

Actuarial Society of South Africa

MARKING SCHEDULE

OCTOBER 2018

Subject F201- South African 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 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 consider the possibility that circumstances may have changed if using these reports for revision.

General comments on the aims of this subject and how it is marked

1. The aim of the Health and Care Specialist Applications subject is to instil in the successful candidates the ability to apply knowledge of South African health and care environment and the principles of actuarial practice to the provision of health and care benefits in South Africa.
2. 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 tangential points 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.
3. It is often helpful to use subheadings when answering long part questions.
4. Candidates who give well-reasoned points, not made in the marking schedule, are awarded marks for doing so and these marks were added to the marking schedule.

General comments on student performance in this session of the examination.

The difficulty of the paper was consistent with papers set for recent sessions. Well prepared candidates scored well across most of the paper, particularly Question Two. Question One required a focus on technical elements on the syllabus that are covered across various chapters. Candidates generally struggled to demonstrate an understanding of the concepts and the application to the examples given. Candidates did not score as well as they could have with the bookwork questions.

The comments on the questions below concentrate on areas where candidates could have improved their performance.

Basic examination techniques of answering the question, labelling and sign posting showed some improvement compared to the last session however candidates can improve further here by following basic instructions.

QUESTION 1**Question 1(i)**

The question asked candidates to use bookwork knowledge about the liabilities of a medical scheme to describe the differences between in hospital and out of hospital benefits. Most candidates gave limited information about each set of liabilities with very few performing meaningful comparisons.

Candidates generally displayed limited bookwork knowledge about this topic (even though the course notes include a similar question and detailed solution), missing key points or making unnecessary generalisations that did not answer the question.

Candidates that scored better were able to address all aspects of question, demonstrating a clear understanding of in hospital and out of hospital liabilities and how they differ.

In-Hospital Benefits can be defined as all goods and services utilised while the patient was admitted into the hospital, including the hospital facilities, GPs, specialists, prosthesis, medications, surgicals, and surgical appliances.

However, this is also sometimes used to refer to the fees related only to the hospital use, e.g. hospital facilities and nursing staff, i.e. excluding associated costs such as GPs and specialists.

While Out-of-Hospital Benefits include all goods and services utilised while the patient is not admitted into a hospital, e.g. GP and specialist consultations, medication, optometry examinations, dentistry examinations, preventative screening tests.

Term

Medical scheme liabilities relate to:

- Claims incurred but not yet reported
- Claims that have been reported but not yet paid

In terms of regulations to the Medical Schemes Act, a valid claim must be paid within 30 days of receipt of claim, within 4 months of date of service...

...thus, the majority of out-of-hospital claims are short term...

...while in-hospital claims might have a longer term to settle.

Incidence of the claim could be longer starting from the time of the pre-authorisation of the claim with the liability notionally accruing over the duration of the admission.

Pre-authorisation process generally aims to establish the intended length of stay and overall cost of the hospital event. However this may be more or less depending on the actual experience and could therefore increase or reduce the eventual bill received.

The duration in hospital is unlikely to impact the time taken to pay the invoice on presentation unless there are specific auditing or review processes that still need to be completed. This is likely to affect larger claims.

Nature

(In- and Out-of-) Hospital claims liabilities relate to claims that have been incurred but not yet reported.

The pre-authorisation process for in-hospital claims provides an element of interim reporting on the claim amount to be expected.

The claim amounts can be regarded as fixed monetary liabilities unless there are capitation arrangements in place.

Capitation arrangements are unlikely to be in place for in-hospital benefits. However, there may be other alternative reimbursement arrangements in place such as fixed fees, global or per diems.

To the extent that the hospitals contract with the medical scheme on alternative reimbursement arrangements the extent to which the monetary liabilities are fixed and determinable upfront increases as the level of risk transfer increases.

Uncertainty of amount

The incidence and severity of the claim amounts are unknown, depending again on the extent to which alternative reimbursement arrangements are in place and the risk transfer involved.

More risk transfer results in less uncertainty of either the incidence or the severity or both depending on the actual arrangement in place.

Severity of claims depends on procedure, diagnosis, duration in hospital, medical / surgical, level of acuity etc.

Frequency depends on the number of admissions and re-admissions. Poor quality of care may result in higher rates of re-admissions which increases claim frequency.

If the medical scheme is large, the claims fluctuations may be less volatile compared to a small scheme particularly for hospitalisation claims which tend to be the larger claims within a medical scheme.

However, in-hospital claims are likely to be more variable than stable claim categories such as chronic medication.

Currency

Most of the claim costs will be in ZAR.

Hospital claims incurred under international travel benefits may be paid in foreign currency depending on the benefits and rules of the Scheme. This is likely to constitute a very small proportion of total hospital claims and an even smaller proportion of total claims.

Medical schemes do have exposure to currency risk due to the cost of medical equipment, surgicals and other medical costs that are imported due to fluctuating exchange rates.

[Total 8]

Question 1(ii)

The question required candidates to explain information presented in the form of a graph which contained clear illustration of the changes in development factors by development month for in hospital and out of hospital claims.

Explicit reference to (five) elements of the graph were given in the question that candidates were expected to refer to in their explanations. Despite the clear sign posting of the question, candidates did not always cover all the elements requested or failed to provide sufficient information for each. Very few candidates were able to speak to methodology which reflected poor bookwork knowledge. Candidates were not expected to recreate the graph or reframe the information.

The aim for this question was to balance bookwork and application to this specific scenario.

The graph depicts the development factors of MIMS for two benefit years, separately for In-Hospital and Out-of-Hospital claims, over the various development months. A clear change in pattern is noted from 2017 to 2018, indicating that claims are being paid/processed faster for both benefit types.

A development factor shows the expected increase in the claims paid thus far from one development month to the next.

For example, the development factor in 2017 is 5 for In-Hospital claims in the first development month, i.e. development month 0. This means that the In-Hospital claims paid within the first development month (or within the same month of service) of 2017, is estimated to increase by a factor of 5 in the following development month.

Such development factors/patterns are required to estimate the Outstanding Claims Provision – using methods such as the chain ladder method, the Bornhuetter-Ferguson method or the Bootstrap method:

- A chain ladder method is defined as using development ratios that are weighted by the cumulative claims values from which they arise. The basic chain ladder method is usually defined to apply to unadjusted paid claims using a treatment or service month cohort.
- The Bornhuetter-Ferguson method combines the estimated loss ratio with a projection method (usually the basic chain ladder). It therefore improves on the crude use of a loss ratio by taking account of the information provided by the latest development pattern of claims, while the addition of the loss ratio to a projection method serves to add some stability against distortions in the development pattern.
- In a reserving context, bootstrapping can be used to provide information about the IBNR reserve, such as an estimate of its variance. Bootstrapping can be used to provide an indication of the extent to which the IBNR reserve varies on either side of this expected value.

