

# **EXAMINERS' REPORT**

*June 2015 examinations*

## **Subject F101 — Health & Care Fellowship Principles**

### **INTRODUCTION**

The attached report has been prepared by the subject's Principal Examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners, and should not be taken as model solutions

## Question 1 (8 marks)

*Examiner comments: Students performed reasonably in this question.*

*Part (i), students often failed to relate their answers back to the information provided in the question. Instead, they provided generic answers (e.g. consider nature, term and currency of liabilities) where the solution was looking for more specifics of the product.*

*In part (ii), the concepts of longevity and payments not keeping up with inflation were the most important points that should have been raised. Students who identified these performed well, but again these were often overlooked by candidates.*

(i) 4 marks

Liabilities relate to annuities in payment

Annuity payments indexed to inflation

Also expenses of paying annuities

No future inflows as single premium policy

Established book of business likely to have average term of around 10 years

Fixed interest bonds offer security but do not match escalation

Index linked bonds are best match for liabilities

Equity and property investment appropriate for real returns

International assets not nec as local currency denominated liabilities

Legislation and regulatory requirements, such as permissible assets, maximum allowable investments in certain asset classes etc.

(ii) 4 marks

Main problem with fixed income security is the absence of insurance if someone were to take this advice.

An annuity may be thought of as insurance against the financial consequences of living too long (i.e. beyond the point at which your money runs out).

Without an annuity, the individual is taking the risk of living too long (longevity risk) himself or herself.

Someone needing long-term care will not be in a position to supplement their income when their savings run out.

But fixed income security option may mean money left over to leave for dependents

Also don't have to pay insurance margin and expenses and profit loading to the insurer

Running out of money may mean that you have to change your lifestyle (e.g. move to a cheaper care home) at a time when you are least able to adapt to change.

Other points that might be mentioned:

- The expenses of buying fixed-interest investments directly may be higher for the individual.
- The individual might not know which the best securities are to buy.
- The contract might not be backed entirely with fixed-interest securities. For example, if the company has sufficient investment freedom to invest a proportion of the funds in equities, index-linked gilts or corporate bonds, it may be able to offer better rates to policyholders.
- The insurer may be able to provide advice on how to get the best value for money, e.g. which providers offer better quality care or better rates.

## Question 2 (12 marks)

*Examiner comments: Students performed fairly in this question.*

*Some students went straight into suggesting a tiered benefit structure due to less severe conditions, even though the question stated that this product already offered cover on less severe conditions and cover was at 100%.*

*The examiner looked for comprehension of main concerns, in particular the inclusion of conditions without standard definitions, some students did not comment on this at all. Overall, students who performed better covered a wide range of points, tailored to the question.*

### **Interests and needs of customers**

Might increase lapse and re-entry rates if existing policyholders deem new additions as more favourable. ✓ This will depend on the price of the new product and additional underwriting requirements. ✓

Might result in a windfall benefit if less severe conditions do not really result in additional costs/ life-style changes. ✓

Without standardized definitions, claims may be more subjective. This may lead to the insurer paying out for claims it did not intend to. This could be due to:

- legal judgements against the insurer ✓
- avoid reputational damages by not paying out a claim when someone is in need ✓

### **Marketability**

Might increase the attractiveness and marketability of the product if the additions are seen as market distinctive. ✓ If the additions result in the price being more expensive this might reduce the attractiveness of the product. ✓

The product already covers core cancer conditions. The inclusion of less severe cancers may not have a large impact on policyholders/brokers. i.e. Unless a particular condition has recently been publicized ✓

### **Data**

They might need to obtain data from an external source in order to price the new additions (for example reinsurers ✓, however reinsurers will also expect to make some profit and thus reduce the overall margin available to the insurer. ✓ The new addition might turn out to have worse experience than anticipated, reducing the overall profitability. ✓

Alternatively, could use population data and adjust it to be applicable to the insured population using the insurer's own relative experience for other cancers. ✓

**Underwriting and claims** procedures will need to be considered (*expand beyond this for marks*), might require additional underwriting to current system in order to limit potential additional anti-selection ✓ due to benefits that are easier to claim on. ✓ Claims managers will need to be up to date with the definitions used and apply these as was anticipated at product design stage. ✓

Definitions needs to be clear and unambiguous√, the conditions added must be serious enough to add value yet not so common as to be too expensive to add.

