

Actuarial Society of South Africa

EXAMINER'S REPORT

17 May 2024

**Subject F201 – South African Health and Care
Fellowship Applications**

QUESTION 1**Question 1(i)**

Question 1(i) asked candidates to define what an EDO is and analyse the trends in EDOs from 2017 to 2022 using a provided figure. Candidates were expected to explain the reasons behind these trends and discuss the implications of the growth in EDOs. Better-performing candidates successfully explained the dynamic where members move to cheaper EDOs, which worsens the disease burden and reduces the pricing gap. They addressed the distinction between open and restricted schemes and demonstrated good exam technique by splitting the question into various components.

However, many candidates went into excessive detail on year-by-year changes, which was not the intended focus of the question. Some incorrectly stated that restricted schemes do not offer EDOs and that EDOs attract only young and healthy lives, which are not necessarily true. Additionally, there was a lack of focus on the relevant increase in EDOs from 2018 to 2019 and the flat trend during COVID-19. These inaccuracies and unnecessary details detracted from the overall quality of their responses.

Definition of an EDO

EDOs are sub-options of existing benefit options with additional network or other arrangements for healthcare provision which allows the sub-options to have discounted contributions compared to the existing benefit options.

The objective of an EDO is to pass the efficiencies generated through the delivery of healthcare on to the member, in the form of a discounted contribution.

For example, Option A may provide complete freedom of choice of providers.

The EDO sub-option will offer exactly the same benefits as Option A but will restrict members to using a more efficient mechanism of healthcare delivery, such as an efficient network of providers.

EDOs were introduced in 2008 and allow monthly medical scheme contributions to be discounted for those members who voluntarily limit their access to healthcare to a more efficient delivery mechanism, such as a network of efficient healthcare providers that are utilised to provide healthcare services.

This practice conflicts with the original statutory principle of community rating that contributions may only be differentiated based on income or family size/composition, or both.

Schemes must therefore be exempted from Section 29(1)(n) of the Medical Schemes Act before they can operate EDOs.

As part of such an exemption, the scheme will need to submit a written application, supported by actuarial evaluations and technical analyses as may be required.

In particular, the Council will want to satisfy itself that the discounted contributions reflect the efficiencies of the designated service provider network...

...rather than the demographics and claims propensities of the beneficiaries that are expected to join the discounted benefit option.

As the latter could result in indirect risk rating, which goes against the principle of community rating.

Furthermore, an 8(h)-exemption application also requires exceptional circumstances to be demonstrated...

...although -in the case of EDOs- CMS seems to regard most schemes' circumstances as exceptional.

Trend 1: Increase in Efficiency Discounted Options (EDOs)

The number of Efficiency Discounted Options has steadily increased from 50 in 2017 to 72 in 2022.

Increased demand from members for cost-effective and more affordable options likely drove the introduction of more EDOs.

In an adverse economic environment of high interest rates and inflation, individuals may be more conscious of their healthcare spending. Therefore, schemes are introducing more EDOs to cater to this demand.

The rise in the number of EDOs might be driven by a recognition that certain provider networks are more efficient in delivering healthcare services at the same or higher levels of quality. Schemes may be aligning with high-performing networks to offer quality care at reduced costs.

Schemes may be introducing more EDOs to stay competitive by offering a variety of benefit options, appealing to different segments of the market. Presenting a benefit option with a familiar design in the form of an EDO ensures that members easily comprehend the benefits and services covered. This familiarity fosters a sense of transparency and trust, crucial in healthcare decision-making. While the discounted cost is an added benefit addressing affordability and accessibility with a known sacrifice of freedom of choice to get healthcare services at any provider.

The existence of an EDO in a scheme arguably provides the scheme with more overall negotiating power in its engagements with providers such as hospitals, as the potential of channelling of volumes to any network provider is likely to influence such negotiations.

Trend 2: Increase in Percentage of Lives on Efficiency Discounted Options

The percentage of lives covered on Efficiency Discounted Options has significantly increased from 20% in 2017 to 37% in 2022.

The significant increase in the percentage of lives on EDOs can be attributed to a heightened awareness among members about the value for money associated with these options.

Schemes might have implemented robust education and communication strategies to inform prospective new and existing members about the advantages of choosing EDOs, leading to increased adoption. This may help retain existing members who are considering lapsing and attract new members who see sufficient value in the EDO to join the scheme.

Medical schemes may be strategically positioning EDOs to align with market trends and member preferences.

The observed increase could signify a shift towards a more member-centric approach, where schemes actively respond to member needs and preferences. EDOs might be designed to address specific healthcare concerns and priorities identified through market research and member feedback.

Economic conditions and changes in employment rates likely influenced the uptake of different benefit options.

Consumers may, over time, have become more accustomed to and/or accepting of the concept of an EDO and attendant limitations in freedom of choice.

Schemes may have demonstrated adaptability to economic trends by introducing EDOs as a cost-effective alternative during periods of economic uncertainty. This adaptability ensures that medical scheme membership remain accessible even when individuals experience financial challenges.