Outstanding Claims are usually defined to include:

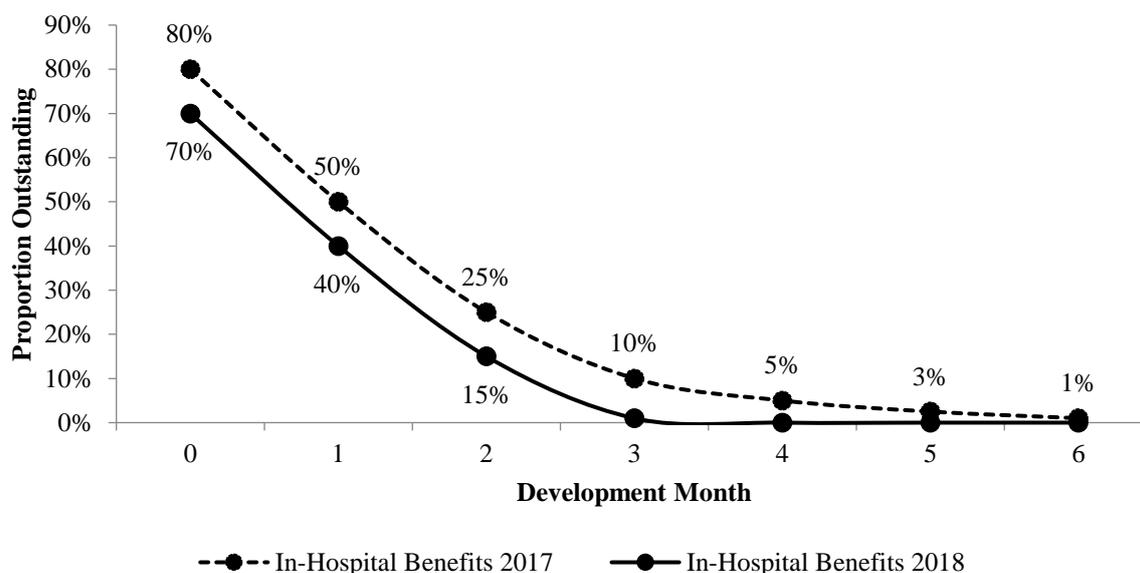
- Claims that have been reported and have not yet been settled or not yet approved for payment (claims creditor), and
- Claims which have been incurred but not yet reported (IBNR).

IBNR is defined to be the liability for future payments on claims which have already occurred but have not yet been reported in the medical scheme's records. Sources of these unreported claim payments include unknown, unreported claims, and/or closed claims that will later become reopened and have additional payments.

Development factors can also be converted into a series of estimated proportions outstanding or paid over the development months. E.g. development factor of 5 is synonymous with a proportion paid of 20% ($=1 / 5$) and a proportion outstanding of 80% ($=1 - 1 / 5$).

Converting the development factors for In-Hospital claims into a series of proportions outstanding, the change from 2017 to 2018 is perhaps more intuitive: in 2017 80% of claims were considered outstanding, but in 2018 this proportion reduced by 10 percentage points. This emphasises the significant change in the speed of claims processing/payments.

The graph below illustrates the last paragraph – candidates are not expected to produce this:



During this audit process, the reviewing actuary and Audit Partner would need to establish whether the change in development pattern is a true reflection of reality, or whether it was influenced by volatility in the data:

- If this is a true reflection of reality, the reason for this change needs to be explored and proven, e.g. was there a change in administration platform that could process and pay claims faster, or did MIMS increase the number of payment runs in a month, or was there a major shift from paper claim submissions to electronic claim submissions.

- If this was influenced by volatility in the data, the statistical profile needs to be explored, e.g. check the size of MIMS, or how historic development factors have fluctuated in the past.

The last mentioned might necessitate the need for a longer lag in determination of the development factors.

[Total 7]

Question 1(iii)

This question required candidates to think about the various checks that they would perform if they were doing a peer review of the outstanding claims provision calculation and translate that into questions to ask. The question was relatively well answered with many candidates producing many points to execute on the request, while at the same time balancing these with the objective of the question.

Clarification on the significant change in the development factors e.g. was there a change in administration platform that could process and pay claims faster...

...or did MIMS increase the number of payment runs in a month, or was there a major shift from paper claim submissions to electronic claim submissions.

...Or was this was influenced by volatility in the data.

Confirmation whether the drop in development factors was the driver of the decrease in the Outstanding Claims Provision...

...and if not, clarification of what the driver of the Outstanding Claims Provision was.

The valuation report to supplement the Outstanding Claims Provision valuation results.

Confirmation whether APN 304 was used as a guideline to perform this valuation as this would provide comfort from an auditing perspective that sufficient expertise and professional standards were applied in producing these results.

Qualifications of the Healthcare Actuary as his/her FASSA Certificate and Healthcare Practicing Certificate should provide adequate comfort/proof that this person is sufficiently qualified to perform this valuation.

The description of the data sources used and confirmation that there were no significant changes since the previous year (this is also required by APN 304).

A summary of the validations conducted, and the outcome of these validations to provide comfort that the Healthcare Actuary performed sufficient testing to ascertain the reasonableness of results (this is also required by APN 304)

A list of the assumptions used, the reasoning behind these and how these were set to gain comfort that the main drivers of the valuation results are reasonable (this is also required by APN 304).

An explanation of how and why deviations in the assumptions and/or data were or were not allowed for ascertaining the appropriateness of manual adjustments (this is also required by APN 304).

The methodology used, including any changes that have occurred since the previous valuation (this is also required by APN 304).

The reasoning behind process and method chosen as well as a breakdown of the quantification of results (this is also required by APN 304).

The details around the sensitivity analysis performed and confirmation that the direction and magnitude of the sensitivities are reasonable (this is also required by APN 304).

Any aspects that are material to the interpretation of the IBNR valuation, e.g. manual adjustments made (this is also required by APN 304).

Confirmation whether a retrospective review was performed, and if so, a description of the stability in results (this is also required by APN 304)

Request to receive the same detailed claims data the actuary used in order for the reviewing Actuary to perform an independent recalculation and assess whether the same development factors can be derived.

Justification of the benefit categories used as a split by In-Hospital and Out-of-Hospital Benefits might not be sufficient to achieve homogeneity, but if MIMS is small it might be justified to maintain credibility.

Confirmation that the valuation was performed separately for each benefit option to allow for the different benefit structures.

Confirmation that data credibility was considered.

Confirmation that seasonality was considered.

Confirmation that Potential Re-opened/Adjusted Claims were taken into account.

Confirmation that Membership size and changes therein was considered.

Confirmation that Contractual arrangements (if applicable) were considered.

[Total 8]

Question 1(iv)

Question 1 parts (iv) and (v) related to the impact of the Value Added Tax increase that was implemented during 2018.

Given that this change actually occurred and impacted all medical schemes and healthcare stakeholders, candidates answered the question more poorly than expected. The question contained sufficient information for candidates to be able to apply the concept independently and reason their way through it.

Candidates generally struggled to distinguish the various elements of the income statement and how each of these may differ with regards to VAT and where expected to give reasonable explanations for which parts of the income statement should be considered in this context. Many candidates also did not adequately take note of the timing of the VAT increase and its impact being less than a full year on the 2018 experience.

Check that Ultimate Claims increase by 0.88% in April 2018, or by 0.66% on an annual basis

The VAT increase will have a direct impact on the total ultimate claims (and therefore the Outstanding Claims Provision) with effect from 1 April 2018 by 0.88% ($= 1.15 / 1.14 - 1$).

However, on the annualised figures the VAT increase would only impact nine months of the full benefit year (i.e. April to December 2018). Therefore, the impact on the total benefit year is estimated to be $\frac{3}{4}$ of the 0.88% impact, i.e. 0.66%.

A check that can therefore be performed is to analyse whether the estimated ultimate claims (excluding the effect of seasonality) is approximately 0.88% higher in April, or 0.66% on annual basis.

However, the full 0.66% increase in claims might not be realised as there are a few factors that might reduce this impact, e.g. claims with limits where the limits do not increase accordingly, certain tariffs not increasing, etc.

Check for a change in seasonality as the claim limits will be reached faster

For the claims where limits apply, the usual seasonal trend would show a declining trend in claims throughout the benefit year as the limits are being reached.

Assuming the limits would not accordingly increase with the VAT change, members would reach their limits even faster as the claim amounts will increase accordingly with the VAT increase, reducing their buying power.

This would affect the seasonality patterns, showing a faster declining trend in claims (where limits apply) throughout the benefit year.

For example, day-to-day benefits.

Check that only the relevant tariffs increase with VAT

There might be certain tariffs or benefit categories that will not increase with VAT...

