

EXAMINATION

September 2005

Subject SA1 (South Africa) — 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

Question 1

- (i) *Note: full marks will be given for any relevant methodology of projecting the financial position by the end of the year.*

The financial position at year-end may be estimated as follows:

Collect information on actual claims paid during the calendar year.

For Option A, not all risks are included in the capitation fee. Hence, the actual capitation fee may be taken into account as an “expense” in respect of PMBs, and then issues regarding IBNR claims for Option A fall away. There are non-PMB claims under Option A for which the scheme takes risk, and the process mentioned below should be followed for such claims

All of the claims and contribution calculations below should be performed separately for each option, whereas expenses and investment returns can usually be done on a scheme wide basis.

Analyse claims run-off triangles using, for instance, the basic chain ladder method.

Determine whether any allowance should still be made, on the basis of run-off triangles, for outstanding claims from the previous year.

Perform an IBNR estimate of claims outstanding as at 31 August 2005. This should take into account seasonality, the number of claims runs per month, any changes in run-off patterns and other relevant factors. If deemed appropriate, the basic chain ladder method may be augmented by the Bornheutter-Ferguson method to make allowance for such factors.

Now estimate expected ultimate claims for September up to December 2005. This should be done with due consideration of seasonality, and taking into account membership movements over the year to date, the actual level of utilisation and actual claims inflation (i.e. claims levels in January to August relative to those in 2004) in different categories of claims (e.g. hospital, chronic medication and out-of-hospital separately).

It is also important to determine the impact of members reaching benefit limits. The actuary should consider actual claims experience with respect to the speed with which members reach benefit limits, and take a view on how many members would still reach benefit limits by the end of the year.

The actuary should also take into account any other relevant factors that may influence claims for the rest of the year, for example, changes in the price of medication due to legislation.

Having established expected claims up to the end of the year, the actuary can now look at actual expenses, and taking into account discussions with Scheme management, estimate expense levels of the rest of the year

Similarly, actual investment returns and expected investment returns for the rest of the year should also be taken into account.

Actual contribution income up to August should be determined, and added to that additional contribution income for the rest of the year taking into account the latest information on membership (i.e. not the average for the year if it is changing) as well as the trend in membership movements over the rest of the year.

Finally, the actuary should make an allowance for any other provisions, such as bad debts, on advice of the management of the scheme and by scrutiny of the management accounts.

The financial position can then be determined as:

- Accumulated funds as at 1 January 2005 (audited, but taking into account any IBNR adjustments that need to be made given more available claims information)
- + contribution income for the year
- + investment income for the year
- expenses for the year
- expected claims for the year
- + / - any other provisions
- = accumulated funds at the end of the year.

- The estimated solvency position at the end of the year would then be determined by dividing the accumulated funds by the gross contributions for the year

- (ii) There is a considerable risk of adverse membership movement.

Younger and healthier members may find it more attractive to move to other schemes, especially if a large contribution increase is required for this scheme to improve solvency.

As the pensioners are subsidised at a higher level, they are less likely to have financial pressure in seeking lower cost options or joining other medical schemes. Many of them will therefore remain in Option C.

However, as Option C has had high increases historically, there has most likely been considerable option downgrading – leaving more and more ill members behind in Option C, and also leading to a worsening risk profile in Options A and B.

Adverse selection would therefore arise from selective withdrawals and members joining other schemes, as well as option downgrading.

In addition, there is the risk of the scheme shrinking in size due to the change in subsidy policy and this will lead to more claims volatility

- (iii) The risk of worse than expected claims experience. This could be due to increases in utilisation (claim rates) or increases in the average cost of claims, or both. This is always a significant risk to a scheme, and especially so in cases where past experience may not be a good guide to future (as with large membership movements)

Adverse claims experience may be caused by the following (in addition to adverse claims experience arising from membership movements):

- adverse exchange rate movements

- change in the health status of a population (e.g. more chronic members)
- the impact of HIV / AIDS, and the progression of the epidemic
- adverse service provider behaviour, e.g. over-servicing
- fraud and / or abuse
- claim delay patterns different from expected, leading to an underestimation of IBNR, for instance

Further risks may arise from poor investment performance, which in turn may be caused by, for instance, adverse movements in asset values, which may be aggravated by an inappropriate investment portfolio. Further, the earlier realisation of assets to meet cashflow requirements may also affect investment performance, especially where a scheme is already experiencing higher than expected claims. This is a significant risk for a scheme such as this one, where the building of accumulated funds for solvency purposes should be high on the agenda.

