

EXAMINERS' REPORT

November 2016 examinations

Subject F101 — *Health & Care* Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's Principal Examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners, and should not be taken as model solutions

QUESTION 1

Candidates did well in the first part which was bookwork. However, they did not do well in the rest of the question. The most common errors were that the candidates discussed administration costs despite being asked to discuss medical costs, and they interpreted second opinion to mean that the second doctor had the right to approve or reject the claim whereas the purpose of the second opinion was only to provide advice on medical treatment from a second doctor. Many candidates did not write enough for the last part of the question.

i.

Managed care is the term given to a process whereby an insurer intervenes \checkmark in the provision of medical care with the dual objective of optimising the quality \checkmark of treatment for the policyholder and controlling the cost to maintain the affordability \checkmark of healthcare (by such means as preferred provider utilisation and claims pre-authorisation \checkmark).

ii.

In a fee-for-service arrangement, the doctor has financial incentives to recommend treatment more aggressively than the patient may need \checkmark . Because of asymmetric information, the patient cannot always tell when the advice is not appropriate \checkmark . By offering to pay for a second opinion, the insurance plan signals to the patient the possibility of receiving “tilted” advice from the doctor, and also creates a way for the patient to get advice from a doctor who has no possible financial stake in the outcome \checkmark .

The success of the approach depends on its ability to alter patients’ choices \checkmark for the treatment they receive. It can result in reduced costs by avoiding unnecessary surgeries \checkmark .

However, there are reasons the second opinion program will not work \checkmark to change the outcome:

- Patients are often reluctant to use the second opinion of the other doctor when it seems as if they are challenging their doctor’s advice. \checkmark
- The second opinion almost invariably comes from another doctor in the same region because the patient would not be expected to have to travel far for the second opinion \checkmark . This means that the practicing styles of doctors are likely to have some within-region similarity \checkmark . Thus an initial recommendation for surgery will likely find a concurring second opinion.

- Doctors may not give completely honest opinions \checkmark even if they have no direct financial benefit (e.g., doing a surgery) from the patient. The problem arises from the possibility of an “implicit collusion” due to a tacit agreement (never specifically stated) to cooperate. \checkmark

A patient from Doctor A goes to see Doctor B for a second opinion. But Doctor B knows that their roles might be reversed at some time in the future, with Doctor A rendering a second opinion about the value of Doctor B’s recommendation. This will invariably alter the advice rendered by Doctor B, making the recommendation more likely to concur with the original recommendation. \checkmark

- Explicit collusion is a possibility too. \checkmark

- A second opinion may not be possible in emergency situations. Advice given in these instances will not receive a second opinion and are open to pushing more services than needed ✓. Doctors may code a surgery as being an emergency when it is not to manipulate the system ✓.
- The second opinion may recommend an alternative treatment which is more expensive than the first recommendation. If that is taken it will increase the costs of surgery.

Further, there is an increased cost of the second opinion consultations ✓. This is a pure increase (not offset by a saving) where the second opinion agrees with the original advice for surgery.

[Max 6]

iii.

Patients:

- Will not like having to see another doctor or receive a second opinion. ✓
- May feel confused if the opinions are not in agreement. Information asymmetry means they won't know who has given the best advice. ✓
- May only become aware of this requirement when making a claim and so may feel aggrieved at having claims declined or having to wait until the second opinion has been made before going ahead with surgery (waiting times may be inconveniently long). ✓

Doctors:

- Those who feel their professional opinion is being questioned will respond negatively. ✓
- May resent the insurer or other doctor influencing the way in which they practise medicine. ✓
- Increased burden of consultations for fixed amount of resources (doctors). Might feel that they are too busy to have to see patients who are already receiving appropriate advice (adding to the problem of long waiting times). ✓

Regulator:

- May find there is a need for the insurer to educate the doctors instead. By upskilling doctors or creating a peer review process, the burden is passed to the insurer instead of making the patient seek a second opinion. ✓
- May require the insurer to help the patient make an informed decision in the case of receiving conflicting advice. ✓

[Max 3]

QUESTION 2

This was an applied bookwork/higher level question.

Candidates that did well in this question were able to present distinct concepts, and explore them in sufficient depth (while remaining succinct).

