INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2013 examinations

Subject SA1 – Health and Care Specialist Applications

Introduction

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

D C Bowie
Chairman of the Board of Examiners

July 2013

General comments on Subject SA1

Candidates who approach the questions, especially the more substantial elements of each question, in a methodical and detailed manner are far more likely to pass the subject. Candidates will gain few marks if they do not address the question asked but merely write around the topic of the question. 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. It is often helpful to use subheadings when answering long part questions.

Comments on the April 2013 paper

Overall the paper was at the more difficult end of the range, although well-prepared candidates scored well across most of the whole paper. As in previous diets, questions that required an element of analysis or application of knowledge were less well answered than those that just involved repeating bookwork. The comments that follow the questions concentrate on areas where candidates could have improved their performance. Candidates approaching the subject for the first time are advised to concentrate their revision in these areas.

1 (i) Critical illness contracts provide benefits on the diagnosis of a "critical illness" or the specific illnesses covered under such contracts.

Accelerated critical illness pays out upon death or diagnosis of a critical illness, whichever occurs first.

If the life insured suffers a critical illness then the sum insured is paid and the policy is terminated.

Most policies accelerate 100% of the sum insured, but some accelerate a portion with the balance paid upon subsequent death.

Stand-alone critical illness policies only provide cover against critical illness and do not provide any benefit in the event of death. Occasionally such policies may offer a nominal sum in the event of death before a critical illness is suffered.

Usually there is a survival period requirement.

Benefits are only paid if the insured event happens within the contract term.

The benefit amount is pre-specified.

Benefits may be tiered.

(ii) Cancer, heart attack and stroke must be included in UK contracts.

(iii) The nurse might talk through the answers given in the application form. He might challenge statements regarding, for example, alcohol consumption and drug use or the amount of exercise taken. He might discuss diet with the applicant(s).

He might take some "easy" measurements, such as height, weight, resting pulse rate, blood pressure and/or a blood test.

He might provide recommendations or advice about how to lessen the policyholder's chances of illness or advice on improving the healthiness of their lifestyle, e.g. by joining a gym or going for walks.

(iv) **Per given model point**

This change would be expected to result in more accurate estimation of the lifestyle factors. Hence, for a given level of recorded alcohol intake (for example) the life insured probably actually drinks less (i.e. the amount on record, rather than somewhat more) and will be correspondingly healthier. So for a given model point, morbidity would be expected to be lighter.

Whole portfolio

The experience of the book as a whole will depend on whether there are changes in the make up of the population. If the same set of life insureds are taken on the books, then actual overall morbidity experience will not differ by much at all, at least in the short term.

A different mix of policyholders may arise depending on how distributors view the re-launched product. If the new proposition attracts a higher proportion of healthier lifestyles or honest policyholders, then overall morbidity experience may lighten.

The morbidity experience may also lighten if those opting for the nurse's visit act upon health improvement recommendations made by the nurse

Those opting for nurse visit

People who were intending to understate alcohol consumption (for example) would not be expected to opt for the nurse visit. So for the people who do opt for the nurse visit, a reduction in anti-selection and a generally healthier population being covered may be seen. Hence morbidity may lighten for that group, although the mix of diseases/illnesses incurred may differ.

"Cash rich, time poor" people may be less likely to opt for nurse visit

Those not opting for nurse visit

For the group who do not opt for the nurse visit, there will be a higher proportion of individuals who will understate their alcohol consumption (for example). Hence, the morbidity experience for this group may be heavier.

(v) **Expenses**

The costs of underwriting will rise – these include the nurse's time spent visiting individuals and travel costs and the additional administrative burden of analysing and processing the information obtained. This may be a significant increase.

It will be difficult to price this into the group that opts for the nurse visit, as they have been promised lower premiums, so the assumption for underwriting expense for both groups will probably need to increase. To the extent that it is hard to price this in without becoming uncompetitive, it may hit profit

The costs of re-launch will also need to be factored into the expense loadings and profitability assessment. This will include training nurses, retraining in-house admin staff, producing new literature and the cost of system changes to differentiate the policyholders who opt for the nurse visit.

Commission may need to be increased to persuade financial advisers to support the nurse visit option, given the additional hassle

The recovery of expenses will be affected by initial conversion rates, which may differ for the nurse-opting group.

The insurer will have to consider whether any additional profits from the product (either through improved experience or higher volumes) will be sufficient to cover the extra costs.