The observed increase in the percentage of lives on EDOs could be a response to high medical scheme contribution inflation that outstrips salary increases. Members, seeking ways to manage healthcare costs, may have increasingly opted for EDOs as a cost mitigation strategy, thus contributing to the upward trend.

Schemes recognising the financial burden of contribution inflation might actively promote EDOs as a means of providing financial relief to members. This approach not only addresses member concerns but also positions the scheme as responsive to the economic realities faced by its members.

Collaborative efforts with healthcare providers within the network may have improved the attractiveness of EDOs. Schemes fostering strong partnerships with providers can negotiate favourable terms, enhancing the overall value proposition of these options.

Schemes that actively collect and respond to member feedback may have rapidly refined their EDO offerings based on emerging insights. This iterative process ensures that the options remain relevant and appealing to the changing needs of the member population.

Implication 1: Downgrading trend

The increase in Efficiency Discounted Options (EDOs) has created an environment where members are making more strategic, cost-driven decisions, leading to a trend of selective downgrading.

The availability of EDOs as cost-effective alternatives prompts members to carefully assess their healthcare needs and opt for plans aligning with their financial considerations and still meeting their healthcare needs.

The rise in the percentage of lives on EDOs suggests that members are customizing their coverage preferences within this category, which may lead to further demand for additional customization (GP networks, specialist networks, referral pathways etc.).

Selective downgrading becomes an implication of this trend, as members navigate the spectrum of EDO offerings to match their individual health requirements.

Whereas option downgrades ordinarily would be to the detriment of a medical scheme's financial experience, a downgrade from a non-EDO to an EDO sub-option should not be similarly detrimental provided that the contribution discount is matched by the actual efficiency discount.

...This holds even if these downgrades are anti-selective, for example if predominantly older and unhealthier beneficiaries opt to move to the EDO. While the EDO considered in isolation may appear to be loss-making in such circumstances, the collective experience of the EDO and non-EDO combined should remain unaffected. In fact, to the extent that the efficiencies in the EDO are applied to higher-claiming (rather than lower-claiming) beneficiaries, the combined EDO and non-EDO financial results could improve because the efficiencies could apply to a larger volume of claims.

As members opt for EDOs, they exercise flexibility in downgrading choices, both in terms of benefit option structures and provider selection. Members might voluntarily use non-DSPs as they are not accustomed to such strict network restrictions to access benefits.

The need for increased gap cover is a direct consequence of the downgrading trend within the backdrop of rising EDO prevalence. As members transition to more cost-effective EDOs, there's an amplified demand for gap cover products to bridge the financial gap between medical scheme benefits and out-of-pocket expenses, particularly those due to copayments for voluntary use of non-DSP. This demand

may be further increased by downgrades to EDOs from benefit options with much richer benefits and where the downgrade exposes the member to more copayments than those just from using non-DSPs, for example, differences in specialist reimbursement levels in-hospital.

The observed trend of members downgrading emphasizes the importance of insurers aligning their gap cover products with the changing landscape of EDO preferences. This adaptation ensures that members receive comprehensive coverage even as they make choices that lead to increased reliance on gap cover.

Implication 2: Growth

As more members opt for these cost-effective alternatives, the expected surge in demand is a natural consequence, indicating a high likelihood of growth within the medical scheme industry.

The growth foreseen could signify expansive market opportunities, with the rise in popularity of EDOs playing a pivotal role.

Schemes may strategically explore new markets, recognising the potential to attract both existing members and previously uncovered lives seeking the affordability offered by these options.

The affordability associated with EDOs is likely to act as a catalyst, potentially drawing in individuals who were not part of the medical scheme environment.

The expected growth is closely tied to the schemes' ability to make healthcare coverage more accessible through these cost-effective options.

Implication 3: Market Competitiveness

The increase in the number of EDOs and the growing percentage of lives covered on these plans suggest that there is a demand for cost-effective options in the market.

Medical schemes need to stay competitive by continuously evaluating and adapting their benefit options to meet the evolving needs and preferences of members.

Implication 4: Cost Containment and Efficiency

The rise in EDOs indicates a focus on cost containment and efficiency within the industry.

Medical schemes should continue exploring ways to enhance efficiency in healthcare delivery, negotiate favourable contracts with providers, and leverage technology to optimise administrative processes.

Implication 5: Member Education and Communication

Schemes should invest in clear communication strategies to educate members about the value and benefits of EDOs.

This includes explaining cost savings, network coverage details, and any additional perks associated with these plans.

Implication 6: Diversification of Plan Offerings

There is still a market for conventional unrestricted benefit options.

Medical schemes should maintain a diverse portfolio of benefit options to cater to members with different preferences.

Balancing EDOs with traditional benefit options ensures broader market coverage.

Implication 7: Provider Network Management

The dynamics of the provider network, including its expansion to accommodate more EDOs, are crucial for member satisfaction.

Schemes should carefully manage their provider networks to ensure that EDOs offer adequate access to high-quality care. This involves regular evaluations of provider performance and network adequacy.

Schemes should not make too many changes to their provider networks once members have selected healthcare providers on the network as this may erode trust in EDOs.

Implication 8: Financial Viability

Actuaries should continually assess the financial viability of EDOs, ensuring that these options contribute to the scheme's sustainability and long-term success.