...such as non-negotiated tariffs as the tariffs would have been quoted inclusive of VAT without the right to change the tariff in the event of a VAT increase.

In terms of negotiated tariffs or tariffs related to contractual arrangements, a great deal will depend on the nature of the contracts/agreements that have been signed with these providers as to whether a VAT increase would be allowed.

In terms of the analysis, split the (ultimate) claims data according to the various benefit categories, determine which categories would increase with VAT and which ones won't, and then perform a check that the VAT increase was allowed for appropriately for each category.

Check for an additional delay in claim submissions up until April 2018

If it is expected that healthcare providers might act fraudulently and take advantage of the VAT increase, they might submit claims (for services incurred prior to 1 April 2018) to MIMS only in April to be allowed to include the new 15% VAT rate.

Such an investigation would have to be performed on a granular level (e.g. GPs, specialists, hospitals separately)...

...and the development factors would have to be compared before and after the VAT increase announcement.

The expected trend would be a "normal/usual" development pattern before the VAT announcement, followed by additional delays after the VAT announcement but before April 2018, and then a reversion back to a "normal/usual" development pattern after April 2018.

[Total 6]

Question 1(v)**Income Statement**

Contributions will remain the same as medical schemes are not registered VAT vendors and VAT can therefore not be levied on contributions.

The total ultimate claims will increase with 0.88% from 1 April 2018...

...but this depends if the Rand amount limits also increase with 0.88%...

...and if the Board of Trustees agree to increase the non-negotiated tariffs where these tariffs are quoted inclusive of VAT...

...otherwise the impact would be diluted and be less than a 0.88% increase in claims.

Capitation fees will increase by 0.88%, if allowed by the Trustees of MIMS, depending on whether the fee is VAT inclusive.

Non-healthcare expenses (such as admin and managed care fees) are typically quoted excluding VAT, so these will increase directly with 0.88%.

As the VAT increase only impacts expenses and not income, MIMS' bottom line would be worse off than before the VAT change.

Members

Members will not be affected in the 2018 benefit year by an increase in contributions as medical schemes are not registered VAT vendors and VAT can therefore not be levied on contributions.

Where benefits are funded from the Medical Savings Account, the VAT impact is passed onto the members, reflecting their reduced buying power. The Savings Account is now likely to be depleted faster.

Where benefits are capped by an annual limit, the VAT increase will impact the members by reaching these limits faster, and therefore members could face out-of-pocket expenses when these limits have been reached.

Members might be affected in the following benefit year in the form of a higher contribution increase in order for MIMS to recoup the impact of the VAT absorbed during the 2018 benefit year.

[Total 4]

Question 1(vi)

Question 1 parts (vi) and (vii) asked candidates to assist the Audit Partner by considering various courses of action that the scheme could take given the situation set out in the question. This required candidates to consider the situations and give reasoned explanations how the scheme could potentially proceed. The questions expected candidates to demonstrate an understanding of stakeholders involved or impacted by these courses of action, particularly for part (vii). Candidates generally attempted these questions reasonably well, although candidates could have scored more marks here by covering a wider ground for each course of action, and stakeholder where applicable.

These courses of actions relate to a turn-around strategy to avoid MIMS reaching insolvency:

Implement higher future contribution increases (such that at least breakeven position is achieved before investment income)...

...which would cause an initial drop in the solvency position (as the denominator increases), but an improved probability to build reserves and grow solvency in the medium to longer term...

...but this may not be a competitive move as this could encourage members to downgrade to more affordable options or even exit MIMS – especially as the remaining risk profile is worse than before the large participating employer left.

Implement an aggressive marketing strategy to attract more young and healthy lives – especially as the loss of the large pool of young and healthy members is potentially the reason why a turn-around strategy is required in the first place...

...Although membership growth reduced the solvency position, the reduction may be hindered if growing with young and healthy members as they tend to join the least comprehensive benefit options with low contribution rates. ..

...These members are also more likely to be reserve-building members as they have a low claiming behaviour.

...However, a more aggressive marketing strategy might come at an additional marketing cost, increasing non-healthcare expenses that could eat into the reserves if the options are loss making (or reduce the reserve building potential if the options are surplus-making).

...Also, MIMS being an industry medical scheme for the mining industry, would already have the majority of employees in the mining industry, restricting the pool of potential new members, but this will depend on the involvement of the participating employers encouraging their employees to belong to MIMS.

Reduce healthcare expenditure through means such as managed care, and provider contracting...

...but the positive impact of these initiatives might only realise in the longer-term, and therefore the solvency won't be improved in the near future.

Reduce benefit richness by either introducing/lowering benefit limits...

...or introducing/increasing co-payments...

...but this may not be a competitive move as this could encourage members to downgrade to more affordable options or even exit MIMS.

Merge benefit options with one another where this is sensible, e.g. post-merge the net effect is positive for the scheme in terms of membership size and financial results...

...this might be a likely course of action given that MIMS has “multiple benefit options” and there could be options that have benefit designs that do not deviate too far from one another, but this would have to be confirmed with a detailed benefit schedule review.

...The intention is to merge a loss-making benefit option with a surplus-making benefit option such that the merged option is surplus-making and contributing to the reserves, to improve the solvency position.

Apply for an exemption from PMB provision for certain benefit option(s) to reduce claims cost and resulting contributions significantly and attract new reserve-building members.

...the reduced contributions would reduce the solvency requirement.

...but such an exemption is unlikely to be obtained (perhaps with a very strong argument that individuals could otherwise lose healthcare coverage) and mostly only applies to the previous Bargaining Councils.

Introduce an efficiency discounted option to reduce claims cost (by means of provider efficiency) and attract new members who would not mind compromising their freedom of healthcare provider choice.

...the solvency requirement is reduced by the lower average contribution rate and the lower claims cost.

...but efficiency discounted options hardly work well in a restricted medical scheme environment given that it relies on the principle to attract new, young and healthy lives which is not as possible as with an open medical scheme environment...

...but MIMS being an industry medical scheme (as opposed to a corporate medical scheme) could have the potential to attract more members in the mining industry if these employees are currently uncovered or a member of an open medical scheme.

[Total 5]

Question 1(vii)

Assuming insolvency is inevitable, no turn-around strategy would seem viable, and MIMS would have to dissolve or amalgamate as soon as possible to still be in the best interest of members.

Course of action 1: Dissolve / Liquidate

Liquidate MIMS while there are sufficient reserves...

...and distribute reserves equitably amongst members...

...leaving members free to join any open medical scheme (and subject to underwriting).

Impact on / Implications for members

Members could be fairly (or unfairly) compensated for the closure of their medical scheme, and use these funds to cover any healthcare expenditure while being uncovered before joining a new open medical scheme (or during the general waiting period after joining a new open medical scheme.)

The extent to which this is possible would depend on the amount of distributed reserves per member, which further depends on the timing of liquidation.

Members could be unable to find an open medical scheme (option) with a similar level of benefit offering and affordability. Especially as these members could always have relied on their employer to recommend a suitable benefit option on MIMS, the members' awareness and education of wider medical scheme coverage might not be sufficient/advanced.

Members with chronic conditions would be burdened with the process to register for a new medical scheme's chronic risk management programme.

Impact on / Implications for the board of trustees and principal officer

Upon the closure/liquidation of MIMS, the board of trustees' and principal officer's employment (in capacity as trustees) will be terminated. Those trustees who acted in such a capacity on a full time basis would no longer have employment, and would have to explore other employment opportunities.

Impact on / Implications for the employer

Should the employers in the mining industry make it a condition of employment to belong to a medical scheme, the employers will be burdened with the administration of enforcing and recording all employees' chosen open medical schemes.

