
SOCIETY OF ACTUARIES
Group and Health – Advanced

Exam GHADV

MORNING SESSION

Date: Thursday, April 27, 2017

Time: 8:30 a.m. – 11:45 a.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).
 - a) The morning session consists of 8 questions numbered 1 through 8.
 - b) The afternoon session consists of 7 questions numbered 9 through 15.

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 morning or afternoon session for Exam GHADV.
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****
Morning Session

- 1.** (7 points) You are the valuation actuary at ABC Insurance. ABC specializes in providing group Long-Term Disability (LTD) coverage.
- (a) (2 points) List the components of LTD reserves and describe the methodologies to evaluate each of them.
- (b) (2 points) List the guidelines and standards of practice that apply to the calculation of LTD claim reserves.

You are given the following:

Month	Reported Claims as of 12/31/2016 (in \$000)	Completion Factors
7/2016	\$1,200	100.0%
8/2016	\$1,000	75.0%
9/2016	\$650	50.0%
10/2016	\$350	30.0%
11/2016	\$250	20.0%
12/2016	\$125	10.0%

- Target Loss Ratio = 80%
 - Monthly Premium = \$1,500,000
- (c) (2 points) Calculate the incurred but not reported (IBNR) reserve as of 12/31/2016 using the following combination methods:
- (i) Loss ratio method for October 2016 to December 2016 and Lag method for July 2016 to September 2016.
- (ii) Lag method for October 2016 to December 2016 and Loss ratio method for July 2016 to September 2016.
- Show your work.
- (d) (1 point) Recommend one of the two combination methods for evaluating IBNR claims on ABC's LTD block. Justify your answer.

2. (6 points)

- (a) (2 points) Describe the components of the Value Chain used to develop a care management program.
- (b) (1 point) Describe Opportunity Analysis as it relates to developing a care management program.
- (c) (2 points) Critique models for member stratification used to create a care management program.

You are given the following regarding the economic impact of an intervention:

Penetration Percentage	Net-Net Opportunity (\$000)
0.0% to 0.1% segment	\$7,000
>0.1% to 0.2% segment	\$5,000
>0.2% to 0.3% segment	\$3,000
>0.3% to 0.4% segment	\$1,500

- Intervention cost is \$1,000,000 per 0.1% segment
 - Required return on investment is 5:1
- (d) (1 point) Calculate the percentage of the population that should be targeted to maximize the overall savings amount. Show your work.

3. (10 points) You work for JKL Insurance. JKL is negotiating a contract renewal with Hospital Z. The current contract between JKL and Z sets payments using DRG/case rates.

- (a) (1 point) List the market forces that drive providers toward payment reform.
- (b) (2 points) List the key players on the payment reform team and describe the role each plays in the payment reform process.
- (c) (1 point) Describe the following types of risk considered in evaluating payment models:
 - (i) Utilization risk
 - (ii) Technical risk
 - (iii) Insurance risk
 - (iv) Performance risk

JKL narrows its contracting focus to bundled payments and reference pricing.

- (d) (2 points) Describe:
 - (i) Bundled payment models
 - (ii) Reference pricing models
- (e) (4 points) Compare and contrast the following to the current payment model using the four types of risk identified in part (c).
 - (i) Bundled payment models
 - (ii) Reference pricing models

4. (7 points) You are the pricing actuary for XYZ. In 2018, XYZ will introduce a new High Deductible Health Plan (HDHP) alongside the current PPO plan being offered in 2017. No other plans are offered.

- (a) (1 point) Describe situations where insurers and employers take advantage of a multiple choice environment.
- (b) (2 points) Describe the steps to develop monthly premiums for group medical products offered in a multiple choice environment.

You are given the following:

PPO Plan Enrollment	PPO Relative Health Status Factor	HDHP Relative Health Status Factor	Overall Health Status Factor*
>79%	105%	55%	100%
60%-79%	113%	70%	100%
50%-59%	121%	74%	100%
40%-49%	129%	76%	100%
20%-39%	137%	84%	100%
<20%	145%	95%	100%

* weight based upon midpoint of PPO plan enrollment range

Enrollment		
	PPO	HDHP
Expected	70%	30%
Actual	90%	10%

- The 2018 PPO premium rate before selection is \$600 per member per month (PMPM).
 - The HDHP is expected to have a cost that is 80% of the PPO plan before any selection bias.
 - 1,000 members are expected in 2018.
- (c) (1 point) Calculate the 2018 monthly premiums for the PPO and HDHP plans. Show your work.
 - (d) (2 points) Calculate the aggregate premium surplus/deficiency based on actual enrollment. Show your work.
 - (e) (1 point) Recommend two ways XYZ can manage selection and its financial impact. Justify your response.

5. (9 points)

- (a) (1 point) List the common measurement issues in the development of a disease management (DM) program study design.