There may be a reduction in claims management expenses as a result of the extra upfront underwriting for those opting for nurse's visit.

Volume

The change will impact the volume sold.

The premium discount could potentially encourage higher volumes.

New business volumes will depend on the expected attractiveness of the proposal and on how it compares with what is being offered by competitors

Although the nurse visit is optional, premiums will go up for people not opting into the nurse visit. So for people who don't want a nurse visit, the product may become less competitive. This may be compounded by distributor reaction, who may not want to even broach the subject of a nurse visit. Alternatively, if distributors buy in to the concept, they may recognise the benefit to their customers and try to sell the product (with nurse visit opt-in)

For some customers, a nurse visit would be a chore to be avoided. However, there are individuals for whom this would be viewed as an additional benefit of the policy

Critical illness is very price sensitive, so volume will depend crucially on the price charged. If the price needs to increase to take into account the increased underwriting expense, this will reduce volumes. Assuming the product is profit-making, this will reduce total profit. Lower volumes will also increase per-policy expenses (due to spreading fixed costs over lower volume) so further reducing profit margin per policy.

However, lower claims decline rates (due to better upfront underwriting information) may result in a better reputation so new business volumes might increase going forwards

Mix

The new business mix assumed in pricing work will need to be adjusted. In particular, separate model points will be required for those who opt for the nurse visit and those who don't. This would only in itself impact overall profitability if there are cross-subsidies between model points and these should be minimised in pricing. However, it is likely that the discount given to those who opt for the nurse visit has to be set as greater than would be theoretically

appropriate (with full expense loading) in order to be sufficiently attractive. Therefore profitability would be highly exposed to more opting than expected.

Nurse visits may potentially be more attractive to some subsets of the population e.g. according to socio-economic status (not just health status).

Morbidity/underwriting impact

If the morbidity under the contract can be more accurately predicted, then this could improve profitability by reducing losses made when morbidity turns out worse than expected. However, if the true morbidity level is reflected in the new price charged then this could be a minimal impact. If morbidity becomes less predictable for the group that does not opt for the nurse visit because the level of under-disclosure is unknown then this may counteract the opposite change in the group that does have a nurse visit.

Mortality

There may be similar changes to mortality as for morbidity, which is particularly important if accelerated critical illness business is offered.

Lapses

Lapse experience might be lower for the group who opted for the nurse visit as they may be more committed to the product, having undertaken this initial additional process. This may improve profitability or be allowed for in the pricing rather than taken to profit.

Since premiums will be lower for people who opt for the nurse visit, there may be a risk of lapse and re-entry of existing business, which would reduce the profitability of the overall book of critical illness insurance.

Reinsurer rates

If reinsurers believe that this will result in more accurate morbidity estimation, they should reduce their rates. This may improve profitability or may be used to support the premium discount for those who opt for the nurse visit. However the reinsurers will need to revisit any underwriting manuals they provide, and they may make a charge for this work which will offset the above beneficial impact.

Other

Different levels of risk of underestimating morbidity may feed through to any margin in the risk discount rate or to the ICA/reserves, changing cost of capital.

(vi) Review profitability – this is based on assumptions being borne out in practice so will only be indicative.

Consider volumes sold before and after – is it popular?

Consider the proportions opting for the nurse visit.

Consider conversion rates (from proposal to sale) before and after as well as between those that opt for or against the nurse visit.

Can survey distributors and clients to find out what they think.

Look at the actual costs compared with the estimated benefits – is it cost effective?

Compare morbidity for the groups with and without the nurse's visit and, as a whole, against previous morbidity.

Consider mix of business by size/distributor channel.

Has there been any media interest or other publicity or interest from competitors? If so, how has the proposal been received?

Are there any other unforeseen advantages or disadvantages (for example, have there been issues relating to the recruitment and training of nurses)?

Ask nurses about the visits - are there any issues with the home visits, do the nurses have to answer any questions that are too tricky?

Has the cost of reinsurance been reduced overall?