Should the employers in the mining industry make medical scheme coverage optional for the employees, some employees could opt out of medical scheme coverage upon the closure of MIMS and not proceed to join an open medical scheme. Should these uncovered employees ever be in need of healthcare (without medical scheme coverage), the employers might

experience increased absenteeism as employees do not seek healthcare to recover and return to work.

Given that the scheme is an industry scheme, there may be employer representation on the board of trustees. On liquidation of the scheme, these employer (or member elected) trustees will no longer need to fulfil this function thus freeing up this time for the employer.

Impact on / Implications for the State

The employees who choose to opt out of medical scheme coverage upon the closure of MIMS and do not proceed to join an open medical scheme could rely on public hospitals for their healthcare needs, increasing the burden on the State.

Course of action 2: Amalgamate

Amalgamate before reaching the point of unsustainability...

...such that MIMS is still deemed attractive enough as an amalgamating partner...

...and such that underwriting could be waived for the MIMS members post-amalgamation.

Impact on / Implications for MIMS members

The MIMS members would enjoy continued medical scheme coverage.

However, the level of benefit offering and affordability might be different (worse off or better off), depending on the post-amalgamation benefit design and the demographic profile of the amalgamating partner.

Members with chronic conditions could experience a smooth transitional process to register for the amalgamated medical scheme's chronic risk management programme.

Impact on / Implications for the board of trustees and principal officer

The board of trustees and principal officer could have the opportunity to join the board of the amalgamated medical scheme, enjoying continued employment in a current (or revised) capacity.

The board of trustees' and principal officer's employment (in capacity as trustees) could also be terminated. Those trustees who acted in such a capacity on a full time basis could no longer have employment, and would have to explore other employment opportunities.

Impact on / Implications for the employer

The employer would not experience any increased absenteeism as all current MIMS members will enjoy continued medical scheme coverage.

There may however be increased administration requirements for the time during which the amalgamation is being finalised and members are on-boarded onto the 'new' scheme.

Impact on / Implications for the members of the amalgamating partner

The members of the amalgamating medical scheme could be worse off if MIMS' demographic profile (in terms of age and chronic burden) is worse, increasing the expected average claims cost which will require higher contribution increases.

The converse could also apply if MIMS' has a better demographic profile, improving the overall risk pool's demographic profile and cross-subsidisation ability.

Such an amalgamation would only be possible if it is in the best interests of all members, i.e. for the members of both MIMS and the amalgamating partner.

[Total 4]

Question 1(viii)

For this question, the Rand amount subsidy proposed was not given, so candidates were expected to consider whether the Rand amount was higher or lower than the percentage subsidy and reason accordingly. Again, the question asked candidates to consider the main stakeholders stakeholders. This was to test the understanding of which parties are responsible for which elements of the subsidy promise and how this is managed in support of the funding.

Employees of large Mining Employer

The attractiveness of the PRMA benefit would reduce in the eyes of eligible employees, and therefore at retirement eligible employees would feel less tied to MIMS and would be open to consider membership of other open medical schemes

The employees may feel less incentivised or ambitious to remain employed by the very large mining employer, and may even consider other employment before reaching retirement...

...However, this would depend on the medical scheme subsidy during employment rather than the PRMA subsidy...

...But this is likely to be on a cost-to-company basis which is quite standard in the industry.

This will also depend on whether MIMS has benefit options with salary bands, as this will determine their contribution rate during retirement...

...which is likely to be lower post-retirement compared to pre-retirement...

In addition, if the fixed Rand amount subsidy is lower than the subsidised contribution amount, then those members would value the PRMA benefit less...

...But the converse applies if the fixed Rand amount subsidy is higher than the current subsidised contribution amount.

Large Mining Employer

The employer might experience increased resignation rates or even increased early retirement rates...

...depending on the conditions stipulated in the subsidy policy.

For example, the subsidy policy may stipulate that the PRMA benefit does not pay upon early retirement.

The employer may further struggle with recruitment as one attractive employee benefit has reduced...

...But the PRMA liability should reduce depending on the level of the Rand amount subsidy chosen

As there are multiple benefit options, the employees seeing a reduction in value would be those where the current subsidy is higher than the newly proposed Rand amount subsidy...

...while the employees on the more comprehensive options would experience a reduction in subsidy where the newly proposed rand amount subsidy is less than the subsidy they were eligible for under the % structure

Also, while the PRMA liability was driven by a high HCCI assumption, it will now be driven by a general inflation assumption, which should reduce the liability.

MIMS

As the participating Mining employer is very large, it can be assumed that the MIMS membership predominantly consists of members employed by this specific employer...

..Therefore, if most of the newly retired individuals opt out of the subsidy, there is risk that many of these members would leave for other open schemes...

...Which would reduce the pensioner ratio for MIMS, as well as the average age...

Which should reduce the average claim amount per member per month...

...with knock-on positive effects on the bottom line.

This could also improve solvency due to the denominator becoming smaller.

However, this subsidy could also prompt downgrades as the PRMA benefit only has value on the lower-end benefit options.

[Total 6]

Question 1(ix)

Candidates were presented with an example of a valuation report containing valuation assumptions and results. Candidates were asked to assess by general reasoning or otherwise the credibility (or accuracy or reasonability) of the results. This meant that candidates were not expected to recreate (all) the numbers, however numerical answers are provided in the solutions. Only a few candidates showed a calculation. This was consistent with the expectation for the question that candidates would use general reasoning.

Very few of those who attempted the question provided reasonable and sensible explanations for how the change in assumptions impacted the calculations and results or the changes in the liability components from one year to the next. Candidates demonstrated very poor understanding of the mechanics of a liability calculation and the influences of the underlying assumptions on the results. Candidates also struggled to make sense of the results including the balancing items which were all covered in the notes.

The solution provided contains a detailed explanation how to approach this question; however, candidates were not required to produce all this detail in order to gain full marks on the question. Candidates are strongly encouraged to work through this question to assist in realising understanding of the liability methodology.

Liability brought forward as at 1 January 2018

Comparing this value of R 3.6 billion to the future values of this liability (R 4.07 billion and R 4.165 billion), the change is not too excessive to raise concern – especially as the number of lives covered and the assumptions appear to be relatively stable.

This value can be checked for reasonability as follows:

$$\begin{aligned}
 & (\#Members_{2017}) \times (Subsidy_{2017}) \times \left(\frac{Ave PS_{2017}}{Ave TS_{2017}} \right) \times 12 \times a_{NRA} \\
 & \quad \times \left(\frac{1 + HCCI_{2017}}{1 + DR_{2017}} \right)^{Ave TS_{2017} - Ave PS_{2017}} \times (p_x)^{Ave TS_{2017} - Ave PS_{2017}} \\
 & = (9\,600) \times (85\%) \times (R\,3\,000) \times \left(\frac{29}{38} \right) \times 12 \times 15 \times \left(\frac{1 + 8.5\%}{1 + 7.5\%} \right)^{38-29} \\
 & \quad \times (1 - 0.006)^{38-29} \\
 & = R\,3.462 \text{ billion}
 \end{aligned}$$

This value only differs by -3.8% from the value provided (R 3.6 billion) and is therefore reasonable based on this high-level check.

Subsidy Payments during 2018

The sign of this figure (i.e. negative) seems reasonable as a subsidy payment should extinguish a part of the liability.

The magnitude of this value can be checked for reasonability as follows:

$$\begin{aligned} & -(\#Members_{2017}) \times (Subsidy_{2017}) \times 12 \\ & = -(9\,600) \times (85\%) \times (R\,3\,000) \times 12 \\ & = -R\,294\,million \end{aligned}$$

This value only differs by -0.4% from the value provided (R 295 million) and is therefore reasonable based on this high-level check.

Service Cost during 2018

The sign of this figure (i.e. positive) seems reasonable as this represents the unwinding of the PUCM factor, representing an increased accrual to the full discounted liability due to an increase of one past service year.