The theory section of part (i) was answered generally well. Stronger answers explored how

benefits could be converted into monetary terms.

Solutions for part (ii) that presented a wide range of ideas here did better than solutions that went into detail on a single point

i.

“Cost-benefit analysis” (CBA) puts a monetary value on the cost ✓□ of the healthcare system and a monetary value on its outcomes ✓□ and therefore allows for a direct comparison of cost and outcome. ✓

CBA = Cost in monetary units / Benefits in monetary units.

For a project to be recommended CBA <1. ✓✓

Costs can be compared to changes in the maternal mortality and morbidity of various segments of the population, as well as the impact on economic productivity. ✓✓

One of the advantages of this method is that the increased allocation to maternal health can be evaluated on its own merit, □ rather than making comparisons between different systems. ✓✓

The first step is to assign a monetary value to the prolonged life and/or change in health status. ✓✓

The conversion of health status into a monetary value per unit is challenging and it is controversial to assign a monetary value to changes in a person’s health. ✓✓

The benefits should consider changes in life expectancy as well as quality of life. ✓

Quality of life can be measured using a health status index (one dimensional) based on finite aspects of health. This index would then need to be converted to monetary values for CBA. ✓✓

[Max 6]

ii.

Pros

- Reduced maternal mortality in poor/ rural communities.
- Reduced number of orphans and hence burden on state.
- Reduces the economic impact of losing a productive working age citizens.
- Access to treatment for hemorrhage to women who couldn’t usually access this at time of delivery.
- Reduces expected downstream emergency care costs related to hemorrhaging
- Increased awareness of risk and active prevention of potential maternal mortality.
- Relatively low admin-intensive way of improving healthcare (using existing infrastructure).
- Communities may perceive this as a very important benefit offered by the government, and that the government cares for its people, potentially attracting more votes at the next election

Cons

- Might not reach as many woman as desired, or as quickly as desired
- Delivery of pills to rural areas, which need it most, may be logistically difficult
- The pills may be very expensive, i.e. no generic available at this stage

- If education of the public about the risk of hemorrhage and treatment for reduction is not improved, this strategy might not make the size difference hoped for (women might not take pill from clinic).
- Stock might run out.
- Corruption can exist, where these pills might be sold in communities who did not have access or did not have access in time.
- Women might misplace, or not be able to take medication post-delivery – very difficult to ensure and to monitor adherence to the medication
- May generate severely negative side-effects for some mothers if administered on a blanket basis – has the pill been sufficiently tested?
- CBA difficult to put a monetary value on benefit, especially as many of these women might not be working/ contributing financially towards economy. A different measure might be used, ie the reduction to cost on state due to increased orphans due to loss of mothers lives.
- Voters may feel that this is a waste of taxpayers' money, and that there are better causes to fund, causing the government to lose votes.

[Half mark each, Max 6]

QUESTION 3

Part (i) was a bookwork question with easy marks available for application, a disappointing number of candidates did not know their bookwork well enough to score all available marks and an even higher number did not apply their solution to the question, discussing the appropriateness of insurability characteristics in general and not the impact of the campaign on these as asked.

For part (ii) a large number of candidates assumed that hearing loss is a new condition added to CI despite the question stating to consider companies (already) selling CI that covers loss of hearing. Many candidates gave very general answers about risks and did not attempt to apply this to the specifics of the question.

i.

Characteristic	Impact of campaign on Hearing loss as CI event
It is a condition <u>perceived by the public to be serious</u> ✓	The campaign might increase the awareness of hearing loss, however early diagnosis might result in an increase in less severe cases being diagnosed. Perception might thus be that hearing loss is less severe. ✓
and to <u>occur frequently</u> ✓	The campaign might increase the rate of diagnosis, as well as accelerate the timing of diagnosis, thus increasing the frequency of it occurring. ✓□
The condition covered can be <u>defined clearly</u> so that there is no ambiguity at time of claim. ✓	There should be no change in definition of hearing loss required to trigger a CI claim. ✓ There should be no confusion as to the level of hearing loss that would trigger a claim at such a time.
<u>Sufficient data</u> are available to price the benefit. ✓	Sufficient data might not be immediately available to price the impact of online testing correctly, however this data might be accumulated over time.