Higher than expected expenses may be a fairly significant risk for a closed scheme with declining membership. This is especially true if some portion or all of administration is performed in-house.

Risks introduced by legislative changes, such as unexpected extensions to the PMB package may also be relevant to this scheme.

- (iv) The scheme has to hold 25% of gross contributions, and is expected to fall short of this. However, if contributions are increased to reach a higher level of solvency, gross contributions will increase and hence the solvency requirement would increase. Hence, if the scheme expects to receive R_x of gross contributions in 2006, it would have to collect $R_x / 0.75 - R_y$, where R_y is the accumulated funds at the end of 2005.

This would clearly lead to high contribution increases. The scheme should therefore discuss the situation with the Registrar, submit a business plan and obtain permission to build up solvency over a longer period, thereby relieving the pressure to have high immediate contribution increases in 2006.

However, the scheme is expecting a loss of membership, which translates into lower gross contributions in 2006, which means again that reserves may automatically be higher as a percentage of gross contributions. It would not necessarily be prudent to price for such a loss in membership though.

- (v) The scheme has a high pensioner ratio (23%), which will most likely deteriorate due to the employer actions of allowing employees to join other schemes. It is also likely that the proportion of chronic members in the scheme will increase, as it would tend to be the healthier members who leave to join other schemes.

Under the REF, the scheme would have been able to build an industry average cost of PMBs into its pricing, rather than the actual cost of providing PMB benefits. It is likely that the industry average cost would have been lower than the scheme cost, i.e. the scheme is expected to receive funds from the REF.

This would have allowed the scheme to compete on a more equal basis with the open schemes that may now attract its younger and healthier members, and hence the risks of adverse member movements would be mitigated.

However, under all three options the scheme offers benefits in addition to PMBs, and this will not be equalised. The REF protection therefore only extends to the portion of contributions covering PMB costs, and the need to build up solvency, or the offering of additional benefits, or poor investment performance or expense overruns, may still affect the competitiveness of the scheme.

Depending on exactly how and whether cross-subsidisation between options would be allowed, the low cost option may have to experience a high increase. This is especially the case given that it would now have to fund PMBs on the basis of an industry average PMB cost in the low cost option with a young and healthy profile. Again, younger and healthier members may opt out of the scheme as a result of this, but at least they would not necessarily be in a position to find significantly cheaper cover elsewhere for the same benefits.

Other implications of the REF to the scheme include:

- increased administration costs of interacting with the REF and keeping necessary records
- the solvency position of the scheme will change
- the liquidity of the scheme will change, depending on the way in which cashflows will be set up under the REF

- (vi) One of the most effective ways to reduce supplier-induced demand is through capitation, provided the entire health care delivery chain is included in the capitation arrangement (GP to Specialist to Hospital etc), that there is a system of performance-based reimbursement built in for all aspects of the health care delivery chain and provided the service provider network is wide enough to provide cover to members in the areas that they live. The scheme has already implemented this in the low cost option.

However, it may not be simple to extend such a capitation arrangement to the other two options, as members (especially higher income individuals) tend to prefer freedom of choice when choosing service providers.

The scheme may however, still introduce performance-based reimbursement for service providers (i.e. pay them higher consultation fees if they moderate their prescribing habits) even if this is not on a capitation basis.

