

EXAMINATION

September 2007

Subject SA1 — Health and Care Specialist Applications

EXAMINERS' REPORT

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable.

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Chairman of the Board of Examiners

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Comments

Candidates who approached the problems, especially the more substantial elements of each question, in a methodical and detailed manner were far more likely to satisfy the examiners and receive a pass in the subject. Generally, candidates lost marks by giving insufficient detail in the answers. The mark allocation for each question part gives an indication of the relative length of answer or number of points to be made to gain full marks. Usually each valid point in the answer would normally attract 0.5 marks whilst the more basic elements e.g. details in a pricing basis such as age and sex, would attract 0.25 marks.

Some papers were not clearly marked as to which part of the question was being answered.

Marks may be lost where answers are difficult to read.

Comments on individual questions are set out below:

Question 1

There were instances where candidates did not address the question e.g. Q1 (ii). In that question, candidates gave their view on what the commission basis should be rather than recording the pluses and minuses of each of the three commission bases. Few, if any, linked their answers to part (i) of the question where they were asked to set out a framework for evaluation and then in part (ii) use that framework. The conclusion is that the candidates did not read the question properly.

Question 2

At present, there is only one guidance note, GN21. It was inevitable that at some stage the examiners would visit this subject. Few of the candidates answered this question with confidence. Some were able to answer the question to a degree from first principles.

Question 3

For Q3, some candidates did not realise that there were new ABI guidelines so the concepts of core and additional conditions no longer applies in Critical Illness new business.

There was a variation in the standard of answers, some reasonable, many not so. Some candidates found that the sections on reserving and pillar 2 very difficult. Q3 (iv) on the risk charge was poorly answered, students should realise in what form the cancer statistics are published.

1 Direct salesforce — Face to face

Usually employed but may be self employed

Commission payments

Salary

Combination

Direct sales — Telephone selling, Internet

Inbound

Outbound

For telephone selling, remuneration as above

Phone bill for telephone selling

Direct Marketing

Mailshot

Costs of campaigns / expense of contact

Press advertising / return coupon

Advertising costs

Combination of above eg press and generating inbound telephone calls

Other costs:

Head office / overheads

Direct sales force – expenses (eg office space, cars)

Training costs

Compliance costs

For internet selling, cost of developing and maintaining software

Overall

No consistency between products

Likely to be implicit bias towards a product type as a result of different distributor reward so strong likelihood of distributor bias

Potential regulator interest

Differing approaches create admin complexity

None of the remuneration approaches reward profitability/quality of business

How does this compare with competition

Attitude of distributors

Private medical insurance

Distributor

Simple, easy to understand

Depends on level of payment as to whether this is a suitable return for investment of time in sale

No incentive to sell more comprehensive policies as flat remuneration

May be better of selling 2 single life policies than one joint life policy

Incentive to focus on PMI if there is a possibility of exceeding 1000 sales in a year.

Timing of commission payments

Do sales include renewals?

Insurer

May be high lapses as no retention incentive

Need to monitor lapse and resale as no apparent mechanism to address “churn”
Simple to administer as only one payment per year
May result in lower average premiums than anticipated as no reward for higher premium business

Customer

May be sold inappropriate policy given:
 strong distributor incentive to sell PMI if approaching 1000 policies
 no distributor reward for policy retention
 no distributor incentive to sell comprehensive cover

Income Protection

Distributor

Simple, easy to understand
Payment made early in process. Attractive.
Higher value sales rewarded by higher commission

Insurer

Big risk — policy does not appear to need to go in force before commission is paid
May receive applications for business with no intention of taking out policy
Will end up paying commission on business we decline
May be high lapses as no retention incentive
Need to monitor lapse and resale as no apparent mechanism to address “churn”
Relatively simple to administer
Full commission paid on policies that lapse quickly to because there is no clawback
New business strain

Customer

May be sold inappropriate policy given:
 high product bias towards this policy
 no distributor reward for policy retention so no incentive to ensure that needs are met.
 commission largely independent of policy term so may be sold short-term policy (and then resold following year)

Critical Illness

Distributor

Only get drip feed commission, amounts likely to be low and so low incentive to sell
Continue to receive reward if appropriately service existing book of business
Higher value sales rewarded by higher commission
Distributors may be enticed elsewhere
Commission payments do not reflect when most of the work done

Insurer

May not receive high new business volumes as level of commission may appear low against market (if competitors pay lump sums)
Lapse performance likely to be good as retention incentive
Admin overhead of paying low commission amounts on a monthly basis
Commission outgo more closely reflected in receipt of premium income

Customer

May not be sold CI even if meets needs as low up front commission payment
May be able to price more cheaply as expected higher retention levels but offset by admin and process complexity

2 (i) Reasons for plan

Used for directors and other long-serving former employees
Provision of “Cradle to grave” cover
May be in the company ethos of benefit provision
Attract and retain staff