	✓
The ability to <u>avoid anti-selection</u> . ✓	This characteristic might prove to be more difficult to be met due to lack of control over timing and quality of testing and the validity of the test results, but appropriate contract design could eliminate a significant proportion of this risk. ✓ Perhaps the campaign will increase the incidence of anti-selection. People can now test themselves without the knowledge of the insurer and then apply for cover without the insurer having any knowledge of their test result. ✓

[Max 5, half mark per characteristic, half mark per appropriate impact suggested]

ii.

The extent of the risk depends on the size of CI claims due to hearing loss and the potential increase in CI claims due to the roll out of the campaign. ✓✓

It is highly likely that the campaign will drive up the incidence of claims for hearing loss. ✓

(Tick for risk, tick for mitigation, max 1 mark per risk plus mitigation. Marks were awarded where these were listed separately but relatable)

Increase in in claims frequency (actual)

- Actual number of claims increase due to people testing positive for hearing impairment in HR test and also meeting insurer's definition
- Mitigation: Increase Reserves backing liabilities (Or other valid mitigation considered)

Increase in claims frequency (fraud)

- People claiming to meet impairment definition due to HR results, however falsifying results..
- Mitigate: Require validation test that Insurer has control over to validate claim.

Reputational risk

- People might think they qualify for a claim subject to results of HR campaign, however this might not meet the definition of the insurer.
- Mitigation: Increase education and awareness to policyholders of claims definitions/ ensuring policy wording is clear and early understandable.

Anti-selection

- People now have easy access to know the true level of hearing impairment due to HR campaign and might take out a policy covering hearing impairment with the knowledge of existing impairment without disclosing this to the insurer.
- Mitigation: Allow for this in Underwriting requirements (Stricter UW/ Use HR test as part of UW/ Exclude pre-existing condition/ access to HR data base to confirm if applicant has been tested)

Selective lapsing

- Policyholders who were previously concerned about potential hear loss might now confirm

from the HR tests that they are not at risk, these healthier lives might decide to cancel leaving a higher risk pool insured.

- Mitigation: Provide sufficient incentives for continuation, for example no UW required upon renewal for them business/ ensure pricing is sufficient and policy provides value to customer (likely includes a whole list of conditions in addition to hearing loss)/ Make sure premiums remain competitive (Competitor analysis)

Increased expenses

- Company might incur additional expenses from needing to put in place additional checks at claims stage potentially to confirm HR results/ Increased marketing required to clarify claims definitions to reduce reputational risk etc.
- Mitigation: Allow for this on existing business by increased reserves and for new business in the pricing of the contracts.

Incorrect pricing (New business)

- Company might change the premium for new business to allow for the potential increased claims cost expected following this campaign, however might result in a premium too large (uncompetitive, or too low, unprofitable)
- Mitigation: Include sufficient markings/ improve accuracy with data from HR campaign/ allow for premiums to be reviewable./ Reinsurers might be a source however if the change is due to the HR campaign that has been introduced and it is a first, they might not have more data available on the potential change.

Other

Problems with the test in general need to be considered, e.g. quality of computer and or connection used and how to overcome this to result in standardized results. ✓✓

Can decide to not offer hearing loss as a critical illness benefit trigger to avoid the problems therewith. ✓

[Max 5]

QUESTION 4

Part (i) was reasonably well answered although some candidates stated that investment risk did not apply where there was a single premium. For part (ii) many candidates provided generic responses without reference to the existing medical expense cover and the specific factors important for immediate needs long term care policies. The mark allocation indicated that a more detailed response would be appropriate describing the specific assumptions that would be required.

i. 5 marks

- major risk is transfer probabilities between claim states
 - for pre-funded this includes the risk of claim inception
 - for immediate needs it is increase in severity
- another risk is investment risk
 - this is post inception for immediate needs since usually single premium
 - more pre-inception for pre-funded as there may be unit-linked element
- also longevity risk for claims in payment
- and expense risk

- selective withdrawals for pre-funded
- risk of guarantees not being met
- marketing/reputation risk from policyholders expectations not being met.

ii. 8 marks

Considerations for assumptions:

- Purpose – reserving may be more prudent than pricing
- Nature of benefits – cost of care (indemnity) or cash

Mortality

- Unlikely to have own data
- reinsurance assistance may be available
- also consider underwriting process being applied – assessment of impairment
- and marketing strategy in terms of demographics of target market
- will need a margin for prudence (lower mortality per condition)
- Likelihood for increased severity if levels of cover or care cover

Claim amount and inflation

- Relevant for indemnity type cover
- Consider availability of care – facilitates vs. informal care
- Trends in costs and levels of care required (medical technology)

Expenses

- Own data not available so will need to consider existing products
- Conduct expenses analysis by policy type, initial/renewal, fixed/variable
- Consider per policy or percentage of cover
- Allow for fixed expense contribution depending on future new business

Interest

- Depends on investment strategy
- Consider matching of assets
- Likely return per asset class
- Reinvestment risk on pre-funded product especially
- Need margin for prudence (reduced return)

Taxation

- Allow for future tax at current rates (or allow for known changes)

Other factors

- solvency margin
- for pricing competitors rates
- sensitivity tests

QUESTION 5

Part (i) was reasonably well answered although some candidates did not provide sufficient detail on the cashflow calculation. A “how” question usually requires detail on the steps to be follows. Some candidates just identified risks without setting out how they would be assessed. For part (ii) candidates needed to recognize that the question was considering the difference in the experience of the different books in the future. The environmental factors such as regulations and state provision would apply to both and thus it was specifically required to assess the product specific factors that would affect the differences in experience.

i. 7 marks

- choose model points appropriate for new portfolio

- may have previous profitability assessment that can be updated for new business and lapses
- Compare to regulatory reserves and published reserves
- Compare key assumptions to own reserving basis
- project cashflows from existing business
- Set appropriate assumptions for these cashflows – obtain past data from the competitor, supplement where necessary with other data;
- critical to understand competitor’s policies’ terms and conditions, underwriting standards, etc.
- income for premiums and income on reserves
- claims expenses
- management expenses (on current and own basis) – acquisition price based on current
- allow for reserves and solvency requirements
- allow for taxation
- discount at rate allowing for risk of variation
- and required return by acquiring company
- consider cost of any options or guarantees
- Statistical risk can be assessed:
 - by variances in individual parameter values
 - deterministic sensitivity analysis
 - stochastic models for certain parameters
 - By any available market data (volatility implied therein)
- Scale up for all model points for expected profit

ii. 7 marks

Differences in the experience can be caused by:

- differences in product design
 - definition of conditions
 - tiered benefits
 - guarantees
 - exclusions
 - reinstatements
 - additional benefits
 - maximum levels of cover
- differences in underwriting practices
 - use of medical information
 - levels of cover for which underwriting is required
 - extent of policy limitations e.g. loadings, waiting periods applied
 - extent of denial of cover
- Differences in claims management provided for in the pricing
- profile of covered lives
 - mix by age, gender, occupation, region
 - can be caused by differences in marketing practices
 - distribution channels
- lapse rates
- selective lapses will mean poorer health status of remaining lives
- economies of scale achieved by administering acquired book by larger company

QUESTION 6

It is important that the candidates apply their points to the specifics of the question in order to gain credit. Part (i) was reasonably well answered but candidates needed to explain the risks rather than just stating them. For part (ii) good candidates commented on how risk mitigation measures may affect the marketability of the product and the impact on business volumes, as well as the need to balance cost and effectiveness. Some candidates referred to hospital reimbursement measures which were not appropriate for a hospital cash plan. For part (iii) candidates tended to provide generic answers describing a burning cost approach. The key requirement was to address the specific adjustments i.e. that additional data would be required on shorter-stay admissions and that a clear definition of emergency admissions was required and the ability to classify historic data on this basis.

i.

Key risk is the number of admissions (frequency), specifically the number of admissions that are longer than the deferred period.

There is also claim risk associated with longer admissions.

There may be anti-selection if people join the affinity group in order to obtain cover. This could be affected by how the affinity groups market their membership.

This will also affect the mix of business. If the age/gender/health status profile of the membership differs from that expected, the flat rate may not be adequate.

There is volume risk if the affinity group membership expands too rapidly for the capital of the insurer to support the risk.