Other forms of managing service provider induced demand are to implement a number of managed care measures, such as:

- pre-authorisation for hospitalisation, and some other expenses (e.g. MRI scans)
- treatment protocols and drug formularies, which determine, for instance, what medication a scheme would cover in full (e.g. generic medicine). If the member chooses to have more expensive medication, the scheme pays only up to the cost of the medication contained in the protocol.
- clinical audit, i.e. retrospective review of claims to identify cases of over-servicing, and then taking steps against offending service providers

- benefit design will also affect supplier-induced demand, as service provision patterns tend to differ where service providers have to collect fees from members whose benefits have run out
- disease management programmes, which looks at controlling costs for particular diseases, and chronic medication programmes will also help control supplied-induced demand
- in respect of hospitalisation, per diem and fixed fee agreements may also be used to limit the cost per episode, but may not be successful in controlling utilisation
- the use of deductibles and co-payments in benefit structuring for non-PMBs and controllable medical expenses may also reduce supplier demand for providing a particular service

- (vii) It seems clear that Option C is not sustainable, given its high average age and the level of increases that were imposed recently. This would especially be the case if it has a low number of members.

Since it will continue to require high contribution increases given the requirement that options be self-supporting, retaining the option will lead to further option downgrading over time and hence a deteriorating risk pool in the option.

The suggested new benefit structure therefore seems attractive. However, this will effectively fast-track option downgrading, as it will place all the higher risk members of Option C immediately in Options A or B. However, since the scheme would then not continue to have to pay for members with higher risks on a higher benefit option, the scheme as a whole will be better off.

To make the change more acceptable to Option C members, the benefits of Option B may be increased. This would also help to make the required increase in contributions for existing Option B members more palatable.

Since this will be a once-off adjustment, it would on balance probably be preferable to a steadily deteriorating Option C with high benefits, especially given the new subsidy policy of the employer, which would create greater impetus for option downgrading all other things being equal.

On balance the recommendation would be that the suggested strategy be implemented

Note: a well-reasoned different recommendation would also earn full marks.

- (viii) Legal requirements:
- a. The amalgamation must not be detrimental to the interests of the members of either one of the schemes
 - b. The scheme must provide a report on the transaction to the Registrar and also the results of a members' vote in respect of the amalgamation
 - c. The Registrar may ask for an independent report, and may require the scheme to send copies of the report to members, or publish details regarding the transaction.

An amalgamation with a larger scheme will probably be advantageous to the members of this scheme, and is less likely to be *detrimental* to the interests of the

large scheme (as there would be a larger risk pool) despite the relatively low solvency margin of this scheme.

It is therefore important that a large scheme with at least the same or a better solvency margin be chosen for amalgamation.

If such a scheme is found and is willing to enter into a transaction, the advantages to the members of the closed scheme would be:

- more financial security in the new scheme
- it is likely that there will be greater choice of benefit structures
- the option downgrading cycle will be discontinued, at least temporarily
- the adverse effects of the employer's change in subsidy policy would be avoided by members remaining in the scheme

However, potential disadvantages include that the large open scheme would have to carry the costs of marketing and brokers, and this will mean higher costs to members, which the closed scheme did not have to incur. In addition, these members will be a small percentage of the membership of the large scheme and as such will have considerably less control over the affairs of the large open scheme.

- (ix) Up to two thirds of the employees' total contribution may be subsidised by an employer without attracting tax in the hands of the employee.

The full employer subsidy will be tax free for Option B members. In addition, any further medical expenses that they pay out of their own pockets will be tax deductible as soon as such expenses plus their portion of the contribution (i.e. one third) exceed 5% of their income.

For Option A members, the effective employer subsidy will be more than two thirds of the contribution. This excess will be taxed at these employees' marginal rate. In addition, they may have to pay more medical expenses out of their own pockets (depending on the limitations imposed by the capitation arrangement). As soon as this, together with their portion of the contribution, exceeds 5% of income, such expenses will again be tax deductible.

For those who choose Option C, the employer subsidy will be less than two thirds and they will not be taxed on the subsidy. They will also have lower out-of-pocket expenses as they will have higher limits, and it is likely that they will be higher income individuals, which means that it is unlikely that they will be in a position to claim tax deductibility for expenses in excess of 5%.

Option A members get less tax-free income and perhaps incur higher out-of-pocket expenditure, but they still receive a higher subsidy (although not all of it will be tax deductible). Most employees will probably choose Option B, as this is what is subsidized, and only those with significant affordability constraints will choose Option A, whereas those in need of more medical services will choose Option C.