Parts (i) and (ii) were bookwork questions. Part (i) asked about benefits so candidates addressing other features of the products would not have been able to score for such points. Some candidates confused stand-alone and accelerated critical illness. This should not have troubled well prepared candidates but in fact emphasised the need for all candidates to learn the bookwork.
Most students were able to attempt part (iii) successfully, providing a range of ideas. However, only the better candidates did well on part (iv). A methodical approach would have assisted in covering a wide range of the points available. Thinking logically about any genuine differences in experience and any other features would have helped.
Part (v) was also less well answered with candidates tending not to generate a sufficient range of separate points, given the high number of marks available. It was, however, good to see many candidates setting out their answers under different headings related to the main areas to be covered such as expenses, business volume, lapses.
Part (vi) was generally better answered. Candidates who appreciated that the actual morbidity experience on this product would not be known for some time were most likely to score highly here.

2 (i) **Formula for taxable trading profit**

$P + I' + A' - E - C - (V1 - V0) - L$

Where:

P = premium receivable
I' = share of investment income
A' = share of change in value of the assets (may be negative)
E = expenses including commission
C = benefit payments made
$V0$ = value of liabilities at beginning of year
$V1$ = value of liabilities at end of year
L = absolute amount of any loss brought forward from previous year end

All the above relate to the OLTB share only.

From 1 Jan 2013, these amounts are based on the statutory accounts.

(ii) Premiums do not normally qualify for tax relief.

If the premiums are paid by the life insured then the benefits are tax free.

If the premiums are paid by the employer, the benefits are taxed as for group arrangements. This means that benefits payable directly to the employee (or to the employer on trust for the employee) are treated as part of the employee's remuneration and taxed as earned income.

Insurance premium tax is not generally payable but would be if the policy was classified as short term IP business.

(iii) (a) **1% increase to sum assured**

There will be a corresponding one-off increase to reserves. This will make the item V1 and hence (V1 – V0) immediately bigger than it would otherwise have been. Since this is a deduction from tax, it would reduce the tax paid in the current year.

Future claims will be higher, but so too will be the future releases from reserves which will largely offset against this. The impact in future years will therefore only be second order, in respect of the release of any prudential margin on the value of the additional sum assured
Any implementation costs will further reduce tax in the first year

(b) **Increasing premiums**

Tax increases with premiums paid, so this would tend to defer the tax payments. However, delaying the payment of premiums would also tend to reduce reserves. This will increase profits at the start of the policy and hence accelerate tax payable, offsetting the premium effect.

Overall, the impact may be a deferral of profit – particularly if development expenses are incurred up front.

But since the expected profit is the same, the total tax payable over the lifetime of the product would also be the same – provided tax rates remain unchanged

(c) **Move to lower coupon gilts**

The investment income part of the taxation calculation will be reduced, so this would reduce the tax payable. However, this will be offset by a rise in either the final redemption payment or the value of the bond over time.

If the gross redemption yields are broadly unchanged by the transaction then the total investment return (income plus capital gains) arising each year should also be unchanged. Hence there would be no material impact on OLTB taxation, although since a greater proportion of the contribution from these assets is in the form of mark-to-market value change rather than fixed income, the amount of tax paid in each year may be more volatile.

If the gross redemption yields are slightly higher, then investment return accruing each year (and hence taxation) would increase – and vice versa if lower. However, the difference in yields is unlikely to be significant unless the outstanding terms have also changed (and depending on the shape of the yield curve).

If any gains are crystallised, this may cause there to be capital gains tax payable or if any losses are crystallised then these may be available to offset against gains elsewhere.

There may be a secondary impact on the timing of taxation if the reserves change due to any difference in gross redemption yields on the high and low coupon bonds.

(d) **Accelerating claims settlements**

Some claims will move forward to the financial year prior to when they would otherwise have been paid. This will decelerate the tax due but will not change the total amount (unless tax rates were changing between financial years). The acceleration of the process might mean that claims expenses are higher, which would reduce profit and thus tax.

There also may be a second order offsetting impact due to reserves which might be slightly increased due to less discounting of claim - but only if the settlement delay was previously being allowed for explicitly

For part (i) few candidates were able to provide the complete, correct formula – this reinforces the need to learn (and understand) the bookwork carefully.
Parts (ii) and (iii) were not particularly well answered. Candidates should have basic knowledge of investments from CA1 prior to sitting SA1. Candidates who did not understand the difference between a coupon level and a gross redemption yield struggled on part (c).

3 (i) The scheme would have to operate in tranches, with the group policies included all starting on the same date.