Financial viability of an EDO should always be considered in conjunction with the attendant non-EDO option, and not in isolation. In the event that that, say, unhealthier lives elect to move from the non-EDO to the EDO option, the latter could appear non-feasible considered in isolation while the system as a whole would in fact be better off.

Implication 9: Impact on Healthcare Providers

The emphasis on cost-effective options may influence how healthcare providers structure their services and pricing.

Providers may need to reassess their pricing models and operational efficiency to remain competitive, not only within medical schemes but also in the broader healthcare market.

Healthcare providers who previously refused to contract with medical schemes might start to experience reduced patient volumes as surrounding providers contract with medical schemes and benefit from member channelling.

Implication 10: Consumer Expectations and Awareness

The rise of EDOs reflects an increased awareness of cost considerations among consumers.

Consumers in other sectors may develop similar expectations for transparent pricing and cost-effective options, influencing how services are offered and marketed.

Implication 11: Insurance Industry Evolution

The increase in EDOs signifies an evolution in product offerings and member-centric approaches.

Other insurance sectors may adopt similar strategies, emphasising value-driven products and tailoring offerings to meet specific consumer needs.

Implication 12: Technological Innovation

The need for operational efficiency and cost containment may drive technological and IT innovation within the healthcare sector.

Other industries may leverage similar technologies to enhance efficiency, reduce costs, and improve customer experiences.

Implication 13: Gap Cover Demand

The rise of EDOs may result in an increased need for gap cover to address potential out-of-pocket expenses.

Gap cover becomes particularly relevant when members choose to utilize non-DSPs within the EDO framework, providing financial support for services not covered by the scheme.

In cases where certain treatments or procedures are only partially covered by EDOs, gap cover ensures that members can access the required healthcare without significant financial strain.

For members with complex healthcare needs that extend beyond the scope of EDOs, gap cover offers a safety net, covering expenses that may exceed the limits of the discounted options.

The rise of EDOs necessitates an adaptation within the insurance industry, prompting the development of specialised gap cover products tailored to the unique characteristics of these cost-effective options.

Implication 14: Cross-Industry Collaborations

The dynamic nature of EDO-related trends may encourage collaborations between insurers, healthcare providers, and technology companies.

Cross-industry collaborations may emerge in other sectors to optimise services, improve efficiency, and enhance customer experiences.

Examples include:

- Hospital at home - a service that allows members to receive treatment for acute illnesses at home, which would typically require a hospital stay. This programme uses wearable digital devices to track patients' health and provides daily home care nurse visits, physician consults, and treatment from physiotherapists.
- Dynamic provider selection - a feature that dynamically guides members to the most appropriate healthcare provider in their network, given their healthcare needs at the specific point in time.

Implication 15: Enhanced provider profiling

The need to select the most efficient providers to belong to the EDO network will drive improvements in provider efficiency analysis, particularly around the risk-adjustment techniques to adjust for differences in their patients' disease burden.

Providers should not be excluded or removed from the network due to sicker patients selecting them as their provider.

[Question 1(i): Total 25]

Question 1(ii)

Question 1(ii) required candidates to compare and contrast EDOs with conventional network-bound benefit options. Better responses focused on the specific differences between these two types of options, providing clear and concise comparisons. However, many candidates repeated content from part (i) without adding new insights, which indicated a lack of differentiation in their understanding. Generalisations without proper explanations were common, and many candidates did not fully grasp the differences between EDOs and traditional network-bound benefit options. Some made unsupported conclusions, trying to connect unrelated dots, which further undermined their answers.

Similarities between an EDO and a conventional network-bound benefit option

Both EDOs and traditional network-bound benefit options limit access to a predefined network of healthcare providers. This commonality ensures that members are aware of and adhere to the specified network when seeking medical services.

Both EDOs and traditional network-bound benefit options can be based on a network of any provider type: whether hospital network, GP network, specialist network, pharmacy network, etc.

Members would need to choose upfront whether they would like to participate in this benefit option – being fully aware of the restrictions to a network of providers.

Members could change their minds about their participation in such benefit options – typically once a year, which is in line with normal option selection.

When claiming for a non-designated service provider, a high/penal co-payment could apply.

Which could take the form of a rand-amount (e.g. deductible) or a percentage

The procedures for submitting and processing claims are generally similar for both EDOs and traditional network-bound benefit options. Members in either option may encounter specific protocols and documentation requirements when claiming for covered services.

Differences between an EDO and a conventional network-bound benefit option

An EDO has a parent benefit option offering exactly the same benefits where the only difference relates to a provider network: the EDO will be restricted to a provider network, while the parent option has no such network restriction. A conventional network-bound benefit option has no parent option.

An EDO usually has a contribution amount that is approximately at least 10% lower than that of its parent option, while a conventional network-bound benefit option does not have a comparable benefit option with which to ascertain whether a discount applies or not.

An efficiency discount requires exemption from the Act, whereas a network-bound benefit option does not.

A network-bound benefit option will be required to be self-sustaining in terms of section 33(2)(b) of the Act, whereas an efficiency discount can allow for cross-subsidisation between the parent option and the EDO.