You are given the following study design methods:

- Pre-post cohort
- Regression discontinuity
- Participant vs. non-participant
- Services avoided
- Randomized control group

- (b) (5 points)

- (i) Define each method.
- (ii) Identify each method as a control group, non-control group, or statistical method.
- (iii) Rank the study design methods from most appropriate to least appropriate for evaluating the outcomes of a DM program. Justify your rankings.

You are given the following:

	Reference Population	Intervention Population
Baseline Period Cost Per Member Per Month (PMPM)	\$2,500	\$3,000
Intervention Period Cost PMPM	\$2,400	\$2,600
Average Members	3,000	1,000
Program Cost PMPM	N/A	\$200
Required Hurdle Rate	N/A	1.65

- (c) (2 points) Evaluate the outcome of the DM program using:
- (i) The required hurdle rate. Show your work.
- (ii) The Risk Management Economic Model.
- (d) (1 point) Recommend changes to improve the financial results of the DM program. Justify your response.

6. (7 points) Health Plan ABC has a fee-for-service (FFS) contract with Provider GHI. ABC proposes that GHI implement two disease management (DM) programs:

- DM Program 1 will reduce hip replacement admissions
- DM Program 2 will reduce the severity of professional services associated with hip replacement admissions

(a) (2 points) Create a chart showing the impact of DM Program 1 on provider profits for the various payment models.

You are given:

Baseline Period	Hip Replacement Admissions	Professional Services
Units per 1,000 members per year	5	8
Cost per Unit	\$25,000	\$5,000
Utilization Trend	4%	4%
Cost Trend	2%	2%

- DM Program 1 will cost ABC \$1,000,000 and eliminate 20% of hip replacement admissions.
- DM Program 2 will cost ABC \$125,000 and reduce the cost per unit for Professional services by 5%.
- ABC has the same 50,000 members in the baseline and intervention periods.

(b) (2 points) Calculate net claim savings using the Actuarially-Adjusted Historical Control Methodology for:

- (i) DM Program 1
- (ii) DM Program 2

Show your work.

(c) (1 point) Recommend which DM program(s), if any, ABC should implement. Justify your response.

6. Continued

ABC proposes changing its contract with GHI for hip replacements to either a capitation arrangement or a bundled payment arrangement. The bundled payment will cover the costs of both inpatient facility charges and professional services. GHI has agreed to implement both DM programs.

- (d) (2 points) Calculate, ensuring GHI maintains the same total revenue as under the current payment arrangement:
- (i) the minimum capitation rate GHI should accept.
 - (ii) the minimum bundled payment rate GHI should accept.

Show your work.

7. (10 points)

- (a) (2 points) Describe the criteria used to screen, approve, and classify large group prospects.

You are responsible for the financial viability of a block of Group Health Stop Loss Policies of Better Health Insurance Company (BHIC).

- (b) (2 points) Describe the rating considerations related to Specific Stop Loss.
- (c) (2 points) Compare and contrast the product variations of:
- (i) Specific Stop Loss contracts
 - (ii) Aggregate Stop Loss contracts

You are given the following:

- Expected total losses Per Employee Per Month (PEPM) \$400
- Expected number of employees per month 240
- Aggregate Attachment Factor 120%
- Minimum Attachment Factor 90%
- Specific Stop Loss Deductible \$250,000

Actual Loss Information:

- Employee Months 3,000
- Total losses \$1,600,000

Total Per-person Cumulative Losses Exceeding \$250,000	Gross Claim Value
Person A	\$300,000
Person B	\$375,000
Person C	\$425,000

- (d) (2 points) Calculate the losses reimbursed under this stop loss contract. Show your work.
- (e) (2 points) Describe other types of special funding arrangements.

8. (4 points) Your company has engaged with two Employee Health Management (EHM) vendors.

EHM Vendor A's marketing material promises a return on investment (ROI) of 2:1. You are given the following for 2016:

• Average Members	1,000
• Hospital Admissions	43
• Hospital Days	96
• Hospitalization Costs	\$1,000,000
• EHM per member per month (PMPM) Fees	\$0.75

- (a) (1 point) Calculate the reduction in the number of admissions necessary to achieve the stated ROI. Show your work.
- (b) (1 point) Describe the inadequacies of using the reduction in the number of admissions to calculate ROIs.

You are given the following information for Vendor B's EHM program:

Trend Component	Prospective Expected	Retrospective Actual
Demographic Changes	1.0%	0.5%
Risk Factors (net of demographics)	1.0%	0.0%
Unit Prices	3.5%	3.0%
Utilization	1.5%	1.0%
Plan Design	-1.0%	1.0%

- Baseline PMPM: \$250
 - Performance Period PMPM: \$265
 - Members subject to program: 15,000
- (c) (2 points) Calculate the total annual savings provided by this program by comparing the adjusted-expected whole-population cost trend to actual cost trend. Show your work.

****END OF EXAMINATION****
Morning Session

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