The magnitude of this value can be checked for reasonability as follows:

$$\begin{aligned} & (PRMA\ liability_{1\ Jan\ 2018}) \times \frac{1}{(Ave\ Past\ Service\ Years_{2017})} \times (1 + DR_{2017}) \\ & = (R\,3\,600) \times \frac{1}{(29)} \times (1 + 7.5\%) \\ & = R\,133\,million \end{aligned}$$

...assuming the PRMA liability as at 1 January 2018 is reasonable (which was demonstrated above).

This value only differs by -1.1% from the value provided and is therefore reasonable.

Interest Cost during 2018

The sign of this figure (i.e. positive) seems reasonable as this represents the unwinding of the discount rate, which increases the liability as all the future cash flows are discounted less for 1 year.

The magnitude of this value can be checked for reasonability as follows:

$$\begin{aligned} & (\text{Discount Rate}) \times \left((\text{PRMA liability}_{1 \text{ Jan } 2018}) - \frac{(\text{Paid Subsidies})}{2} \right) \\ &= (7.5\%) \times \left((R 3\,600) - \frac{(R 295)}{2} \right) \\ &= R 259 \text{ million} \end{aligned}$$

Assuming the PRMA liability as at 1 January 2018 and Paid Subsidies during 2018 are reasonable (which were demonstrated above).

This reasonability check also assumes that subsidies are paid uniformly throughout the year.

This value only differs by -0.4% from the value provided and is therefore reasonable.

Actuarial (Gain)/Loss during 2018

This item is negative, but should be positive to indicate an actuarial loss and to ensure the liability as at 31 December 2018 reconciles.

The actuarial loss implies that liability was understated at the previous valuation, and this actuarial loss corrects the liability value.

It could be checked that all the sub-components add up:

$$\begin{aligned} & (\text{Actual vs Expected Contributions}) + (\text{Change in Discount Rate}) \\ & \quad + (\text{Change in Healthcare Cost Inflation}) + (\text{Demographic changes}) \\ &= (R 20) + (R 190) + (R 190) + (-30) \\ &= R 370 \text{ million} \end{aligned}$$

This value matches the value provided exactly and therefore appears to be reasonable.

In addition, it can be checked whether this amount serves as a correct reconciling item, as follows:

$$\begin{aligned}
 & (PRMA\ liability_{31\ Dec\ 2018}) \\
 & \quad - [(PRMA\ liability_{1\ Jan\ 2018}) + (Paid\ Subsidies) + (Service\ Cost) \\
 & \quad \quad + (Interest\ Cost)] \\
 & = (R\ 4\ 070) - [(R\ 3\ 600) + (-R\ 295) + (R\ 135) + (R\ 260)] \\
 & = R\ 370\ million
 \end{aligned}$$

This value matches the value provided exactly and therefore appears to be reasonable.

Actual vs Expected Contributions during 2018

A positive number here indicates that the contributions were underestimated, i.e. the actual contribution increase was higher than that expected.

This value can be checked for reasonability as follows:

$$\begin{aligned}
 & [(Actual\ Average\ Contribution\ Increase_{2018}) - (Healthcare\ Cost\ Inflation_{2017})] \\
 & \quad \times [(PRMA\ liability_{1\ Jan\ 2018}) + (Paid\ Subsidies) + (Service\ Cost) \\
 & \quad \quad + (Interest\ Cost)] \\
 & = [(9.0\%) - (8.5\%)] \times [(R\ 3\ 600) + (-R\ 295) + (R\ 135) + (R\ 260)] \\
 & = R\ 19\ million
 \end{aligned}$$

This value differs by -7.5% from the value provided and is therefore a material difference – this needs to be investigated further (based on unrounded calculation).

Change in Discount Rate during 2018

A positive number here indicates that the discount rate was decreased from one valuation to the next, increasing the PRMA liability, which is the case given the information provided (the discount rate decreased from 7.5% to 7.0%).

This value can be checked for reasonability as follows:

$$\begin{aligned}
 & [(Discount\ Rate_{2017}) - (Discount\ Rate_{2018})] \times (Discounted\ Mean\ Term_{2017}) \\
 & \quad \times [(PRMA\ liability_{1\ Jan\ 2018}) + (Paid\ Subsidies) + (Service\ Cost) \\
 & \quad \quad + (Interest\ Cost)] \\
 & = [(7.5\%) - (7.0\%)] \times (10) \times [(R\ 3\ 600) + (-R\ 295) + (R\ 135) + (R\ 260)] \\
 & = R\ 185\ million
 \end{aligned}$$

This value only differs by -2.6% from the value provided and is therefore reasonable.

Change in Healthcare Cost Inflation during 2018

A positive number here indicates that the healthcare cost inflation assumption was increased from one valuation to the next, increasing the PRMA liability, which is the case given the information provided (the healthcare cost inflation rate increased from 8.5% to 9.0%).

This value can be checked for reasonability as follows:

$$\begin{aligned}
 & [(Healthcare\ Cost\ Inflation_{2018}) - (Healthcare\ Cost\ Inflation_{2017})] \\
 & \quad \times (Discounted\ Mean\ Term_{2017}) \\
 & \quad \times [(PRMA\ liability_{1\ Jan\ 2018}) + (Paid\ Subsidies) + (Service\ Cost) \\
 & \quad + (Interest\ Cost)] \\
 & = [(9.0\%) - (8.5\%)] \times (10) \times [(R\ 3\ 600) + (-R\ 295) + (R\ 135) + (R\ 260)] \\
 & = R\ 185\ million
 \end{aligned}$$

This value only differs by -2.6% from the value provided and is therefore reasonable.

Demographic changes during 2018

A negative number here indicates that the changes to the demographic profile (i.e. number of active employees – driven by the attrition rates) was overstated.

The actual number of withdrawals from 2017 to 2018 was 50 (9 600 - 9 550), while the expected number of withdrawals was 58 (0.006 × 9600).

This implies that less employees left than expected. This should translate into an understatement of the PRMA liability, and therefore the actuarial loss should adjust the liability upwards to correct for this effect.

This is in contrast with the negative number (i.e. gain) and therefore this seems incorrect, and should be investigated further.

This value can be checked for reasonability as follows:

$$\begin{aligned}
 & \left[\left(\frac{(\#Members_{2017}) - (\#Members_{2018})}{(\#Members_{2017})} \right) - (Attrition\ Rate)_{2017} \right] \\
 & \quad \times (Discounted\ Mean\ Term_{2017}) \\
 & \quad \times [(PRMA\ liability_{1\ Jan\ 2018}) + (Paid\ Subsidies) + (Service\ Cost) \\
 & \quad + (Interest\ Cost)] \\
 & = \left[\left(\frac{(9\ 600) - (9\ 550)}{(9\ 600)} \right) - 0.006 \right] \times (10) \\
 & \quad \times [(R\ 3\ 600) + (-R\ 295) + (R\ 135) + (R\ 260)] \\
 & = -R\ 29\ million
 \end{aligned}$$

This value only differs by -2.4% from the value provided and is therefore reasonable.

Liability as at 31 December 2018 / Liability brought forward as at 1 January 2019

Comparing this value (R 4.070 billion) to that of the previous year (R 3.6 billion), the increase can be explained by the reduction in the discount rate, the increase in the average contribution rate pmpm, and the increase in the healthcare cost inflation.

The liability could have been higher had the total number of active employees not dropped by 50 lives.

Firstly, it could be checked that all the components add up:

$$\begin{aligned} & (\text{PRMA liability}_{1 \text{ Jan } 2018}) + (\text{Paid Subsidies}) + (\text{Service Cost}) + (\text{Interest Cost}) \\ & \quad + (\text{Actuarial Loss}) \\ & = (R\ 3\ 600) + (-R\ 295) + (R\ 135) + (R\ 260) + (R\ 370) \\ & = R\ 4.070 \text{ billion} \end{aligned}$$

This value matches the value provided exactly and therefore appears to be reasonable.