(ii) Disadvantages

Guaranteeing PMI cover for life
Expensive if insured
Can be very expensive if self-insured in the event of a large claim
Rapidly increasing cost for PMI with increasing age
Complex to administer
Expensive in time and money to administer
PMI claims increase at an annual rate well in excess of RPI inflation
Substantial liabilities created by the introduction of this scheme
Difficult in HR terms to restrict the cover to retiree if spouses covered whilst in employment
May have risk of accelerated claims before retirement if spouses not covered post retirement
Legal/actuarial costs
Longevity risk

- (iii) The eligibility conditions for membership under the plan**
The membership of the plan
The potential future beneficiaries of the plan
The entitlement, if any, of spouses and other dependants of members to benefits under the plan
Details of the principal and other benefits of the plan including any limits, if any, on treatment provided
Where the costs of a plan are partially met by members, the nature of the employer's subsidy has to be made clear.
Any anticipated changes in the subsidy, as a proportion of plan costs, should be explained.
Details of recent withdrawal experience.
Details of recent mortality experience.
Medical costs experience
FRS17, IAS19 requirements
Plan expenses

(iv) **Methodology and assumptions**

Actuarial Techniques

Follow actuarial techniques similar to those used to determine the liabilities and periodic costs of a defined benefit pension plan ie projecting claims costs and expenses and discounting back allowing for interest and demographic decrements; possibly add in margins

Sub-division of data

Consider whether to incorporate in calculations:

- the dependence of medical costs on age and gender
- different medical costs for different geographical locations
- or different sub-groups of plan members

The extent of the subdivision will depend on the credibility of the data

Assumptions on future medical costs

Incorporate in calculations the expected temporal changes in medical costs over future years due to changing incidence frequencies, changing costs of treatments and changing patterns of treatments.

Ensure that the assumed rates of temporal changes in medical costs are consistent with any underlying assumptions for earnings and price inflation. However, in most cases the expected temporal changes in medical costs will be more complex than the expected rates of price or earnings inflation.

Where appropriate, incorporate in the calculations changing incidence frequencies or changing “real” costs of interventions.

Expenses

Make allowances for the costs and expense inflation of self-administration by an employer – e.g. might use national earnings index

Tax

Investigate what allowance (if any) should be made for taxation on investment income of funds invested.

Investigate what allowance (if any) the calculations should make for future tax relief on claims or premiums.

Mortality and other assumptions

Assumptions regarding mortality and withdrawal experience are generally of particular significance in the valuation of post-retirement medical plans.

Consider future expected improvements in mortality, possibly linked to changing incidence rates and types of medical treatment, allowing for the size and amount of selection of each group of the plan.

Credibility

The report should compare assumptions with the past experience of the plan under consideration and the actuary's experience of similar plans.

Consider factors which may mean that past experience may not be a fair reflection of future experience.

Consider how much credibility should be placed on the recent experience of the plan, with particular regard to the size of exposure and the volatility of medical costs.

Consider how much credibility to give to recent withdrawal experience.

- 3** (i) The suggested product is a form of accelerated critical illness and so meets the standard needs of ACCI but with the limited cover

- Income (if standard lump sum payment commuted)
- Medical costs
- Repay part of mortgage (or total on final payment)
- Business partners/business stability
- Recuperation after illness
- Medical Aids
- Lifestyle changes

Standard CI plan pays a lump sum which is independent of the severity of the CI event.

The scope of cover of a standard CI plan is wider

Plan better matches severity requirement reducing windfall benefits

It may meet needs on incidence of cancer but it ignores financial distress arising from the onset of all other illnesses.

It is less comprehensive (but cancer is a major cause)

For the same sum assured it should be cheaper than a standard plan.

Provides death benefit for dependents

Provides peace of mind for the policy holder

- (ii) The target market may be very similar to the existing ACCI plan.

Cancer is a key risk for young lives for both males and females.

Females may be particularly interested because of high media coverage of cancers affecting women and through screening programmes

The plan could be seen as appropriate for the mortgage market if the initial sum assured is set equal to the loan.

Plan should be cheaper than traditional ACCI so may appeal to lower socio-economic groups

Complicated product so will require face to face sales.

Likely to be too complicated for direct.
New product to the market so it will be difficult for IFA's to compare against other providers.
Most appropriate distribution is likely to be tied agent or direct sales force until the product has become established (then offer through IFAs)

(iii) **ABI requirements**

To be called CI plan must cover heart attack, cancer and stroke.
No other condition is compulsory
For certain conditions insurer must use model wording
If a standard exclusion clause is included it must follow the model wording.
Insurers are free to pick exclusions.

Suggested plan does not meet ABI requirements as there is no cover for stroke and heart attack.

(iv) **Pricing approach**

Standard formula for pricing ACCI is $i_x + (1 - k_x) * q_x$ where

i is the incidence rate for the CI at age x
 k is the proportion of deaths due to the particular CI event
 q is normal mortality

This implicitly assumes that all lives who suffer from cancer die from cancer and so the two terms are mutually exclusive.
We can apply the same approach for this product
This product will be cheaper because of the stepped payments. The total payment under the plan may be 0, 25%, 50% or 100%. There may be multiple payments. The maximum payment is limited to 100% and all earlier payments are offset.

Payments will either be for cancer or for death from any other cause than cancer.