The employer decides which subset of employees to register under this scheme, assuming that it does not have to be the whole company. The employer pays a premium based on the number of registered employees to the insurance company. This per employee amount does not vary by age, gender or health status and the same fixed per employee amount applies to all employers. Premium payment would usually be made at the beginning of the year. There will be no employer/group underwriting or rating or consideration of actual past experience.

The number of employees will have to be fixed for the period of cover but it will not necessarily depend on actual named employees, and leavers and joiners are not considered.

A sick employee will inform the employer as usual. If the employee is covered by the scheme the details, including reason for absence, will be notified to the insurance company. Employer and insurance company will carry out checks on the employee to ensure the absence is genuine and covered by the scheme definitions.

The absence would normally be managed by the employer to ensure the soonest possible return to work. However, in this case it might be in the employer's interests for the employee to be off sick for at least a week (e.g. extending four days' absence to a whole week) to help trigger a payment; therefore the insurance company is likely to carry out further checks to ensure that such practices are not taking place.

The employer pays its normal sick pay to the employee. The employer will reclaim sick pay from any statutory (government) schemes.

At the end of the year the insurance company will aggregate all of the claim data and calculate the claim percentage using its predefined method. It will need to make clear how to treat any absences which are in progress at the end of the policy year but which have not yet reached the one week limit. It will also need to make clear how to treat any linked claims.

If the percentage calculated is above the stated trigger percentage then the payments to employers will need to be calculated. The fixed per employee payment amount will be multiplied by the number of employees initially registered by each employer. The number of employees who are currently or have been sick at a particular employer will not have any effect on the

payment to that employer. Payments will be made from the insurance company to each employer, if the trigger level is met. Otherwise there is no payment from the insurer to the employer.

The scheme is likely to be renewable annually, so each participating employer can opt whether or not to continue.

There may be payments between the insurance company and any reinsurers if it has reinsured the scheme.

(ii) The product is quick and easy to purchase. The employer just needs to register a number of employees – there is no need to provide details of joiners and leavers. There is no underwriting of the groups covered and no adjustment is made for age or gender. Similarly, the ongoing administration for the employer is not onerous.

The employer will only purchase the cover if it appears good value. It could be seen as better than no cover at all if employer is finding it difficult or expensive to purchase more conventional group IP cover e.g. if own experience is particularly poor. The policy is annually renewable so there is only a limited commitment.

If the insurance company does not require a list of named individuals, then there is the potential for the employer to select against the insurer by registering less than the actual number employed and notifying any employee who falls sick (i.e. no need for those declared sick to be one of those nominally considered to be covered). Linked to this is the potential to influence the calculation by notifying more sick employees, especially if the employer is large and has registered a large number of employees.

There is potential for a windfall payment i.e. the employer may receive more than was paid out in sick pay plus premium e.g. if its own experience is better than that of the other employers purchasing these contracts, if its own average salaries are lower or if its own sick pay scheme is less generous, particularly due to casual or seasonal employment patterns.

The contract has scalability – the employer can reduce payment by registering fewer employees.

(iii) Any benefit received is not linked to the actual payments the employer will be making, so the employer could have made large payments to sick employees but receive little or nothing back from the insurer.

The product introduces exposure to the risk of the experience of other employers in the scheme being good, thus failing to trigger the payment.

The payout cashflow is difficult to plan for – it is basically "all or nothing".

There is a potential lack of transparency.

There is a risk of over/under registering.

It is a short term contract so the employer will not know whether it will be available the following year.

(iv) There is potential for legal challenge. There may be issues if the employers were not sure what was bought, i.e. they did not understand the product fully. It may not meet their needs. Similarly there may be issues with the terms and conditions if these are not sufficiently clear and tight. These could also lead to reputational risks or mis-selling issues.

Although it may be an acceptable product now, regulation or legislation could change so that it is no longer permitted.

There may be problems with the definition of the trigger percentage and also the risk that it is set too low. As the insurer does not have any existing experience for this type of contract, it will be difficult to set the initial percentage/premium. There is a risk that the model used is inappropriate. There is a risk that the average morbidity of the covered employees is worse than expected, thus triggering the payment more often than intended. There is also a morbidity risk from aggregation.

Employers have considerable scope to select against the insurance company e.g. will only purchase if expect a payout to be made that year, plus they choose the number of registered employees. However this anti-selection risk should be offset to some extent through employers potentially being more likely to purchase if they believe their experience will be better than average.

There is also a risk of "fraud" through possible manipulation by employers of their sickness figures in order to trigger a payment.