EDOs, due to the nature of efficiency discounts and the exemption requirements, involve a more complex regulatory landscape compared to traditional network-bound benefit options. The need for regulatory exemptions adds an additional layer of consideration for EDOs in terms of compliance...

... as such exemption need to be re-applied for on regular intervals (every 3 or 5 years).

Conventional network-bound benefit options primarily rely on risk pooling within the specific network. In contrast, EDOs may employ different risk-pooling strategies, leveraging the connection with a parent option and allowing for cross-subsidization between the restricted and unrestricted groups.

[Question 1(ii): Total 7]

Question 1(iii)

Question 1(iii) asked candidates to discuss factors to consider when evaluating an efficient provider network, specifically focusing on cost, access, and quality. Overall, candidates performed well in this part, addressing each component with clear explanations and good examples. They effectively demonstrated their understanding of the necessary considerations for evaluating provider networks. However, a few candidates missed the critical point about needing to risk-adjust costs for meaningful comparisons between providers. This oversight, although not widespread, indicated a gap in some candidates' understanding of the importance of adjusting for risk in cost evaluations.

The efficiency of a healthcare provider of any kind is typically based on three factors:

- cost
- quality
- access (e.g. geographical proximity to members)

Cost

Collect comprehensive and accurate data on healthcare costs associated with the provider. This includes direct costs of medical procedures, treatments, and indirect costs related to provider choices and referrals for additional healthcare services.

Implement risk adjustment techniques to account for variations in patient demographics, health conditions, and other factors that may influence costs.

And adjust for the complexity of cases treated by the healthcare provider, ensuring a fair comparison among providers.

Calculate the cost per unit of service, such as per patient, per procedure, or per treatment episode. This involves dividing the total costs by the relevant unit to standardize comparisons.

Benchmark the provider's costs against industry standards, regional averages, or peer groups. These will help to identify whether a provider's costs are in line with expectations.

Conduct trend analysis to examine cost patterns over time. Assess whether the provider's efficiency has improved or deteriorated over different time periods.

Quality

Assessing the quality of healthcare providers is a critical aspect of actuarial analysis to establish the efficiency of a healthcare provider. Actuaries can use various metrics and methodologies to evaluate the quality of care offered by providers:

Clinical Outcomes

Actuaries leverage clinical data, including health outcomes and patient recovery rates, to assess the effectiveness of medical treatments provided by different healthcare providers.

Comparing clinical outcomes against industry benchmarks or standards helps actuaries identify providers that consistently deliver high-quality care.

Patient Satisfaction

Actuaries may design surveys or analyse patient feedback to gauge satisfaction with the healthcare experience. High patient satisfaction often correlates with efficient and patient-centred care.

Monitoring complaints and grievances filed against providers can provide insights into potential quality issues and areas for improvement.

Accreditation and Certification

Actuaries consider whether providers meet industry-recognized accreditation and certification standards. This includes certifications from medical boards, recognition by healthcare quality organizations, and compliance with clinical guidelines.

Readmission Rates

Actuaries examine hospital readmission rates to understand if patients are being effectively treated the first time, reducing the need for recurrent hospital visits.

In parallel to understanding readmission rates, actuaries can further investigate complication rates, hospital acquired infections and mortality rates.

Efficiency and Cost-Effectiveness

Actuaries evaluate how efficiently healthcare providers use resources, including staff, equipment, and facilities. Efficient resource utilization often correlates with cost-effective care.

Actuaries may analyze the total cost of care for specific medical episodes, considering both direct and indirect costs. This provides insights into the efficiency of care delivery.

Risk-Adjusted Performance

Actuaries apply risk adjustment techniques to account for variations in patient populations. This ensures that providers are not unfairly penalized for treating patients with higher levels of medical complexity.

Collaboration and Care Coordination

Actuaries assess the degree of collaboration and communication among healthcare providers within the network. Effective care coordination often leads to improved outcomes and efficiency.

Telehealth and Technology Adoption

Actuaries may evaluate the integration of telehealth services and other technologies, as these can enhance access, convenience, and potentially improve overall efficiency.

Access

Actuaries assess the adequacy of the provider network by evaluating whether the network can meet the healthcare needs of the population intended to be covered.

This involves considering geographical coverage, the range of medical services offered, and provider capacity.

Geographical Coverage

Actuaries should analyse demographic and geographic data of the covered population. This includes understanding where members reside and assessing the distribution of healthcare facilities within those regions.

Actuaries calculate access metrics, such as the average distance members need to travel to access network providers. They also consider factors like transportation infrastructure and potential barriers to access.

The CMS guidance is 50km as a threshold for “involuntary use”, and a scheme may want to consider utilising a shorter distance of 20km or 30km.

Actuaries compare the geographical distribution of the provider network with regulatory or industry standards for network adequacy. This ensures that members have reasonable access to healthcare services within a reasonable distance.

Provider Capacity

Actuaries assess the capacity of healthcare providers to handle the expected volume of patients from the medical scheme. This involves understanding appointment availability, hospital bed occupancy rates, and the ability of providers to scale their services.