### **Profitability**

Sufficient capital would be required to manage the sensitivity in profitability of this product. √ As the conditions added aren't expected to increase the rate considerably, this is not expected to be significant. √

### **Expenses vs charges**

Expenses in developing the new product, this will need to be passed on to customers, might make the product more expensive/ less attractive. √

### **Competition**

The success of the additions will depend on what is offered by competition (*with valid expansion*), likely a new addition making the product less comparable and less price sensitive. √

If this is reactive to what is already in the market, this may not have much impact on volumes except to decrease lapses where policyholders are moving over to the competitor. √

### **Administration**

Systems need to be able to Allow for new conditions. √

Need to train brokers on these new additions (*mark was also awarded if other valid comment about impact on brokers/ distribution channel made*). √

Financing requirements might increase, if large volume of sales results in new business strain. √

Regulatory requirements need to be taken into account. √ (*half a mark awarded for either regulatory or tax impact mentioned*)

Reinsurance expertise obtained, for example UW or Claims, or to reduce risk via quota share or other arrangement. √

[Max 12, √ = 0.5]

### Question 3 (14 marks)

*Examiner comments: Students seemed to confuse parts (i) and (ii) of the questions and answered part (i) in (ii) and vice versa.*

*In general part (i) and (ii) were answered fairly poorly*

*Part (iii) was answered well with many of the students scoring highly. Many students thought reinsurance was an appropriate technique to manage costs - few seemed to understand that it will smooth results but won't actually save money.*

- (i) Describe the risks to individuals associated with the proposed benefit structure. (4)
  - Sufficient private providers per discipline
  - May differ by region
  - Willingness of service providers to contract with the state
  - Quality of care provided
  - Need to fund 10% of each service received
  - Will not know cost in advance
  - More of an issue for lower income earners
  - May be unaffordable for large cases leading to services foregone
  - Also accumulation of debt
  
- (ii) Discuss the merits of the proposed funding basis for ActHealth. (4)
  - tax easy to collect
  - equitable as proportion of income tax
  - income tax progressive so implicit cross subsidy from high earners to low earners
  - extent depends on distribution of population by income band
  - very low earners won't pay
  - high earners may want to opt out
  - need to consider adequacy for costs under different scenarios
  - consider macro-economic implications of tax burden.
  
- (iii) Describe what additional measures ActHealth could put in place to manage the costs. (6)
  - Eligibility – means testing would exclude higher income earners and affect funding. Could provide alternative low cost benefits to low income earners.
  - Contracting – fee schedule for private health providers to limit costs and amount of co-payments
  - Benefit structure – limits to manage fee for service exposure
  - Managed care – pre-authorisation for large claims and case management
  - Monitoring and evaluation – track adverse utilisation trends also detect fraud and abuse
  - Covered services – economic and clinical evaluation of covered services.
  - Education – encourage preventive healthcare practices

#### Question 4 (14 marks)

##### *Examiner comments*

*Most students were able to discuss the pricing process, and some of the stronger candidates discussed the issues relating to Excess of Loss. Students tended to provide generic points related to reinsurance rather than specifically applying themselves to the catastrophe excess of loss nature of the question.*

(i)

1. Volatility of claims with heterogeneous risks (need for Cat XL?) ✓
2. Significance of extreme claims on financials ✓
3. Free assets available to absorb volatility, and the cost of such capital ✓
4. Availability of XoL reinsurance in the market ✓
5. Costs of reinsurance, as well as legal risk and credit risk taken on. ✓
6. Predictability of experience / Credibility and Stability of past experience ✓
7. Expertise in reinsurer's claims management
8. Not much scope for solvency/tax arbitrage

(ii)

1. Use the cedant's own experience to the extent that this is available.  
As expect few claims at this high-level, may consider experience from the reinsurer's entire book of business. ✓✓
2. Consider claims over the last 3-5 years - Choose a duration such that the number of claims above the AP is credible. ✓  
Given the low number of claims above this point, splitting these claims by risk-cells might produce poor credibility. ✓
3. Trend the claims up to the projection year accounting for medical trend and utilisation, changes in profile mix, any significant changes in benefits ✓
4. Determine the incidence of claims larger than R500,000 based on the past experience. ✓
5. Look at claims from below R500,000 for prior years to allow for those claims breaching the attachment point once adjusted for medical trend ✓
6. Once the claims have been trended, cap all claims at R1,500,000 when determining the severity. ✓
7. Determine what claims have been incurred but not reported for the current year. ✓  
This may be minimal as the insurer would be well notified of such large claims. ✓  
If an IBNR is calculated, one needs to consider whether to apply this to existing claims, or to increase the claim counts. ✓
8. Determine the trended cost of claims per life between the AP and reinsurance limit over the last 3-5 years ✓
9. Blend the burning cost per life over the last 3-5 years, accounting for the completeness and relevance of each year ✓

