a representation received from a newly registered insurer, in accordance with the provisions of the Act, may exercise forbearance for a period not exceeding five years.

However, if an insurer fails to comply with these regulations even after the period of five years, the Authority, having regard to the business model of the insurer, may direct an existing Insurer to charge the expenses above the allowable limit to the Shareholders' Account.

Provided that no such direction shall be issued by the Authority unless a representation detailing the business plan and time period required for compliance with the Regulations has been furnished to the Authority in accordance with the applicable provisions of the Act.

The Insurers shall ensure that its expenses of management are within the allowable limit on the segmental basis as indicated in Schedule I to these Regulations

The Insurers shall ensure that their expenses of management are within the allowable limit on segmental basis. Where the company has violated the limits of expenses of management for one or more segments but is compliant on an overall basis, the excess of such expenses shall be borne by the Shareholders

[3]

v) b) As per regulation 14 of the (Expenses of Management of Insurers transacting General or Health Insurance business) Regulations, 2016**,** any violation of the limits on overall basis or the directions issued by the Authority in this regard may entail one or more of the following actions:

1. Excess to be charged to Shareholders' Account;
2. Restriction on performance incentive to Managing Director (MD) / Chief Executive Director (CEO) / Whole-Time Directors (WTD)and Key Management Persons (KMPs);
3. Restriction on opening of new places of business;
4. Graded Penal action under section 102 of the Act;
5. Removal of Managerial Personnel and / or appointment of Administrator;
6. Any other action as specified in the Act.

The Authority, apart from taking action as enumerated above, may also direct the insurer to not underwrite new business in one or more segments in case of persistent violation of these Regulations. Notwithstanding such directions, the insurer shall continue to service the existing policyholders in such segments.

[4]

vi) a) Main purpose of expense analysis for a health insurer

- It provides information to allocate expenses between different classes and rating groups.
- It estimates the sizes of the different elements of expenses for use in premium rating.
- It assists with financial planning
- It helps in establishing the reasons for actual vs. expected expenses.
- It may be required for regulatory reporting

[3]

vi) b) Non-commission expenses

- Initial - The initial expense could either be fixed, related to premium or SA. E.g. underwriting expenses, policy kit, sales and marketing expenses
- Renewal – the renewal expenses again could be fixed, premium or SA related. E.g. third party administrator expenses etc
- Termination – Expenses incurred at the termination of the policy contract.
- Claims and – expenses related to claims adjudication and claim settlement

- Investment – expenses related to investment of premium / reserves and / or managing the fund

[2]

vi) c) Process of Expense Analysis

The expenses of health and care insurance contracts are higher than for most other insurance products as there is usually more administration, more claims management / control and more detailed medical underwriting.

It is, therefore, very important for a health insurer to maintain a tight control on expenses. Else it may lead to leakages that could potentially have a negative impact on profitability.

Expenses are a particularly important consideration for the short term contracts e.g. PMI. The short-term nature of these contracts means that it is important to ensure that the overheads can be covered by the volume of business in force. Further, the possibility of low persistency / renewals makes it even more important to ensure that premiums are sufficient to cover the expenses.

The insurer needs to monitor the actual expenses incurred against the expected level on a periodic interval. This could be undertaken on the portfolio either on a monthly basis or quarterly basis. It is preferable to monitor expenses on a monthly basis.

Having said that, more detailed investigations for others elements of the portfolio should be undertaken from time to time, coinciding with the accounting reporting timings. These detailed investigations will include:

- expenses allocation between fixed and variable;
- Product contributions against expenses incurred.

It is advisable to collect expense information split between fixed and variable.
The non-commission related expenses should also be sub-divided between initial, renewal, claim, termination and investment

The relationship between the expenses incurred and the contributions to expenses from within each product should be examined on a regular basis. The results need to be incorporated into the pricing and reserving bases of the products.

Expense Inflation
Due allowance must be built into various health and care insurance contracts for the effect of inflation on expenses. Particular attention needs to be made to ensure that the expenses of paying and monitoring claims are adequate in future years.

For PMI contracts written on a one-year basis, it is possible to adjust for expense inflation at each renewal. For longer-term contracts, for example CI, allowances for future expense inflation will be included in the assumptions used when calculating the premium rates.

In order to have the right allowances within premium and reserve estimates, analysis has to be performed on the existing book to determine the precise impact of inflation and obtain estimates for future calculations. This will include an assessment of the extent to which the various expense

components are price-inflation or earnings-inflation sensitive. The analysis of experience here will indicate also the degree to which increasing costs are mirrored by national indices (*e.g.* RPI or average earnings) or whether these have to be adjusted.