Actuaries may conduct surveys or engage in discussions with healthcare providers to gather insights into their current capacity and any plans for expansion. This helps in anticipating potential challenges and addressing them proactively.

Provider speciality

Actuaries should consider whether there are sufficient providers by specialty for the population (obstetricians, endocrinologists and geriatricians). This may include super-specialists for very complex special cases (paediatric cardiologists, neonatal oncologist).

Involuntary use

Actuaries should consider the fact that, in the event the service being sought is not reasonably or immediately available from a geographically proximate network provider, the Act and Regulations will require the scheme to waive any copayments.

[Question 1(iii): Total 8]

Question 1(iv)

This question required candidates to explain the approaches to establishing a healthcare service provider network for an EDO benefit option, including the factors to consider in managing the network and the interrelationships between providers. Some candidates provided thoughtful and relevant responses on establishing provider networks. However, many focused unnecessarily on alternative reimbursement models, which were not a requirement for this question.

There are two fundamentally different approaches:

An any “willing provider approach”

The scheme could enter into contracts with providers in which they agree to subject themselves to some conditions such as consenting to profiling, and not to balance bill members.

The scheme could then use the results of such profiling to engage with providers and encourage them to become more efficient over time.

For example, the scheme could offer an enhanced fees to providers that perform well in the profiling, or conversely, lower fees for providers that do not perform well. (Any provider discipline can be used as an example.)

A “cherry picking” approach

An alternative approach would be for the scheme to identify cost efficient providers and approach and/or nominate the most efficient providers to become part of its DSP network.

Circular 39 of 2017 and/or Government Gazette 435 of 2017 suggested, for the first time, that schemes cannot just “nominate” but must follow a tender process.

Whilst it is possible to require a co-payment on voluntary usage of non-DSPs in the case of PMB claims the involuntary utilisation of non-DSPs cannot be subject to co-payments.

From a product design perspective, it is therefore important to structure the product clearly so that involuntary usage is clearly defined, compliant with the act, and provided for appropriately.

This could involve

- The consideration of what constitutes an “emergency”
- The consideration of geographical proximity and timeous access. (CMS has indicated that a distance of more than 50km between the beneficiary and the DSP could be used as a guideline to motivate involuntary utilisation) These complexities should be addressed proactively.

For example, a beneficiary may be required to nominate a specified pharmacy upon registration and certify that the pharmacy is sufficiently close to his/her home and/or work. (Any provider discipline can be used as an example.)

Alternatively, this could be catered for through benefit design, allowing two or three “out of network” claims per year to ensure that beneficiaries can access chronic medication whilst on holiday.

Although this would dilute the efficiencies which the scheme hopes to generate through the efficiency discount.

A tender or “request for proposal” approach

When a medical scheme goes out on tender to invite all willing healthcare providers to be part of an efficient provider network, it follows a process that is cognisant of providers' efficiencies.

This process involves asking all providers to provide their best price for services.

After the bids are submitted, the adjudication of bids takes place, considering the providers' efficiencies.

This selection process is influenced by various factors, including the efficiency of the providers, their ability to meet the needs of the medical scheme's members, and the overall quality of care they can offer.

Factors to consider***Understand the goals of the provider network***

What are the primary objectives of setting up this provider network? Is it to enhance member access, control costs, or improve the quality of care?

Engage potential healthcare providers

Understand their capabilities, willingness to participate, and expectations regarding reimbursement.

Define Provider Network Criteria

Clearly define the criteria for selecting providers, including quality standards, cost-effectiveness, BBEEE level and geographical coverage.

Consider negotiating contracts with providers that align with the scheme's goals.

Technology Infrastructure

Implement robust technology solutions for efficient management of the provider network. This includes tools for credentialing, claims processing, and network monitoring.

Ensure interoperability with existing healthcare systems.

Member Communication

Transparently communicate the changes to members. Clearly outline the benefits of the new network in terms of improved access, quality, and potential cost savings.

Continuous Monitoring and Evaluation

Implement systems for ongoing monitoring and evaluation of the provider network's performance.

Regularly review key performance indicators and seek feedback from members and providers.

Interrelationships between providers

Develop referral mechanisms for cases that require specialised care, promoting a seamless transition of patients between primary care providers and specialists within the network. Ensure providers are aware of other specialty providers that are included in the network to avoid co-payments when members use non-DSP providers following referral.

Ensure there is alignment of the hospital network and the specialist network to include specialists working at the hospital. For example: If a cardiologist is part of the specialist network, the hospital where the cardiologist frequently operates should also be included in the hospital network. This ensures that members have access to both the specialist and the necessary facilities for procedures and treatments.

Ensure there is a GP-Pharmacy Connection. For example: A GP who is part of the GP network and also acts as a dispensing GP should have the medications they prescribe reimbursed as if the GP is part of the Pharmacy network. This integrated approach streamlines medication reimbursement processes for members.

Emergency Care Coordination. For example: Emergency room physicians within the hospital network should collaborate with ambulance services and paramedics. This ensures seamless transitions from emergency situations to hospital care, promoting efficient and effective emergency response.