And also if it grows too slowly for the insurer to have enough volume to cover the fixed expenses.

There is competition risk if the affinity groups choose to partner with other insurers offering more competitive products in terms of price and/or benefits.

There is regulatory risk associated with how hospital cash products are sold and the nature of benefits they may offer.

There are internal risks associated with the operating expenses of the product, claims management and customer service.

There is reputational risk associated with the affinity groups and their ability to attract and retain membership and also the aggregation risk that may be associated with this business.

ii.

The health insurer can enter into a reinsurance agreement to share claim-related risk. A quota share arrangement will share risk associated with the frequency of claims and enable the insurer to write more business than capital supports.

An excess of loss agreement will share risk associated with longer admissions.

Effective claims management can also assist in managing longer admissions.

The agreement with the affinity group can include requirements associated with volumes, mix and aggregation for the flat rate to be valid i.e. include levels of variation in these measures which would trigger a review of the flat rate.

This may also include how the affinity groups market to their members.

Sensitivity testing of the flat rate to variations in age/gender/health status profile to ensure that margins are adequate.

Internal controls to manage expenses and ensure that internal procedures are resilient to fraud.

May consider alternative sales channels to increase business volume from other sources (and diversify the relationship and reputational risks associated with the affinity groups).

iii.

The best source of data will be internal data.

The insurer will need to identify emergency admissions in the current data to assess proportion eligible for the greater benefit.

The insurer can use own admission data to price for the additional day of cover.

But will need to use external data sources to assess the number of new admissions eligible for cover.

Use of own data may need to take account of the type of policyholder more likely to opt for the new cover e.g. higher earning, more health risk, older.

The insurer could approach a reinsurer for assistance with this or use industry data if this is available.

So pricing model needs to be adjusted for larger number of admissions (due to shorter deferred period) and higher benefit amount (on emergency admissions)

Need to ensure that expense loadings are adequate to cope with higher volumes and also the need to assess claims against the definition of an emergency.

Need to ensure sensitivity tests are done for all assumptions.

And that competitive products are considered and regulatory requirements are met.

QUESTION 7

Part (i) was generally well-answered, but many candidates lost easy marks by considering only how the government can save on their own medical expenditure (subsidies), and not considering how they can bring costs down for the entire industry. Part (ii) was generally well-answered. Part (iii) was poorly answered overall. Candidates were given credit for explaining the mechanics of determining case mixes and applying risk adjustment and why this is necessary. But almost no candidates went further into explaining how to group the data by risk factors, and allow for consistency across providers, allowing for differences in conventions, etc. to ensure no under- or double-counting, and that when risk adjustment is applied, it is done on demand-side characteristics, bearing in mind quality of care. Part (iv) was generally well-

answered. Stronger candidates identified the effect of reputational damage on the rest of the insurer's offering. Part (v) was poorly answered – this was a higher-order practical question with easy marks available for merely outlining any of a vast number of measures that can be used to judge the quality of care/treatments. Better candidates scored well here, coming up with very sensible points. Part (vi) was bookwork which was well-answered by those who knew the bookwork.

i.

- Monetary policy measures to stabilise the economy, e.g. raising interest rates to combat currency depreciation can aid in reducing the cost of imports of technology
- Fiscal policy measures, e.g. directing more money in the form of subsidies to hospitals can alleviate the burden of expensive healthcare to individuals. This would however only transfer a portion of the increased costs from individuals to Government, rather than reduce the increases
- Investment into R&D and/or local industry development could reduce the reliance on foreign and expensive technology, however, this will have a long delay before the cost reductions are realized
- Regulations can be introduced requiring stricter hospital expense and wastage control
- Policies and procedures aimed at rationing care so as to avoid unnecessary treatments being performed
- Increase accessibility to all for Primary Health care to reduce potential downstream costs which would be higher
- Incentives to keep medical professionals in the country or attract foreign professionals (in the longer term this will result in cost-savings as supply increases): [max $\sqrt{\sqrt{}}$]
 - Monetary
 - Leave and other benefits
 - Study support with lock-in clause
- Marketing healthy lifestyles and their benefits to reduce the future incidence of chronic lifestyle diseases which are costly to manage
- Chronic condition awareness and management to avoid costly hospital admissions
- [$\sqrt{\quad}$ per point plus $\sqrt{\quad}$ per suitable example, max 5]

ii.