10. If the data used is not credible, one may consider fitting a stochastic distribution to the claims available, and using this to estimate an expected cost. ✓
11. OR if an underlying basis is available, the Experience rate can be merged with the Book rate. ✓
12. Once the BC per life has been assessed for the projected year, load the burning costs with reinsurer expenses, profit margins and reinsurance broker commission. ✓
13. Check the rates are competitive / sensitivity test the assumptions to ensure the premium is reasonable. ✓

(iii)

- Keep a larger portion of the risk (and profit) ✓
- Might be able to increase its market share overall as well as diversify its core business ✓
- There may be larger profit margins in the Insurer's rates. (e.g. the direct market may be underdeveloped with better margins) ✓
- Reduce transactional costs (reinsurance broker commission, can set up multi-year contracts) ✓
- Will require investment in administration, distribution channels and setting up capital reserves ✓
- More control over risk management in accordance with its policies (underwriting, claims and pricing) ✓
- May want to launch its own Health products (whereas if launched a Health product with a cedant, the business may go to a competitor in the following year). ✓
- Results in more stable results as their exposure will now include larger quantity of smaller cover amounts. ✓
- Possible advantage over other direct insurers if they have the capacity to self-insure large risks and thus benefit from no reinsurance premium costs, and thus potentially offer lower premiums. ✓
- Will become less attractive to potential cedants as there is a conflict of interest in its quotes. ✓
- Might have the expertise and opportunity, perhaps through a partnership, to access the market directly? ✓

## **Question 5 (15 marks)**

### ***Examiner Comments:***

***Overall comment:*** This question was answered poorly by the majority of candidates. Time may have been an issue but most candidates failed to realise that they are expected to apply judgement in this question. Strong candidates used the example given and applied considerable judgement – while explaining their thought process - to arrive at satisfactory answers for the renewal premium

***Part i:*** Answered poorly with no students naming the retrospective and prospective methods in their answers. The stronger students acknowledged that experience rating can be based fully on past claims experience but none alluded to the retrospective adjustment of premiums paid. Most students explained the credibility method adequately with the stronger candidates indicating that volume of data and experience affects the credibility factor.

Many candidates tended to emphasise points related to NCDs which were not relevant in this question.

***Part ii (a):*** Most well-prepared students performed adequately in this part of the question and gained at least half of the marks. Strong candidates recognised that large claims need to be added back in and that the latest renewal year was incomplete. Very few candidates realised that one cannot simply blend the burning costs together without looking at the trends over and above inflation and therefore ended up with very low claim costs per life per month.

Interestingly, candidates who performed well in terms of the actual pricing of the premium tended to leave out easy marks related to checking premiums for competitiveness and adding margins for expenses and profitability.

Weak candidates gave generic answers related to the pricing exercise without referring to the example given. Some credit was given for relevant points but candidates who did not apply group pricing methods to the example failed this part of the question.

***Part ii (b):*** Very few candidates gave more than generic bookwork answers here. Candidates also answered this question jointly with part a and thus received no marks for this part of the question. Stronger candidates thought about the example and used their answer to the previous section to generate points here.

***Part iii:*** Overall, candidates gave adequate answers although many mentioned Free Cover Limits as a condition. This would apply to products which have a defined benefit and thus aren't relevant to indemnity products such as PMI.

### **(i) 3 marks**

Approaches to experience rating:

- can be applied retrospectively or prospectively
- prospective is based on prior period experience and applied to future rate.
- Retrospective is adjustment to initial premium based on actual experience.
- Can be based on number of claims or amounts



- Credibility approach has Z factor as a rating. Z is from 0 to 1 and is weighting applied to own experience vs. book rates
- Value of Z depends on volume of claims and size of group.

Renewal year	Number of employees	Reported claims (R)	Large claims Number	Amount (R)	Gross up
2011	875	871 000	-	-	871 000
2012	900	1 301 300	1	270 000	1 301 300
2013	950	1 655 000	1	390 000	1 655 000
2014	1 000	1 195 000	-	-	1 593 333
				660 000	5 420 633
				13,9%	

Renewal year	Claims less large	Gross up	Infl factor	Inflate	Per employee	Trend
2011	871 000	1 001 650	1,464	1 466 516	1 676	
2012	1 031 300	1 185 995	1,331	1 578 559	1 754	4,7%
2013	1 265 000	1 454 750	1,210	1 760 248	1 853	5,6%
2014	1 593 333	1 832 333	1,100	2 015 567	2 016	8,8%
	4 760 633					
					2 144	6,4%