Technology Integration for Information Sharing. For example: Implementing a shared electronic health record (EHR) system allows providers across different networks to access relevant patient information. This promotes continuity of care, reduces duplication of tests, and enhances collaboration among providers.

Regularly review and update contracts, policies, and procedures to ensure relevance and effectiveness over time.

[Question 1(iv): Total 10]

QUESTION 2**Question 2(i)(a)**

Part a asked the candidate to discuss the data requirements needed to build the model. This part was answered well by a number of candidates, but many provided generic data requirements and did not adequately delineate the drivers of the claims (e.g. demographic and chronic condition burden) vs. the actual claims that were presented. Those that did well linked the drivers of the claims to the data required and generally explained the reason for the data needed. Candidates are reminded to pay attention to the question word when drafting their responses.

Data required

Demographic factors such as age, gender, benefit option are required to determine basic demographic cohorts of lives and risk factors for claims experience

Type of member, for example individual or part of an employer group as group lives often have a compulsory requirement for medical scheme cover through the employer and hence lower levels of antiselection

Other demographic factors available such as region, employment status, family size, which may give more insight into the nature of health seeking behaviour and access to healthcare services.

Pre-existing conditions as declared for underwriting purposes to test the extent to which new lives can be expected to be high cost claimers based on their existing conditions.

The application of any underwriting on entry including 3 month general waiting period and 12 month condition specific waiting period and late joiner penalties. This information can assist to identify claimants whose full claims experience has yet to emerge once the waiting periods have been completed.

Registrations for Chronic conditions as per the Chronic Disease List including the actual chronic conditions that they are registered for and any comorbidities

Registrations for other conditions that the scheme may cover that are not part of the Chronic Disease List, for example these may be on the additional diseases list.

Additional chronic disease information such as disease stage, duration since diagnosed with each chronic condition, whether the member is actively claiming for medication or other benefits for the condition

Registrations for other conditions such as cancer, renal failure where the condition may be ongoing and claim costs are likely to be high

Enrolments on disease management programmes for any of the above conditions

Mental health conditions in addition to CDLs such as major depression as this may have the potential effect of impacting the disease burden and hence the costs of care.

Clinical data on their conditions, for example medicine adherence, as those who are more adherent to chronic medication requirements may have better healthcare outcomes compared to those who are not.

Prior claims experience including hospitalisation for each condition and the characteristics of each hospital admission, including length of stay, levels of care, cost of admission, rehabilitation post hospitalisation, etc

Out of hospital claims experience including doctor consultations, allied health professional consultations and others reflecting engagement in managing healthcare on a regular basis. The identification of high cost claimers may also be through high out of hospital expenditure, not only in hospital expenditure.

Claims data should be at a code level including procedure codes, tariff codes and disease codes (ICD-10 codes) so that the modelling can be done at a disease and intervention level.

Consider any groupings of codes indicating disease severity or hospital admission categories such as Diagnosis Related Groups (DRGs) etc. The use of clinical classifications can assist to determine the primary disease or intervention for that member.

Decide on the time period for the data, for example obtaining at least 2-3 years worth of claims experience, but probably better to have 5 years to capture prior hospital events in the period specified.

Consider the size of data set required given that the scheme only has 100,000 lives. With 10% being high cost claimers in 2023, equating to only 10,000 lives, it may be necessary to use a longer time period.

The claims costs would need to be inflation adjusted where data from prior years is included.

Consider members who have joined and left and which to include in each time period so that the exposure is appropriate for the analysis.

Consider the effect of employer groups joining and leaving on the data sets for the same reason as above and to cater for the data truncation that occurs on exit as we would not have their full claims experience either prior to joining or after lapsing cover.

Given the recent growth of medical scheme X, assess if high cost claimers are relatively new to the scheme or are long tenure members of the scheme.

Collect and augment the data set with socio economic data if available, for example earnings, industry, location, to assess regional disease variation or access to health services.

Incorporate lifestyle data such as weight, height, waist circumference, exercise frequency and intensity to establish the effect of quality of health for each claimant to the extent that this data is available etc. These might be predictive or explanatory variables for high cost claimers.

Consider if any clinical information is available such as laboratory test results, screening test results, vital signs including blood pressure readings, HbA1C, kidney function scores, etc

Consider data on existing medications being taking on a chronic and/or acute basis and the adherence to the medication requirements.

Understand the current distribution of claimers by total cost to assess the appropriateness of the R500,000 suggested by the trustee. Consider various distributions to determine the trade-offs between the volumes of lives, high costing amounts and model fit.

Question 2(i)(b)

This required the candidate to discuss the potential modelling methodologies and considerations that need to be given to the methods considered. The candidates that did well were able to go into detail on the potential models but also were able to articulate the reasons why one model could be used over another: including the potential strengths and weaknesses. The weaker candidates provided the basics of a model without going into sufficient detail of the models and did not cover the considerations of the models in sufficient depth.

Modelling methodologies

The modelling approach can be done in several ways. We discuss modelling the high cost claimers using a Bayesian approach, i.e. modelling the probability of each individual being a high cost claimer and then modelling claim costs given the claimer was a high cost claimer. Other relevant approaches will be considered.