In addition, it can be checked also be checked as follows:

$$\begin{aligned} & (\#Members) \times (\text{Subsidy}) \times \left(\frac{\text{Ave PS}}{\text{Ave TS}} \right) \times 12 \times a_{NRA} \times \left(\frac{1 + HCCI}{1 + DR} \right)^{\text{Ave TS} - \text{Ave PS}} \\ & \quad \times (p_x)^{\text{Ave TS} - \text{Ave PS}} \\ & = (9\ 550) \times (85\%) \times (R\ 3\ 270) \times \left(\frac{30}{38} \right) \times 12 \times 14 \times \left(\frac{1 + 9.0\%}{1 + 7.0\%} \right)^{38-30} \\ & \quad \times (1 - 0.005)^{38-30} \\ & = R\ 3.922 \text{ billion} \end{aligned}$$

This value only differs by -3.6% from the value provided and is therefore reasonable.

Furthermore, the PRMA liability value is carried over correctly from 31 December 2018 to 1 January 2019.

Expected Subsidy Payments during 2019

Comparing this value (R 320 million) to that of the previous year (R 295 million), the increase is not significant and can mostly be explained by the increase in the average contribution rate pmpm from R 3 000 to R 3 270.

This value can be checked for reasonability as follows:

$$\begin{aligned} &-(\#Members) \times (Subsidy) \times 12 \\ &= -(9\,550) \times (85\%) \times (R\,3\,270) \times 12 \\ &= -R\,319\,million \end{aligned}$$

Assuming the number of members remains static throughout the year.

This value only differs by -0.5% from the value provided and is therefore reasonable.

Service Cost during 2019

Comparing this value (R 145 million) to that of the previous year (R 135 million), the difference is not too significant and the increase can be attributed to the increase in the liability at the start of the year.

This value can be checked for reasonability as follows:

$$\begin{aligned} &(PRMA\ liability_{1\ Jan\ 2019}) \times \frac{1}{(Ave\ Past\ Service\ Years)} \times (1 + Discount\ Rate) \\ &= (R\,4\,070) \times \frac{1}{(30)} \times (1 + 7.0\%) \\ &= R\,145\,million \end{aligned}$$

Assuming the PRMA liability as at 1 January 2019 is reasonable (which was demonstrated above).

This value only differs by 0.1% from the value provided and is therefore reasonable.

Interest Cost during 2019

This value can be checked for reasonability as follows:

$$\begin{aligned} & (\text{Discount Rate}) \times \left((\text{PRMA liability}_{1 \text{ Jan } 2019}) - \frac{(\text{Paid Subsidies})}{2} \right) \\ &= (7.0\%) \times \left((R\ 4\ 070) - \frac{(R\ 320)}{2} \right) \\ &= R\ 274 \text{ million} \end{aligned}$$

Assuming the PRMA liability as at 1 January 2019 and the Expected Paid Subsidies during 2019 are reasonable (which were demonstrated above).

This reasonability check also assumes that subsidies are paid uniformly throughout the year.

This value differs by 1.4% from the value provided and is therefore reasonable.

Expected Liability as at 31 December 2019

Comparing this value (R 4.165 billion) to that of the previous year (R 4.070 billion), the difference is not too significant and is driven by the unwinding of the discount rate (interest cost) and the accrual of the projected unit credit method (service cost).

It could be checked that all the components add up:

$$\begin{aligned} & (\text{PRMA liability}_{1 \text{ Jan } 2019}) + (\text{Paid Subsidies}) + (\text{Service Cost}) + (\text{Interest Cost}) \\ &= (R\ 4\ 070) + (-R\ 320) + (R\ 145) + (R\ 270) \\ &= R\ 4.165 \text{ billion} \end{aligned}$$

This value matches the value provided exactly and therefore appears to be reasonable.

[Total 8]

Question 1(x)

Candidates were given an actual Rand amount and asked to explain how this impacts the liability. Most candidates correctly noted a reduction in the liability due to the reduction in the subsidy but were unable to make more detailed deductions or comments than that.

Such a change in subsidy may not be allowed with respect to the current employees and pensioners to whom this contractual promise was made.

However, this depends on whether the subsidy promise was contractual. The subsidy policy will depict the nature and terms of the promise...

This may only apply to new entrants.

However, in order to estimate the maximum impact it can be assumed that all current eligible employees and pensioners' subsidies immediately convert from the percentage structure to the Rand amount structure, the following formula could apply to estimate the impact...

...assuming general inflation is 6% per annum:

Revised PRMA liability as at 1 Jan 2018

$$\begin{aligned}
 &= (\#Members) \times (Rand\ Amount) \times \left(\frac{Ave\ PS}{Ave\ TS}\right) \times 12 \times a_{NRA} \\
 &\quad \times \left(\frac{1 + HCCI}{1 + DR}\right)^{Ave\ TS - Ave\ PS} \times (p_x)^{Ave\ TS - Ave\ PS} \\
 &= (9\ 600) \times (R\ 1\ 000) \times \left(\frac{29}{38}\right) \times 12 \times 15 \times \left(\frac{1 + 6.0\%}{1 + 7.5\%}\right)^{38-29} \times (1 - 0.006)^{38-29} \\
 &= R\ 1.101\ billion
 \end{aligned}$$

Which is 68% lower than the PRMA liability based on the percentage of contribution structure as at 1 January 2018.

Alternatively the revised PRMA liability as at 1 January 2019 could be calculated:

Revised PRMA liability as at 1 Jan 2019

$$\begin{aligned}
 &= (\#Members) \times (Rand\ Amount) \times \left(\frac{Ave\ PS}{Ave\ TS}\right) \times 12 \times a_{NRA} \\
 &\quad \times \left(\frac{1 + HCCI}{1 + DR}\right)^{Ave\ TS - Ave\ PS} \times (p_x)^{Ave\ TS - Ave\ PS} \\
 &= (9\ 550) \times (R\ 1\ 000) \times \left(\frac{30}{38}\right) \times 12 \times 14 \times \left(\frac{1 + 6.0\%}{1 + 7.0\%}\right)^{38-30} \times (1 - 0.005)^{38-30} \\
 &= R\ 1.123\ billion
 \end{aligned}$$

Which is 71% lower than the PRMA liability based on the percentage of contribution structure as at 1 January 2019.

Therefore, based on the above estimation, choosing a fixed Rand amount subsidy (increasing with general inflation per annum) could theoretically reduce the PRMA liability by approximately 70% at most.

Assuming every current member's subsidy converts immediately from 85% of contribution to R 1 000 per month.

However, this 70% reduction may or may not realise due to many reasons:

This reduction in the subsidy would lead employees to perhaps choose a different medical scheme. Especially those on benefit options with contributions much higher than the rand amount subsidy. This could lead to pensioners leaving MIMS at retirement, which would extinguish the liability with respect to these leavers.

In the short-term this liability might remain as is (increasing as active employees near retirement, and reducing as pensioners are subsidised). However this would depend on the long-term assumptions employed by the Valuations Actuary...

...The resignation rates or early retirement rates might increase, resulting in a lower expected PRMA liability (assuming the current benefit remains)...

...While the new entrants' fixed rand amount subsidy won't increase the PRMA liability as much (as the average subsidy amount is lower than before, the exposure should be smaller than before as the employer might struggle to recruit, and the inflation rate is lower than the HCCI).

[Total 4]

QUESTION 2**Question 2(i)**

Part (i) asked candidates to describe a pricing process in depth, starting at the point of receipt of data all the way through to the end of the process with the recommendation of contribution increases to the Trustees for implementation. 30 marks were available for this question making it the most significant question in the paper.