**(ii.a) 8 marks**

Steps to determine:

- Convert 2014 experience to full year (1 195 000/0.75) (credit for any reasonable grossing up factor).
- And adjust for outstanding claims
- Adjust for large claims by using grossing up factor (determined on experience of whole book).
- 1.15 for this data (sum of large claims/net claims)
- Inflate to 2015 data using 10% and assuming midpoint applies
- Convert to per employee basis
- Observe increasing trend (in real terms)
- Apply a trend factor taking into account midpoint
- Calculate book rate for covered employees
- Determine credibility factor for group size and experience
- Gross up for expenses and loadings
- Make market comparisons

*Mark allocation: Some points were deemed more important than other so full marks were given for:*

- *Scaling up the 2014 renewal year claims by 3 months and showing the factor (half mark if no factor applied and scaling up is only mentioned)*
- *Removing large claims.*
- *Inflating to 2015 monetary terms*
- *Calculating a per member cost*

*The rest were given half marks.*

**(ii.b) 2 marks**

parameters:

- unreported claims
- gross up factor
- credibility factor
  - office practice
  - market practice
  - volatility (by size)
  - client expectations
- Expenses
  - Expense analysis per functional area)

**(iii) 2 marks**

- no changes in working practices, employment conditions, recruiting
- premium subject to adjustment for covered employees
- may have standard exclusions

*Marking: Credit was given for relevant conditions that the insurer may impose on any group scheme in a general scenario.*

- *Exclusion of pre-existing conditions*
- *Compulsory membership*
- *Minimum take up if voluntary*

## Question 6 (14 marks)

### *Examiner Comments:*

*Students were challenged in applying the concept of risk adjustment with this question. Part (i) was answered reasonably well but in part (ii) students tended to provide a general response of “pricing” or “reserving” without further explanation of the role of risk adjustment. Part (iii) was handled reasonably well but students lost marks on part (iv) by being too brief and not providing distinct (independent) factors.*

(i) 3 marks

Risk adjustment

- normalizes populations according to specified risk factors
- Is applied to historical data

Risk prediction

- used to predict future costs
- with reference to differences observed in the past

Case mix adjustment

- is a special case of risk adjustments
- used to compare treatment costs

(ii) 1 mark

- experience analysis/rating
- risk based reimbursement
- identification of high claimers

(iii) 4 marks

male age 48 with health conditions 1 and 4

Risk factor = age/gender + HC1 + HC2 + multiple conditions  
=  $0.57 + 0.2 + 0.07 + 0.08 = 0.92$

a female aged 68

Risk factor = 0.94

Average claim cost of male expected to be  $0.92/0.94 = 2.12\%$  lower

(iv) 6 marks

Investigations:

- collect data for adequate period eg 2-3 years
- data needs to include all possible factors
- conduct hierarchical analysis to identify factors that explain variation
- investigate availability of information
- calculate explanation of variance per factor added
- prioritize factors
- consider value of adding factors vs cost of collecting the information

Other factors: (0.5 mark each max 2 marks)

- Region
- Income level
- Occupation

- Industry
- Level of education
- Period of membership
- Hospitalised on prior period

### **Question 7 (23 marks)**

#### ***Examiner Comments:***

*This question required application to the specifics of the question and the generation of sufficient points to cover the mark allocation. The question also required students to consider the perspectives and interests of different stakeholders i.e. the insurer, the service providers and the policyholders.*

#### **i. 5 marks**

*Uncertainty around cost of cover for PMI in a new market using another market's data:*

- Differences in lifestyle and prevalence of medical conditions
  - e.g. obesity linked to heart disease and diabetes
  - Leads to differences in frequency
- Difference in demographics
  - Aging population, leads to increased demand for healthcare services
- Effect of innovation on the cost of medical treatment covered
  - e.g. Availability/use of more sophisticated medical technology may increase the cost of cover
  - e.g. Innovations in surgical procedures may shorten the required recuperation time in hospital
  - e.g. Availability of health care resources – increased access increases utilisation, and vice versa
  - e.g. Differences in availability of clinics or cheaper facilities for less serious conditions
  - Leads to differences in cost of care
- Differences in policyholder and healthcare provider behaviour
  - e.g. could result in higher utilisation of medical services
- Differences in claims control and fraud
  - Poor claims control can result in insurer paying claims that should have been excluded due to benefit limitations
- Effect of introducing claims management processes such as preferred providers or managed care
  - e.g. negotiated fees
- Currency fluctuations
  - Less developed country vs well developed country and the currency rates with exporting countries
  - leads to volatility in cost of medical treatment that relies on imported equipment or pharmaceuticals
- Regulation overseeing products offered
  - Differences in cover, benefit limitations and exclusions
- Differences in distribution channels