Develop a model to identify the probability of incurring claims above the high cost claimer threshold

- Demographic factors including age, chronic disease profile and other demand side features available
- Use prior claims experience over the period available

Develop a model to quantify claims costs to be incurred above the threshold split by

- In hospital costs
- Out of hospital costs
- Total claims costs

Consider actual costs of claims incurred to assess claiming patterns including claims severity and claims frequency and how these might be changing over time for a given demographic.

Consider claims patterns of those who become high cost claimers to identify predictive variables for the population.

Test the various demographic risk factors to ultimately select a set of factors that account for the impact of ageing and level of disease burden

Identify relevant clinical risk factors such as chronic conditions, medication adherence and health system participation (for example regular GP consults, specialist consults, results of pathology tests etc)

Use risk adjustment when comparing the results of different population cohorts to allow for differences in the mix of lives over time for example more older lives who might be more likely to be higher costing claimers

Types of models that could be used, for example GLMs for frequency and severity modelling with different underlying distributions used for each model.

GLMs offer the advantage of transparency of feature (risk factor) selection and the effect thereof on results while it is limited by having to carefully select these features.

Machine learning models can give individual level predictions and can potentially cater for more variables or risk factors. These types of models may be more useful than GLMs if there is a rich dataset with numerous risk factors that may be applicable.

Machine learning models offer the advantage of greater accuracy and use of more features but may not always be transparent and offer individual level predictive factors. Therefore it may be difficult to assess the fit and which aspects of the model fit are effective.

Machine learning models will require a data set to train the model on and another data set to test the model on therefore requiring a large enough data set over a sufficiently long period.

Model fit needs to be weighed up against accuracy of predictions and appropriateness of underlying factors used in the model.

As the data set is for identifying high cost claimers, the distribution is skewed and so the models need to account for the skewness and the fact that outliers may have a significant influence on the results.

Consider if there is a need to trim out or adjust for extreme outliers or unusual claims, for example deaths or major trauma events that are difficult to predict.

Effect of data volumes on modelling quality is an important part of model selection and assessing the fit of the model.

A variety of measures of goodness of fit should be used to test when and how well the model fits the data.

It is often useful to use different models and compare the results and which aspects of each model are useful predictors for high cost claimers. Similarly it may be useful to consider a variety of high costing thresholds to take account of the variation in claim costs.

Consider generating confidence intervals to identify the variation of the results and the significance of the prediction.

Consider if the high cost claimers are driven by in hospital or out of hospital claims or both.

Suitable credit for other model fitting or machine learning considerations on model selection, fitting, variable importance and model comparison

Consider limitations within the data for example entrants and exits with less than 12 months of data, those with missing data and those with no history of being high costing claimants

Descriptive versus predictive modelling – a linear regression may provide descriptive modelling on which variables may explain an individual being high costing but not necessarily predictive

Modelling considerations

Model based on claims data only so not reflecting out of pocket payments that may have been made but not captured in the claims paid data.

May not have the full amount of the claim given copayments and deductibles so an approach could be to use the amount claimed rather than amount paid so the full cost of the claim for the member is captured. However, these claim cost sharing mechanisms are likely to be plan specific.

Effect of benefit option on frequency and amount paid for claims has the tendency to overstate amounts for those on more comprehensive plans while understating for those on lower benefit options

Selection of model for probability of being a high cost claimer – the model would need to include sufficient high cost claimers to identify the features that might explain the high cost claimer likelihood such as age and chronic disease burden.

Selection of model for amount claimed given a high cost claimer – the model would need to include sufficient cost data to quantify the cost of the claimer.

Trauma events that are less predictable and can be very high costing may need to be excluded or modelled separately as these may be less likely to be linked to underlying demographic factors.

Consider using the model to identify repeat high cost claimers who have interval high cost claims compared to those who are once off high cost claimers

Identify new high cost claimers to assess the features of that population, for example does it coincide with registration for a chronic condition or multiple chronic conditions, or is it more linked to age or other life events.

Consider if oncology lives need to be modelled separately and the benefit plan that they are on giving an indication of the likely cost of treatment.

Consider if other types of events need to be modelled separately for example trauma, neonatal which can each be very high costing events with possibly less predictive capability.

Consider the impact of buy ups to access higher levels of benefits on the claims costs

Which models tend to result in the best predictive performance vs which predictors best explain high utilisation

Question 2(i)(c)

The candidate was asked to discuss the implementation and later testing of the functionality and accuracy of the model. This question was not answered well and only a few candidates managed to do well. These candidates adequately discussed the implementation of the model and how it could be integrated into current systems as well as how the results of the model can be used to affect the interventions that could prevent or reduce the impact. The weaker candidates concentrated on the back testing of the model, and although relevant, this did not fully answer all parts of the question. Even here the weaker candidates relied on "lists" of checks that could be done without linking to the specific scenario being presented.

Implementation

Consider the frequency of data refreshes, for example monthly

Consider the frequency of modelling updates including the data refresh frequency so that the model can be developed to be updated regularly, such as every 6 months or year depending on the use case and frequency of monitoring experience.

The number of cases to be evaluated is a function of the number of high cost claimers, the definition of a high cost claimer and the data available for each of these.

