
SOCIETY OF ACTUARIES
Group & Health Specialty Exam

Exam GHSPC

Date: Friday, April 28, 2017
Time: 2:00 p.m. – 4:15 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 40 points.

This exam consists of 5 questions, numbered 1 through 5.

The points for each question are indicated at the beginning of the question.
2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.
3. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.
3. The answer should be confined to the question as set.
4. When you are asked to calculate, show all your work including any applicable formulas.
5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate Exam GHSPC.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

Tournez le cahier d'examen pour la version française.

****BEGINNING OF EXAMINATION****

- 1.** (6 points) You are a consulting actuary who has been asked by ABC Health Insurance Company to develop an Actuarial Appraisal related to the potential acquisition of DEF Health Insurance Company.

You have explained to ABC's leaders that the four key components of an Actuarial Appraisal are:

1. Adjusted net worth of the business as of the valuation date
2. Value of the business in force
3. Value of future business capacity
4. Adjustment for future cost of capital retained to support the business

ABC's leaders are knowledgeable about all of the components, except for the second component.

Define and describe in full detail the steps for determining the value of the business in force.

2. (10 points)

(a) (3 points)

- (i) Describe risk characteristics that should be considered when developing a risk classification system.
- (ii) Describe items an actuary should consider when establishing risk classes.

As part of your state’s healthcare reform, risk adjustment will be used for the individual products in the commercial market.

The risk adjustment program uses the following variables:

- 1. Plan Types
- 2. Geography
- 3. Risk Factor

The State uses a methodology similar to how Massachusetts calculated risk adjustment in 2011.

You have been given the following information:

1st Quarter 2017 Rating and Risk Model Information

Plan Type Relative Values	
Plan Type	Plan Factor
I	1.07
II	0.98
III	0.91
Actuarially Sound Rate	\$445.00
Administration Fee	\$39.00
Geographic Area Rating Relativities	
Region	Rating Factor
West	1.1
Central	1.0
North	0.94
South	0.98

2. Continued

Your plan has the following demographics for 4th quarter, 2016:

Member ID	Region	Plan Factor	Risk Factor
1	North	II	0.8
2	North	II	0.8
3	North	II	0.8
4	North	III	1.5
5	North	III	1.5
6	North	III	1.5
7	Central	I	1.3
8	Central	I	1.3
9	West	III	0.9
10	West	III	0.9

- (b) (3 points) Calculate the initial average PMPM payment to your plan for first quarter of 2017. Show your work.
- (c) (1 point) Describe the reconciliation process for the first quarter of 2017, and the payment calculation for the remainder of 2017.
- (d) (2 points)
- (i) Describe the several ways to judge the quality of a model.
 - (ii) Critique the above risk model with respect to the several ways as answered in (i).

You have been asked to comment on using drug data to enhance the risk adjustment process.

- (e) (1 point) Describe the features of drug-based risk adjustment models.

3. (8 points)

- (a) (1 point) Describe the advantages of ICD-10 over ICD-9 that will assist insurers in their risk management efforts.

You are given the distribution of 2015 claims by ICD-9, with 100,000 member months in 2015:

ICD-9 Code	2015 Claim Count	2015 Incurred Claims PMPM
123	23	\$20
214	567	\$32
345	33	\$80
466	122	\$44
702	104	\$140
865	577	\$68
V92.9	89	\$16
TOTAL	1,515	\$400

Under the mapping from ICD-9 to ICD-10, your Chief Medical Officer informs you that your 2015 claims experience should be mapped as follows for ICD-9 Code 865, Suture of Skin:

ICD-9 Code	Disease	ICD-10 Code	ICD-10 Description	2015 Claim Count	2015 Average Unit Cost
865	Suture of Skin	OJQ10ZZ	Repair Face Subcutaneous, Open	220	\$9,210
		OJQ13ZZ	Repair Face Subcutaneous, Percutaneous	130	
		OJQ40ZZ	Repair Anterior Neck Subcutaneous, Open	145	\$5,760
		OJQ43ZZ	Repair Anterior Neck Subcutaneous, Percutaneous	82	
	TOTAL			577	

Your Chief Medical Officer informs you that the Percutaneous average unit cost is double the Open average unit cost for repairing the Anterior Neck.

- (b) (2 points) Calculate the cost relationship between Percutaneous and Open for repair Face Subcutaneous, based on 2015 data. Show your work.

3. Continued

You are modeling capital requirements for Risk-Based Capital (RBC) for a mid-sized health insurer. You are given the following:

H ₀	\$200,000
H ₁	\$2,300,000
H ₂	\$6,000,000
H ₃	\$500,000
H ₄	\$800,000

The capital required for underwriting risk is set at 15% of incurred claims in 2015, which were aggregated based on ICD-9 diagnosis codes.

In your model, you assume that 20% of the Open procedures will be up-coded to Percutaneous procedures.

- (c) (5 points) Calculate the initial RBC for 2015 and the change in 2015 RBC due to up-coding. Show your work.

4. (10 points) You work as a pricing actuary for a small block of Individual Long Term Disability Insurance, called IJK, which has been sold for the past 8 years. Two years ago your company changed the product's contract from 'any occupation' to 'own occupation' without changing pricing or underwriting. Otherwise the IJK product has remained unchanged. Your manager has asked you to determine whether any pricing adjustments are needed on IJK.

(a) (2 points)

- (i) Identify the four most important pricing assumptions you should consider when pricing disability insurance.
- (ii) Contrast the importance of those four assumptions of an LTD product compared to a major medical product.

You have access to three sets of morbidity tables: a SOA Group LTD table, a SSA Morbidity Table, and a 2-year old morbidity experience study of the IJK product.

(b) (2 points) Evaluate advantages and/or disadvantages of each of the three available morbidity tables for IJK.

Management has approached you to discuss confidence intervals when examining the IJK morbidity experience study.

(c) (3 points)

- (i) Assess considerations that should be contemplated.
- (ii) Recommend an approach for determining a confidence interval for DI business. Justify your answer.

The sales department believes there is significant consumer interest in an individual LTD product marketed specifically to dentists. Your company perceives the current market as worthwhile and is eager to explore this opportunity to expand its market presence.

(d) (2 points) Describe the various roles of internal departments that should be represented on the product development team.

Your manager is concerned that the proposed product is too risky, so she has asked you to include a maximum replacement ratio limitation into the contract.

(e) (1 point) Justify whether or not you believe this feature will be effective in limiting the company's risk.

5. (6 points)

- (a) (1 point) Describe the concept of a reinsurance commutation.

The Affordable Care Act (ACA) has had many impacts on both reinsurance and Risk Based Capital (RBC) ratios.

- (b) (2 points) Describe all the major impacts the ACA has had on medical reinsurance.

The ACA introduced reinsurance, risk corridors, and risk adjustment programs to reduce variability in the individual and small group markets.

- (c) (1 point) List and explain the causes of uncertainty after implementation of the ACA even with these programs.
- (d) (2 points) There are several impacts of the ACA on your business that may affect your RBC ratio.

Evaluate the directional impact of each of the following potential items on the RBC ratio. Assume they are independent unless otherwise noted. Justify your answers.

- (i) Actual premium is 5% higher, assuming no changes to claims.
- (ii) Enrollment stays stable into the future, while both premium and claims increase by 4% per year, and administrative expenses remain at 11% of premium.
- (iii) Enrollment increases 50% with no change to administrative expenses.
- (iv) Knowing the impact of (iii), the additional change of breaking administrative expenses into fixed and variable costs.

****END OF EXAMINATION****

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