Note that Treasury has announced that the above tax rules will change by March 2006, but there is some uncertainty on exactly what the changes will be.

Question 2

- (i) It is not the actual level of these assumptions that are important, but rather the gap between them. A long term gap of 1.5% is reasonable, as medical inflation will most likely be higher than normal inflation in the long run, but a situation where medical inflation is as high as or higher than bond yields would probably not be sustainable in the long run.

The use of Government bond yields is reasonable and prescribed by AC116, given that the corporate bond market in South Africa is not deep.

It is reasonable to keep the gap consistent between the two valuations despite the drop in bond yields.

Should yields decrease significantly more, the gap may have to be reduced.

- (ii) The employer's obligation is to pay contributions only. This is especially the case as the employer has no further obligation to a large open scheme where its employees and pensioners only make up a small proportion of the overall membership. The employer has no obligation to subsidise claims, and hence there is no need to do a claims liability valuation.

However, if this liability is calculated for the purposes of disclosure under FAS106, there is strictly a requirement that a claims liability valuation has to be undertaken. However, the actuary should take advice from the auditor on whether this would be required given the fact that the employer has no liability in respect of claims.

- (iii) HIV / AIDS risk is generally regarded as negligible in respect of pensioners, and hence any calculations would have to be for actives only.

This is a small group of actives, and it will be difficult to obtain statistical significance for a group of this size.

The general impact of HIV / AIDS on a PRMA liability is as follows:

- A smaller number of members reach normal retirement, and for those HIV positive members who retire on ill-health, survival after retirement is usually not for long, and spouses also tend not to survive for many years, as it can be assumed that they would also be HIV positive. The same applies to liabilities in respect of spouses of HIV positive members who die in service. From a demographic point of view, HIV / AIDS will therefore tend to reduce a PRMA liability.
- However, the epidemic will lead to higher medical inflation in schemes, which would increase the liability. The extent of such higher medical inflation will depend on the managed care arrangements in the open medical scheme in respect of HIV / AIDS patients (given that HIV / AIDS treatment and anti-retroviral therapy is now part of PMBs), the demographics of all the members of the open scheme, as well as the level of enrolment on any HIV / AIDS disease management programme.

The impact of HIV / AIDS on this employers' PRMA liability would therefore depend significantly on infection levels in the larger membership of the scheme,

which depends on the demographic profile of all the members of the schemes. Since the actuary would not have this information at his disposal, it is probably acceptable not to take the impact of HIV / AIDS into account in the PRMA calculation, given the above reasons.

- (iv) a) The expected accrued liability at the end of a year may be calculated as follows:

Accrued Liability at start of year (L0)
Plus Service Cost (S)
Plus Interest Cost (I)
Less Expected Benefit Payments (B)

Where:

$$L0 = R59m$$

$$S = \Sigma\{TSL \times (1+d)/t\} = R2m$$

Where: d is the discount rate, TSL is the total service liability and t is the total expected service for the individual active member. The summation is over all active members.

$$I = d \times (L0 - B/2)$$

Where: d is the discount rate, L0 is the accrued liability at the start of the year
B is the post-retirement benefit payments during the year.

B can be estimated as follows:

$$200 \text{ pensioners} \times R900 \text{ subsidy} \times 6 \text{ months} = R1.08m \text{ for 2004}$$

$$200 \text{ pensioners} \times R1035 \text{ subsidy} \times 6 \text{ months} = R1.242m \text{ for 2005}$$

$$\text{Therefore } B = R2.322m - \text{say } R2.3m$$

$$\text{Hence } I = 0.112 \times (59 - (2.3/2)) = R6.479m, \text{ or } R6.5m$$

The expected accrued liability is therefore:

$$\begin{aligned} L1 &= L0 + S + I - B \\ &= 59 + 2 + 6.5 - 2.3 \\ &= R65.2m \end{aligned}$$

- b) The actuarial gain is the expected accrued liability minus the actual accrued liability. Given that the actual liability was determined as R65m, the actuarial gain was R0.2m.