Cost of death from any cause other than cancer is $(1 - k_x) * q_x$ where k_x is the proportion of deaths from cancer.

Assume for cancer all policyholders go through stages early diagnosis — intermediate — serious (note transfer from each stage could be instantaneous)

Payments will be 25% + 25% + 50%

Let $i_x(1)$ be probability cancer diagnosed at early, intermediate or advanced stage
 $i_x(2)$ probability cancer diagnosed at intermediate or advanced stage
 $i_x(3)$ probability cancer diagnosed at advanced stage

Then cost is $0.25 * i_x(1) + 0.25 * i_x(2) + 0.5 * i_x(3) + (1 - k_x) * q_x$

If a life is diagnosed with cancer at the intermediate stage they will be included in $i_x(1)$ and $i_x(2)$.

This formula effectively over costs lives who are diagnosed with cancer and subsequently die of a non-cancer cause. The above formula assumes that the payment on death will be 100% when, in reality, it will be reduced by the earlier payments. This is also a feature of the standard ACCI formula. It is difficult to make a formulaic adjustment as we are unlikely to have the previous medical history of a life at death.

Can calculate a rate for the general population using population data.

Would need to adjust this for the insurance population and then allow for particular features of the product and target market.

To do this can look at cancer incidence under the current ACCI plan and compare this with the cancer rate under the general population.

Note ideally would adjust rates so they are applicable to the same exposed to risk (ETR) i.e. for the general population the ETR is all lives alive while for a ACCI plan it is all lives who have not previously been diagnosed as having a CI.

Would need to adjust for underwriting selection.

Would need to adjust for additional rating factors such as smoking

Would finally need to decide how the resulting risk charges should be adjusted to allow for future trends such as the earlier diagnosis of particular cancers as a result of the introduction of a screening programme.

(v) **Taxation in model**

This is a form of ACCI so treated as a standard life plan.

Proprietary office so tax on the maximum of I-E or profits assessment (NC1)

Notional Case = undistributed surplus + transfers to shareholders – losses brought forward.

If taxed on I-E then use net expenses and net investment return in the profit test model (i.e. multiply expenses and investment return by $(1-t)$ where t is the tax rate.

(vi) **What reinsurance arrangement**

Will want reinsurer expertise therefore want a proportional type arrangement
Significant quota share (e.g. 50%)

Maximum cover is £500k so want some surplus cover (e.g. maximum retention £100,000)

Because of uncertainty in pricing may seek profit sharing

As rates guaranteed will want guaranteed reinsurance rates

Risk premium or original terms

Will seek both and decide on which gives best value to cedant

Would look at financing (rebate/commission) if capital cost if reinsurance is attractive

Treaty rather than facultative

(vii) **Reserving**

Mathematical reserves must use a prospective valuation method using prudent assumptions with sufficient margin for adverse deviations.

Must avoid any future valuation strains.

Must allow for with profit payments if appropriate

Valuation rate of interest cannot exceed 97.5% of the risk-adjusted yields on the backing assets (risk-adjusted means reducing the yield on the backing assets to allow for the risk of default)

In respect of sums to be invested in the future at unknown rates of interest additional restrictions apply.

Must make specific allowance for guarantees

Must make specific allowance for options

When allowing for reinsurance the mathematical reserve used is the maximum of 85% and the ratio of net-of-reinsurance reserves to the gross-of-reinsurance mathematical reserves.

Complicated

Policyholders need to be split into those that have never claimed and those that have already made a claim.

The former group can be valued in the same way as traditional ACCI policyholders.

For the later group we know that the policyholder already has some form of cancer and so needs to be treated as substandard risk.

This plan does not exist in the market and we are offering guaranteed rates; making a specific allowance for the guarantee may be problematic.

Note that the guarantee charge used for traditional ACCI may not be appropriate.

(viii) **Pillar 2**

Expressed in terms of guidance rather than rules.

Firms submit own confidential ICA calculations to FSA

FSA accepts or issues ICG

Example risks:

- Market and interest rate risk
- Credit risk
- Persistency risk
- Insurance risk (mortality, morbidity)
- Risks attaching to firm's pension scheme
- Liquidity risk
- Reinsurance risk
- Group risk
- Operational risk
- Expenses risk

ICA calculations should be consistent with 99.5% certainty of solvency within a one-year time frame or, if appropriate to a firm's business, an equivalent lower confidence interval over a longer time frame.

Firms need to conduct stress and scenario tests in respect of each risk

Calculations should be based on market consistent techniques which are likely to require stochastic modelling.

Within the ICA calculations it is acceptable to take credit for diversification benefits that exist between the various risks that recognise the degree to which individual risks are correlated.

(ix) **Specific insurance risks**

Initial claim estimate is wrong because of volatility or based on inappropriate data

Medical advances change risk in future e.g. screening results in more diagnoses, screening accelerates diagnosis.

Legal/ Regulator changes requirements for payment of valid claim (e.g. what insurer thought was intermediate is interpreted by courts as serious).

Shock event like Chernobyl

Lapses (selective withdrawals) – assumptions may be wrong

END OF EXAMINERS' REPORT