- Admissions data from the hospitals
- Diagnosis and secondary diagnoses (if applicable) for the admissions
- Consultation information from the primary care providers
- Exposure Information (Number of lives that are in the region serviced by each hospital/primary care provider)
- Demographic information (geographical region, average age, chronic condition prevalence, etc.) for the different hospitals and providers
- Facility information (Size, speciality facility, policies and procedures, etc.)
- Network footprint, i.e. number of facilities across the country
- Treatments/procedures offered by various providers
- Average cost of treatments/procedures per provider
- Rate of complications, or other cost compounding events related to procedures/treatments
- Amount of government subsidies received by each provider
- Staff salaries/wages for the different providers

- Other expenses' information
- [√each plus max √ for an appropriate example, max 4]

iii.

- Would need to compare the average cost of treatment for average basket of treatments by provider type
- The average cost per provider would need to be adjusted so that comparisons are like-for-like, particularly around:
 - Risk profile of people using that provider (age, gender, geographic region, disease burden)
 - Diagnoses of those claiming (and any secondary diagnoses or other complications)
 - The effectiveness of treatments (although this would not be easily obtained)
- There are many different conditions for which individuals may seek treatment, and depending on circumstances different treatments/procedures may be performed for persons with the same condition, i.e. chemo vs surgery based on age
- Different hospitals may have different naming conventions/coding standards, etc.
- It is important that this vast amount of information be grouped in a sensible way, and that this is done consistently across different providers, e.g. diagnosis-related groups
- It is important that these groups are mutually exclusive and exhaustive to ensure no double- or under-counting
- Grouping by relevant and available risk factors is important
- An alternative would be to use Adjusted clinical groupings which is not disease specific, but looks at the expected resource utilisation of patients
- Different providers will be exposed to different subsections of the population and as such is likely to have very different risk pools
- It is important to apply risk adjustment techniques to adjust for differences in the risk profiles
- Bear in mind that only underlying patient demand characteristics should be adjusted for
- Also, bear in mind the importance of quality of care when performing the risk adjustment exercise
- Upon having completed the risk-adjustment exercise, and having comparable risk profiles, the average cost per grouping (given the grouping methodology chosen) can be determined, and a comparison can be made across all providers of who the most cost-effective is
- Expenses, salaries, etc. should be apportioned to the groups in a sensible way, bearing in mind to do this consistently between providers
- [√ each, max 5, other valid approaches/steps may be possible and should be given credit]

iv.

- Poor quality treatments can lead to higher hospital bills (claims) due to
 - Increased length of stay – slower recovery
 - Multiple admissions – patients returning
 - Poorer quality can also result in resource wastage
- LifeETC may suffer reputational damage if policyholders perceive that the company is only willing to pay for the cheapest/lowest quality care
- May lead to intervention from regulator, i.e. minimum standards being set

- There is a risk of legal proceedings against LifeETC if the policyholders receive low quality care because of T's & C's within the PMI policy
- Poor quality care can lead to increased deaths, and thus claims under their life insurance book, especially if there is lots of cross-selling to existing life policyholders
- Genuine concern for the well-being of policyholders
- [✓each, max 3]

v.

- Patient/Family feedback questionnaires
- Number of secondary infections contracted in hospitals
- Number of ICU deaths vs discharges
- Average length of hospital stays per diagnosis
- Number of relapses within x days per diagnosis
- The existence of protocols, policies and procedures and the adherence to these
- Staffing – level of seniority, skills, number of vacancies, etc.
- Length of waiting lists
- Availability of rehabilitative programs and other measures/services aimed at reducing length of stay or increasing patient comfort
- Up-to-date-ness of technology and/or procedures
- General upkeep of facilities, equipment, etc.
- [✓each. Give credit for other sensible ways in which quality can be measured, max 5]

vi.

- Budgeting (allocating its subsidies)
- Measuring efficiency of different providers
- Risk management
- Measuring healthcare outcomes (quality)
- Creating provider profiles
- Reporting on costs, outcomes and future plans
- [✓ each]