Other expenses
Some items of expense outgo (*e.g.* IT expenditure) may be worthy of separate analysis. It is possible to consider spreading the allowance over a number of years for significant individual expenditures, such as company acquisition or installation of new IT systems.

The issues involved are complex; the effect on profit reporting, capital requirements and tax must be considered by the insurer as and when they arise. The difficulty can be that the period over which these expenditures have an effect may be shorter than the period used for tax and accounting purposes. The insurer will be keen to recapture these costs as soon as possible; however price competition may mean that large costs have to be amortized over several years' new business

[7]

vi) d) Probable causes of high Fixed overhead expenses

A fixed cost is an operating expense of a business that cannot be avoided regardless of the level of policies sold. Fixed costs are usually used in breakeven analysis to determine pricing and the expected business volume and sales under which a company generates neither profit nor loss. Fixed costs and variable costs form the total cost structure of a company, which plays a crucial role in ensuring its profitability.
It is well known that fixed costs per policies decrease with increases in sales. Thus, a company can achieve economies of scale when it sells enough policies to spread the same amount of fixed costs over a larger number of policies sold. Hence a high fixed cost may not be an issue if the insurer can achieve higher sales that will reduce the fixed cost per policy.

Companies with large fixed costs and unchanged variable costs in their business plan tend to have the greatest amount of operating leverage. This means that after a company achieves the breakeven point, all else equal any further increases in sale will produce higher profits in proportion to sales increase for a company up to a point where fixed costs per policy sold become negligible.

Conversely, decreases in sales volume can produce disproportionately higher declines in profits.

1. Poor business planning and implementation: The insurer has been in existence for over 7 years now. If the fixed expenses are high, it could be due to poor corporate decisions and / or execution. The management may have been very aggressive in their sales projections and created fixed expenses in expectation of increasing sales. The sales may not have increased in the same proportion as expected leading to high fixed cost per unit of policy sold. A detailed business analysis is required to understand whether the business planning was done taking into account all relevant facts and future business projection was realistic

2. Process and people inefficiency: The insurer may have also have inefficient systems, processes and people which are not productive. Hence, amount of fixed cost spent continues to be high

3. Regulatory changes: Frequent changes in regulation adversely impact insurer's business. It creates uncertainty in business planning and affects business decision making. E.g. A change in product regulations required all insurers to revise their product design and pricing. This lead to delay in product launch while the infrastructure may have already been there. In addition, it increases the cost of regulatory compliance mainly in terms of human resources.

4. Change in macroeconomic environment directly impacts insurer's business. This could lead to a lower business volume and a disproportionately higher fixed cost

5. Change in political environment: Political stability is crucial for stable business environment. It provides clarity to the business which aids in decision making especially strategic decisions like business expansion etc. Frequent changes in political uncertainly could have impacted insurer's business.

6. Government actions: Governments policies and decisions impact overall business and economic environments. E.g. change in tax rates, allowance of insurance premium as deduction, universal health insurance, and mandatory KYC requirements. While some of the decision will impact sales other decisions could impact expenses.

Possible solutions

1. Review business planning and projections
   The first step will be to understand whether the fixed expenses are high or Sales volumes are lower than expected. If it's the latter then whether it is temporary. The business planning exercise and sales projections should be redone on the basis of all information available to the insurer. At the same time, the fixed expenses needs to be analyzed to understand the nature and purpose of such expenses and whether it fits into the revised business plans and projection

2. Improve efficiency and productivity
   A full process review can be undertaken to understand if there are inefficiencies in the processes and systems. An understanding of the best practices adopted by other successful insurers in the market will enable the insurer to adopt such practices. A cost benefit analysis could also be undertaken to establish whether some of the process can be outsourced.

3. Skilled Resources: Usually the Salary cost are one of the highest components of the fixed cost. And if resources are either ill-equipped, less skilled or less motivated then it could have strong impact on the productivity and hence cost. Hence, it's important to establish whether employees have the right skills to do their jobs and whether they are motivated to perform those jobs efficiently.

4. Inefficient or Old systems or technologies: the insurer should undertake a comprehensive review of the systems and technologies that it uses and whether it can be upgraded.

5. The insurer may also want to check whether the fixed cost have been priced for in the premiums. [8]

[40 Marks]

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