The candidates were expected to discuss all elements of the income statement to be able to make sense of the contributions. Candidates were not required to consider benefit changes, scheme changes or operational changes. No marks were given where candidates referred to these items.

Those who demonstrated limited understanding of the process and factors to consider scored low marks, while those who clearly set out the various steps and considerations for each aspect generally scored better.

Not all candidates clearly set out the process and considerations for a projection to the end of the current year and then a further projection to the end of the following year.

The question included specific detail relating to the fact that the scheme is exempt from PMBs. Candidates were therefore expected to apply the specific features of this type of scheme in considering their approach. Those who scored well tended to have been able to do so.

Scheme environmental aspects

Review information provided to understand the Scheme's history and philosophy - a new actuary should understand the mandate/promise to beneficiaries of the scheme.

The actuary should understand the nature of the Scheme for example if it is a restricted scheme the sponsoring employer(s) and industry in which the employer operates and any trends or issues relating to employment and eligibility for the medical scheme.

For example the underlying subsidies and any recent or imminent changes to subsidy arrangements.

Other dynamics that influence the performance of the Scheme are important to understand for example growth, size, regional or sector focus.

Review the previous valuation reports to understand the decisions made in the past and therefore how they impact on the current year.

Review the budget for the current year to understand how the Scheme is tracking relative to budget and explanations for deviations.

These could include:

- Contribution increases and the underlying rationale
- Risk management strategies including disease risk management arrangements
- Reinsurance arrangement (if applicable)
- Marketing and growth strategy
- Underwriting arrangements
- Capitation arrangements
- Other contractual arrangements

Any other environmental changes that are expected in the current or future year (e.g. an amalgamation with another scheme, or underlying significant mergers or disposals where the scheme would be taking on new members or a large block of new beneficiaries should an employer group start a new division).

This is crucial since the scheme is PMB exempt so one needs to understand how this will affect the ultimate result of the review.

Data checks

Check that the claims and exposure data is in line with the financial statements.

Claims data

Check the minimum and maximum values per risk benefit category to ensure there are no unusually large negative or positive values

Similarly should the options have global fee arrangements or Alternative Reimbursement Arrangements (ARM) for specific procedures (e.g. cataract surgery) there could be missing line level data which would need to be addressed.

Exposure

This should be done for each benefit option for major key risk factors, taking account of the specific externalities of the scheme (industry, geographic concentration, distribution of families and ages, etc.).

Projections

A suitable model should be used to assess the adequacy of the contributions. Since this is a new scheme to the firm, any model (existing or otherwise) would need to be customised for the scheme.

The model should be built to ensure consistency between the projection of the experience in the current year and into the next benefit year.

This is a critical point since its new and the question is trying to test the understanding of the process and not just “black boxing” the process – the mark allocation is an indicator of this

Projection to the end of the year

Claims

Since we are starting the assessment in the middle of the year we understand that the benefit year is not yet complete and so the current experience would need to be projected to the end of the current year.

The claims would also need to be analysed by benefit option and suitable benefit categorisation, for example grouping hospital claims and out of hospital claims in a smaller scheme while a larger scheme is likely to permit more detailed analysis by benefit category.

Should the scheme be growing at a fast rate then one could consider adding a further category such as new and existing business. This is more critical as new business may have a lower claims experience compared to the existing business, which would need to be understood to allow for it correctly in the projections.

One needs to ensure that the appropriate adjustment for Incurred But Not Reported (IBNR) claims have been applied.

A check against the monthly financial statements should be conducted to ensure that the claims used are consistent and complete for this purpose.

Claims would need to be transformed into a suitable unitised form either per beneficiary per month (PBPM) or per member category per month depending on the level of detail required.

Seasonality

To project the current claims to the end of the year one needs to consider the appropriate seasonality pattern to apply. This takes into account the fact that claim development is not linear in a year.

The seasonality pattern should be estimated by examining the unitised claims patterns of several years of experience by relevant benefit category, say 3 years, and by option. This will depend on the size of the scheme and the variation in seasonality by year as well as the incidence of any significant events that may skew or impact the seasonality pattern in any one year.

Furthermore one needs to consider how the current and future year's seasonality would need to be allowed for given a number of external factors...

These could include the number and timing of public holidays (e.g. Easter) as well as traditional holidays (e.g. the December summer holiday).

The actuary may find that the holidays come a month earlier or later which will have an impact on the projections. This may affect the seasonal adjustment being applied to the current year.

The actuary should consider the benefit design particularly given that it is a PMB exempt scheme. This may impact on the pattern of claims in those specific benefit options and should be factored in appropriately.

Membership

The actuary should understand past changes in the number and mix of beneficiaries. In addition the actuary should understand factors that could influence membership growth and attrition in future and take these into account.

The number of beneficiaries in future would need to be estimated. This would be based on the current levels of growth (or attrition) as well as the assessment of the growth strategy and understanding of any major changes foreseen in the environmental assessment.

The projection would need to be consistent with the claims categorisation (i.e. member level, beneficiary level), new and existing business and by option.

Movements between benefit options at the start of each benefit year can impact on the membership mix within the scheme and therefore the performance of each option. An analysis of historical membership movements together with initiatives to retain members on their current options can inform how this is considered in the projections.

Contributions

Specific consideration should be given to any loading for Late Joiner Penalties that are charged. This is usually a percentage of the contributions estimated from current experience.

The modelled contributions should be compared to the financial results to ensure that this is accurate and complete.

Expenses

The expenses would need to be introduced into the model. These will be based on the existing contract arrangements e.g. the amount and how they are charged (e.g. per member or beneficiary level or fixed).

Consideration should be given to any changes to the expenses that may be agreed (e.g. a mid-period increase)....

...a tiered charging structure that changes the fees when the membership numbers reach a pre-specified level.

Consideration should be given to the level of any bad debts that the Scheme is exposed to and whether these remain at the current level or are there any expected changes in the projection period.

If the scheme is open or has specific broker arrangements, broker commissions would need to be modelled specifically since these are set as a percentage of the total contributions charged, with a maximum cap per family unit....

Investment income

The historical investment income analysis would give insight into the investment returns achieved and how these have been allowed for in the budgeting, for example cash returns and dividends received amounts which can be budgeted in the income statement.

These assets should be appropriately categorised to ensure that the correct current and expected returns are modelled for example what is achieved in respect of bonds and cash compared to equities.

Specific care must be given to Accumulated Funds (Section 29 Assets) as this form the basis for the Solvency estimation, for example there may be a different investment treatment of these assets compared to "free assets".

In addition to the investment treatment of these assets one should be aware of how realised and unrealised gains and losses will be treated by the Scheme.

It should be noted that the investment income is modelled at a Scheme and not an option level so will be modelled at the consolidation stage.

Consolidation

The main components of the model are then consolidated to provide the Scheme with the projection of experience usually in the form of a suitability detailed income statement.

Contributions, claims and expenses are multiplied by the corresponding membership patterns so as to obtain the absolute values (per month) of the projected experience per option level, and then summed to get the combined experience for the Scheme.

Hence the ultimate surplus or deficit will be the result of contributions less claims less expenses plus investment income.

At this stage one needs to assess the solvency of the Scheme which would be Accumulated Funds divided by gross annualised contributions.

At this stage the results should be compared to the budget prepared for the current benefit year to ensure that the projection is consistent with expectations. Material deviations should be

investigated for each component to eliminate model or other errors.

Projection to the end of the next benefit year.

In general the contributions, claims and expenses are based on the results from the projection of the experience to the end of the previous benefit year, with specific adjustments needed for the next year.

The basis for this would be the prevailing Consumer Price Inflation (CPI) and the expected level thereof during the benefit year. Appropriate allowance for this should be considered.