There is a risk that the insurance company will set up the scheme and there will not be a sufficient number of employers interested to make it viable, for example to recover the initial development and implementation costs. Similarly there is a risk of low renewal rates.

There may also be a risk that the number of employers interested far exceeds expectations, which would make the potential payout too onerous for the insurer. If successful, competitors may move in and steal the market.

There is a risk of the business mix (e.g. by age, sex, occupation) differing adversely from what was assumed in the pricing.

There are potential operational risks such as errors in the calculation of the per employee payments.

The costs of administering the business may be greater than expected in the pricing.

Counterparty risks arise if third party outsourcers or reinsurers are used.

The insurer may not be able to get reinsurance on acceptable terms.

(v) Allow a delay before calculating the final premium to ensure all claims have been notified.

The insurer may need to have discussions with all employers to ensure their returns are complete and accurate. Need to check accuracy of data provided and of the validity of the claims (i.e. strong claims management process). Perform ongoing verification work to reduce the amount to be done after the end of the year.

Ensure that terms and conditions are all clear, particularly that a "claim" is defined clearly and robustly. Also need to decide whether multiple claims during the period in respect of an employee are counted as separate claims or one claim. A clear process for dealing with disputed claims and for whether outstanding disputes can be ignored in the year end comparison will be needed.

The insurer may decide to restrict the types of occupation/industry permitted/geographic area to join the scheme and/or limit "registered employees" only to those actively at work at the registration date and/or insist on 100% employee coverage. The submission of the names of the covered employees as well as just the number may be required.

The definition of the percentage would need to be clear. The calculation of actual percentage would need to be verified by a suitable auditor to give it credibility.

Monitor the experience and review percentage/premium for future years.

Use reinsurance, if available for this type of scheme.

Outsource the administration in order to control expenses.

(vi) The source and scope of the government sickness data should be considered. Is it from insurance companies, based on similar "all or nothing" schemes or genuine conventional group IP as well, or even would individual IP data also be included.

If based on insurance industry information, which insurance companies contribute data. Are the claims definitions consistent and similarly deferred periods, linked claims etc. Is the definition of a scheme equivalent between companies.

Need to consider underlying differences in gender and age mixes and in occupation and employer mixes. Other insurers will also have different underwriting standards. If the underwriting standards are weaker than those of this insurer, it could end up paying out more than expected. Would data be limited to lives on standard terms.

If based on population sickness data, then need to bear in mind that the morbidity characteristics will differ from the insured population. In particular it would not be age relevant, introducing the insurer to exposure from morbidity trends in the youngest and oldest age ranges. However, pricing would be easier as past experience is available.

If the government made retrospective changes to the data or calculation, would the insurer be expected to revise its payment.

If the percentage had been close to the trigger point, this could lead to requesting repayment from employers which could be difficult, especially if they are no longer in existence. Similarly the insurer would have to keep a reserve in case it had to payout in respect of a previous year.

Changes in the data collection may mean the percentage cannot actually be calculated. The contract would need to specify what would happen in such a case.

The data could be seen as government sponsored and endorsed so the product may be easier to market. Also, it could be seen as independent as less scope for the insurance company to manipulate the calculation and also less scope for manipulation by the employer.

As the statistics are based on a larger population the experience is likely to be less volatile/more predictable and hence changes materially the nature of the product.

From the employers' viewpoint the comparator is more detached from the actual experience of the participants. The product may be bought more for investment rather than protection.

This question was aimed at getting candidates to apply their knowledge in considering various aspects of an unusual product. In part (i) most students were able to show their versatility in producing the basic cashflows involved. The better candidates were able to come up with some points of further detail (e.g. timing related points, employer sick pay payments, payments to/from reinsurers), helping them to achieve high marks.
Part (ii) was not so well answered, with many candidates only suggesting a few of the possible advantages. In contrast parts (iii) and (iv) were better answered. Candidates who recognised the "all or nothing" element of this product were able to demonstrate the best understanding of the relevant issues.
In part (v) some candidates suggested controls that would certainly have improved the financial risk management for the insurer but would also have invalidated the product from a purchaser's point of view. Candidates should note that such approaches are unlikely to gain credit.
Part (vi) was less well answered; in particular, few candidates considered whether the statistics were derived from population data or from insurance companies; most candidates only considered the former.

END OF EXAMINERS' REPORT