The number of cases to be evaluated may also need to be assessed with reference to operational capacity to review these cases and decide which are most critical to intervene on. This would rely on clinical and operational expertise and capacity.

Developing use cases of predicted high cost claimers to test if the model is correctly identifying members that may become high cost claimers. This would need to be validated clinically.

Perform a retrospective review of cases identified by the model to identify the types of cases that are predicted, which variables are significant and these might explain both the likelihood of being a high cost claimer and the costs.

Allowing for feedback on the accuracy of the model by identifying features or outputs that need to be updated.

Implementation process would need to engage with the relevant teams in the business who will be utilising the predictive model outputs on the types of information they would be receiving, the clinical processes for intervention and the ways in which these actions can be recorded and measured.

Consider the ease of updating the model and the sensitivity to time changes, for example is the model update needed every year, every 6 months, every month.

Consider if the cut off of R500k is appropriate – is it returning too many or too few high cost claimers.

Model testing

This phase is an application of the actuarial control cycle.

Compare actual high cost claimers with predicted high cost claimers to test the amount of overlap

At an overall level and by various splits including benefit option, chronic conditions and prior hospitalisations

Identify areas of difference and potential reasons for the differences

Analyse predicted high cost claimers to assess the clinical appropriateness of these predictions

Analyse the predicted costs against actual costs

Analyse identified potential high cost claimers to understand current claims experience and potential reasons for becoming a high cost claimer

Identify areas for intervention for example disease management programme enrolment

Over time measure the impact of the intervention by capturing the type of intervention and the level of savings achieved for each intervention

Keeping track of which members are actually high costing and if they were predicted, similarly those expected to be high costing but were not

[Question 2(i): Total 35]

Question 2(ii)**Design and costing of the fit for surgery benefit:**

The question asked the candidate to describe the considerations and costing of a “fit-for-surgery” benefit to be implemented. There were a few candidates that were able to score well in this question while the rest were unable to go into enough depth. The candidates that did well were able to show the need to balance the need for the required information vs. a plethora of information that would not guide the process of determining the level of fitness. Some of the weaker candidates discussed the marketability and competitiveness of the benefit rather than addressing the purpose of the benefit. They did not go into any depth of the data needed nor costing of this benefit.

Consider the types of pre-surgery evaluations needed and how this might differ by type of procedure and by age for each procedure

Effect of the underlying chronic disease burden of those undergoing the evaluation on impacting those who might need it most

Consider if the benefit is compulsory for those with certain conditions or comorbidities, those over a specific age or other factors

Consider for whom the benefit is voluntary and the terms on which they can take it up

Analyse the data to identify which members are currently receiving pre-surgery evaluations and support and the effectiveness of these interventions

Similarly, analyse those without the intervention and their outcomes and costs

Identify the types of doctors conducting the evaluations and their associated costs, effectiveness and programme, for example number of consultations, duration between consultations and surgeries and how this differs per surgery and population demographic

Consider those for whom surgery does not go ahead following consultations and the implications of this

Quantify the costs of the various interventions at a surgery and demographic level

Based on the expected level of uptake quantify the expected cost of offering this benefit

Quantify the expected improvement in experience for those having surgery following this intervention on lower costs of surgery itself (for example shorter length of stay in hospital, lower likelihood of needing ICU and/or high care) and other measures such as lower likelihood of readmission.

Costs of more engagement out of hospital pre-surgery such as dietician, biokineticist, GP, physio, etc to support health improvement

Combine the respecting costs and savings to determine the overall cost of the benefit

Impact on the high cost predictive model

Candidates were asked to discuss how they would evaluate the impact of the benefit. This was not answered well. Those that did well were able to include the corrections one would need to add to ensure that correct conclusions would be made. For example, there would be a high requirement for risk adjustment of presenting patients as well as indicating the avoidance of the high-cost cases as well as the cost reduction that could occur. The weaker candidates relied on the basic checks and did not go into sufficient detail.

The predictive model lives used as input data can be stratified by the outputs of the model based on those identified to be high costing in the next 12 months

This can include clinical classifications such as disease diagnosis, and the presence of one or more severe chronic conditions such as renal failure

The group can be split by those incurring medical conditions and those undergoing surgical procedures. While the groups are unlikely to be mutually exclusive, the group of interest is surgical procedures and more specifically those undergoing surgical procedures at an older age and/or those who have demographic or disease characteristics with high predictive values for being a high cost claimant.

The analysis can be those who underwent surgery without the pre-surgery readiness intervention compared to those who did have it

Risk adjustment will be needed to compare the populations accounting for differences in demographics

The relative improvement in surgical cost and post-surgery costs can be evaluated on a risk adjusted basis to quantify the impact of the benefit change

The high cost predictive model can use this benefit in future as a variable to capture the effect of those ready for surgery.

The extent to which this is a variable of importance for surgical patients would need to be evaluated in the model

The model updates and outputs could then be specifically generated to provide predictions for those undergoing major surgery and direct the intervention towards them and their healthcare specialists, for example surgeons, orthopaedic surgeons, neurologists, cardiologists, etc.

[Question 2(ii): Total 15]