- Different mix by distribution channel may also result in different claiming patterns and experience

[Total max 5]

## **ii. 10 marks**

*Advantages and disadvantages of using the electronic record:*

### Advantages

#### Marketing

- Positively received by policyholders, leading to increased volumes of business or promoting existing policyholders to stay with the insurer
- Positively received by providers, assisting with building relationships
- Competitive advantage if tool is perceived to be useful and/or the best

#### Better data

- More complete data set for the insurer, resulting in more accurate pricing
- Insurer receives data timeously:
  - reducing lag to receive data
  - Helping to refine IBNR reserve
- Improve the care provided by doctor as they have all the information required to make informed decisions – also less duplication of tests saving on the costs of these tests
- Reduce risk of error in data due to manual capturing, improving the quality of the data
- Can have checks in place to capture data correctly, e.g. alphanumeric vs numeric vs special characters
- Can encourage or enforce certain data fields to be input, e.g. ICD10 codes
- Collect clinical results, resulting in better understanding of the epidemiology of the policyholders (leading to more accurate pricing) and better understanding of the quality of care provided
- Large amounts of data to track different types of health hazards linked either to medical, environmental or social factors

#### Submitting claims

- Faster, easier
- Can use the tool to apply for pre-auth and grant/deny it
- Can determine co-payments applicable or benefit limits reached/available etc. via the tool immediately

#### Save on costs

- Less duplication of tests, and less unnecessary tests
- Preventing hospitalisation if appropriate treatment protocols are followed correctly
- Efficiencies gained by electronic transfer of data instead of manual data capturing
- Improved coordination of care improves health status

### Reduce admin burden

- Assist doctors with creating and managing appointments
- Real-time alerts to doctors on patients' conditions, tests required, time elapsed since last consultation etc.

### Open communication with doctors

- Educate doctors on best practice
- Give guidance on treatment protocols
- Alerts doctors to potential treatment complications such as co-morbidities – improving quality of care.
- Educate on latest research findings and generics released
- Provides support to doctors for decisions made in care

### Disadvantages

#### Poor uptake

- Will render all advantages meaningless

#### Legal considerations/ Regulation risk

- Privacy issues around what information can and cannot be shared
- Risk of providing incorrect data
- Who does that data belong to (policyholder, provider, insurer)
- Needs adequate control and standards
- Regulators may have minimum requirements before it can be launched, including ongoing reports to demonstrate compliance
- IT security / Data security – risk of being hacked and data stolen.

#### Increase costs

- Development expenses, including possibly needing more IT staff, more space and additional systems
- May increase cost of cover by doing more screening and more tests
- Training sessions to train doctors to understand and use the tool, and to train insurer's staff to field questions about it and to use the data, and train brokers to explain tool to policyholders

#### Reputational risk

- Confusing to doctors and policyholders
- Risk that the tool doesn't work well
- Added admin burden to doctors, including data overload
- Patients may get less dedicated time with doctor in the room if the doctor is focused on the electronic record and all the fields needed to be filled in

#### Competition

- How does the tool compare to the tool offered by competitors
- Will doctors be able to learn to use both tools

#### Systems integration

- Will the tool work with the systems that the providers have available, across all providers in the care chain

**(iii) 8 marks**

Corrective actions

In order for *appropriate* action to be taken, it is imperative that the company *understands* the reasons for any adverse trends in the experience.

*[1 mark for comment]*

- Update assumptions for future experience – e.g. understand if trends are changing and update assumptions so that they are appropriate for expected future experience
- Re-pricing of products – e.g. include larger margins
- Re-design of products – e.g. through introducing benefit limits or through stricter referral patterns or protocols in order to access benefits
- Change the investment strategy – e.g. an investment strategy that maximises investment returns for the acceptable level of risk
- Change the sales strategy – e.g. which products are marketed through which distribution channel, change the commission structures etc., target populations with the best claims experience/the most profitable group
- Change the reinsurance strategy – e.g. take out reinsurance to protect against future adverse experience
- Change the underwriting strategy – e.g. apply stricter underwriting in order to better price poor risks or to exclude members that do not meet the application criteria
- Change the profit distribution strategy – e.g. to shareholders
- Re-organise the workforce and IT systems to make more efficient use of expensive resources
- Change managed care arrangements – e.g. negotiated fees, introduce risk-sharing agreements

*[½ mark per action, plus ½ mark for an example]*

*[Max 8]*