In addition the projection assumptions should take into account the directives and guidance according to the Scheme's outlook and philosophy.

Claims

The claims at the unit level will need to be inflated by two main factors. These include the tariff and utilisation components.

Tariff

Tariffs are the cost component of the claims experience. Each tariff category would need to be considered in isolation and taking account of any preferential arrangements with particular service providers and groups, for example doctors, hospitals which would most likely have different tariff increases

Doctor providers are typically treated in two ways. There are those who contracted and those who are non-contracted. Hence depending on the scheme strategy different (groups of) doctors could receive different annual increases.

Hospitals are generally contracted to provide their services at an agreed rate and hence there would be a level of negotiation needed, so their rates may differ

Specific consideration should be given to the cost drivers for the hospitals such as salaries, electricity costs.

In addition there are costs for consumables that affects the hospital cost so one needs to consider the cost drivers on these items (such as the exchange rate, net acquisition costs and quality).

Similarly other service providers (such as pathology and radiology) would be treated separately with any specific underlying cost drivers being taken into account for example exchange rate impact and any special arrangements regarding contracting.

One should also consider specific agreements that are in place with each service provider grouping and apply these as accurately as possible to account for charging structures.

Single exit price (SEP)

The actuary needs to consider the impact of the factors that influence the SEP which include:

- Average CPI for the preceding year
- Expectations of future CPI published by credible sources
- Changes in the exchange rate
- International pricing
- Comments from stakeholders

In addition to the standard formulaic approach one needs to consider the past increases awarded by the Minister of Health when considering the assumptions on this factor since the Minister has deviated from the formula in the past.

Utilisation

Utilisation refers to the frequency of claims. Typically this will change as a result of ageing of the scheme, new technology and other externalities (such as maturity of information of benefits in the environment).

Utilisation by benefit category is important to understand as the patterns and levels of utilisation are likely to be very different from other medical schemes that are obliged to provide for the PMBs.

Consideration of recent trends in behaviour, ageing of the population, any anticipated change in the plan mix would need to be included.

It may be possible to apply more detailed techniques such as Diagnosis Related Groupings and Adjusted Clinical Groups to provide more enhanced understanding of the risks.

Consideration of expected future utilisation is an important assumption to account for so that the modelling of future claim costs adequately includes this underlying cost driver.

Expenses

Expenses are projected in line with inflationary expectations, considering any contractual terms and conditions in place.

Specific adjustments are made after discussion with the relevant contracted parties should there be a potential change in the contracts.

Investments

Investments should follow the same process as discussed in the projection to the end of the year.

However one needs to consider any changes in investment strategy, market conditions and other external influences that could alter the assumptions needed.

Growth

This is based on the previous modelling to the end of the year, but will be adjusted for any specific initiatives of the Scheme.

Consideration should be given to exits in December and entrants in January...

... as well as any plan mix (option changes) that may occur over this period.

Similarly one needs to understand any potential differences in the impact of new business such as the claims experience as it differs from existing business.

Contributions

The setting of the ultimate contribution levels will be an iterative process since these would need to balance the financial (solvency) position of the Scheme and options of the Scheme i.e. that contributions should be set to ensure that the target solvency is achieved...

...taking into consideration the affordability of each option and competitiveness of the options,

Note that while the ultimate solvency level may be regulated, the scheme may still be on the trajectory towards that level and hence one must ascertain if this trajectory is achieved.

Consideration should be given to the balance of the income bands if any exist. There should be some allowance to offset any bracket creep that could result from an inflationary salary increase of the member so as not to unfairly let them move to a higher contribution level.

This is exceptionally important here since the scheme is PMB exempt and the affordability on contributions is a critical factor in retaining the exemption with the Council for Medical Schemes (CMS).

In addition one needs to consider the impact on the scheme on any loss making option as this may require justification in terms of regulations for the need for self-sustaining options.

This position may be acceptable given the overall sustainability of the scheme.

Other considerations

Contracted doctors who form part of a Designated Service Provider (DSP) networks may need to be considered specifically in the assessment. Consideration should be given in combination with the demographic review as to their case mix....

... Since a deterioration in the profile is likely to result in more utilisation and hence a need to model/assess the impact on their remuneration, i.e. a different increase in their capitation fee and so this needs to be accounted for in the increase.

Again this is crucial in the PMB exempt options to ensure a sustainable scheme.

Similarly the use of hospitals in the network would need to be assessed. Here channelling members to specific providers could result in an allowance for volume discounts from the providers resulting in an improved tariff assumption.

Some of the additional techniques that can be considered in the development of the result could include predictive modelling such as Generalised Linear modelling. This can be used to model the impact of plan mix on options and any potential external changes that would affect the scheme (for example a new employer group joining).

In addition the actuary should test the sensitivity of the results to changes various assumptions such as:

- Tariff (cost)
- Utilisation
- Membership growth (contraction)
- Expenses (inflation)
- Investment income

The overall assessment should be checked against the requirements of Professional Guidance issued by the Actuarial Society of South Africa namely APN 303.

[Total 30

Question 2(ii)

Part (ii) required candidates to consider three possible changes to the current medical schemes environment and how schemes operate. Each change impacted on a different aspect of the medical scheme and candidates were expected to demonstrate an understanding of the change, the implications and mitigating actions to be taken.

Answers were generally well structured following the format of the question. Candidates could have scored better by limiting duplication between the various question components. Most candidates attempted all the parts and often wrote meaningful responses getting good marks for this question.

(i) Outlawing of co-payments:

The regulations are likely aimed at improving the customer experience of the Scheme by reducing out of pocket costs.

This has the likely impact that the overall cost to the Scheme will increase and therefore would need to be costed for

The actual impact needs to be considered on the Scheme since this is a PMB exempt scheme and so could experience no impact

In general the Scheme, if this is imposed despite the general exemption to comply with Regulation, could ensure that the beneficiaries of the Scheme are required to access cover via a defined networks of providers

Similarly the Scheme would be immunised by using medicine formularies that would limit the range of medications to those covered

Having a defined network of providers would likely be defensible, especially in the exempt environment to ensure cost effectiveness of access to services

(ii) Underwriting changes

The removal of the general waiting period on children make it more accessible for children to be included in membership

However this may induce a level of anti-selection where children are included only when there is a need for a service, such as a tonsillectomy

Especially since the conditions such as a tonsillectomy is a more acute condition and so a condition specific waiting period could be ineffective

This would result in increased costs to the Scheme that would unlikely be anticipated and difficult to manage

Clarity would need to be gained from the Regulator as to the actual intent and regulation that is proposed

A PMB exempt Scheme is generally exempted so that they provide affordable cover for lower income beneficiaries and so the impact would be more than that of a non-exempt Scheme

(iii) Limitation of the contributions charged

The likely implementation of the Regulation is to make the Scheme more attractive to members in that it significantly reduces the cost of a dependant in the 18-30 age group

Hence this is likely aimed at the “missing-middle” seen in the industry where lives of a certain age are mostly not members of a Scheme

However, these are adult members and while there is a level of affordability there may be limited impact on the Scheme as the PMB nature is aimed at low income families

Hence one needs to weigh up the implications since if there is an increase of uptake there would be an increase in the ultimate cost of delivering benefits

Similarly limiting the child contribution would have a cost impact to the Scheme since the current norm of contributions are approx. 30% of the principal member rate and hence the additional 10% would need to be made up in other contributions

The impact for a Scheme is more likely in the child rate since the limit is low at 20% and the cost of including the child compared to the cost of benefits would be attractive

Overall the actuary would need to understand the actual intention of the regulation and how it would impact the PMB-exempt nature of the Scheme

The nature of the exemption does allow for improving the affordability and so the attractiveness to lower income families, so it's possible that overall there will be limited impact on the scheme since the regulations may not actually apply.

[Total 10]