

Exam GHDP A

Date: Tuesday, May 4, 2021

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 7 questions numbered 1 through 7 with a total of 60 points.

The points for each question are indicated at the beginning of the question. Question 4 pertains to the Case Study.

2. 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 provided in this document.

Written-Answer Instructions

1. Each question part or subpart should be answered either in the Word document or the Excel file as directed. Graders will only look at work in the indicated file.
 - a) In the Word document, answers should be entered in the box marked ANSWER. The box will expand as lines of text are added. There is no need to use special characters or subscripts (though they may be used). For example, β_1 can be typed as beta_1 (and ^ used to indicate a superscript).
 - b) In the Excel document formulas should be entered. Performing calculations on scratch paper or with a calculator and then entering the answer in the cell will not earn full credit. Formatting of cells or rounding is not required for credit, as long as your work and assumptions are clear to an individual with average Excel experience reviewing the submitted file.
 - c) Individual exams may provide additional directions that apply throughout the exam or to individual items.
2. The answer should be confined to the question as set.
3. Prior to uploading your Word and Excel files, each file should be saved and renamed with your five-digit candidate number in the filename.
4. The Word and Excel files that contain your answers must be uploaded before time expires.

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Navigation Instructions

Open the Navigation Pane to jump to questions.

Press Ctrl+F, or click View > Navigation Pane:



CASE STUDY INSTRUCTIONS

The case study will be used as a basis for some examination questions. Be sure to answer the question asked by referring to the case study. For example, when asked for advantages of a particular plan design to a company referenced in the case study, your response should be limited to that company. Other advantages should not be listed, as they are extraneous to the question and will result in no additional credit. Further, if they conflict with the applicable advantages, no credit will be given.

1.

(6 points)

(a) (3 points) Explain how each of the following complicate the application of traditional credibility models to Long Term Disability (LTD) Coverage:

(i) Non-independence of claims

ANSWER:

(ii) Heterogeneous risk classes

ANSWER:

(iii) Claim duration

ANSWER:

1. Continued

You a reserving actuary for Insurer ABC. You are given:

LTD Claim Duration	Selected Variance Factor
4-24 Months	4.0
25-60 Months	3.0
61-120 Months	2.5
Greater Than 120 Months	2.0

Duration Year	Expected Claim Terminations	Policy A Experience Rate	Manual Rate
1	3,450	\$50,000	\$45,000
2	3,500	\$52,500	\$45,200
3	2,750	\$52,500	\$49,900
4	2,250	\$55,000	\$42,900
5	1,750	\$35,000	\$34,000
6	1,500	\$35,000	\$33,300
7	1,250	\$35,000	\$32,600
8	1,000	\$35,000	\$31,500
9	850	\$30,000	\$30,100
10	800	\$27,500	\$25,200
11	750	\$22,500	\$24,300
12	650	\$20,000	\$23,400
13	600	\$17,500	\$23,100
14	550	\$15,000	\$20,600
15	500	\$12,500	\$19,800

- (b) (2 points) Calculate the Credibility Adjusted Reserve for Policy A. Show your work.

The response for this part is to be provided in the Excel spreadsheet.

- (c) (1 point) Explain the risks associated with reserve setting if credibility is not properly considered.

ANSWER:

2.

(9 points)

(a) (2 points) Describe the utilization, technical, insurance, and performance risks for each of the following provider payment models:

(i) Fee-for-service

ANSWER:

(ii) Global capitation

ANSWER:

(iii) Case rates

ANSWER:

2. Continued

You are an actuary for GHI Insurance. You are given for 2020:

- GHI's provider network includes Hospital A and Hospital B
- GHI's enrollment is 5,000 members
- Hospital A receives a capitation payment of \$2 PMPM for each of GHI's members
- Hospital B is paid 65% of billed charges
- Claims for Hospital B:

Claim	DRG	DRG Description	DRG Weight	Service	Days	Units	Billed Amount
1	795	Normal Newborn	0.157	Delivery Room	2	1	\$5,000
1	795	Normal Newborn	0.157	Laboratory	2	3	\$200
1	795	Normal Newborn	0.157	Pharmacy	2	60	\$1,500
2	787	C Section	1.053	Delivery Room	4	1	\$6,000
2	787	C Section	1.053	Pharmacy	4	300	\$3,000
3	794	Neonate w/ complications	1.164	Cardiology	11	4	\$1,000
3	794	Neonate w/ complications	1.164	Pharmacy	11	350	\$7,000
3	794	Neonate w/ complications	1.164	X-Ray	11	8	\$800
3	794	Neonate w/ complications	1.164	Delivery Room	11	1	\$5,000

(b) (2 points) Calculate:

- Hospital A's 2020 reimbursement
- Hospital B's 2020 reimbursement under the discount arrangement
- Hospital B's reimbursement under a proposed case rate equal to \$4,500 per birth

Show your work.

The response for this part is to be provided in the Excel spreadsheet.

2. Continued

GHI and Hospital B agree to adopt a DRG-based reimbursement structure for 2021.

- Hospital B will be paid an amount equal to the DRG base rate times the DRG weight.
 - GHI and Hospital B are negotiating the DRG base rate.
- (c) (2 points) Calculate the DRG base rate such that GHI is reimbursed a total of \$20,000 for the above claims. Show your work.

The response for this part is to be provided in the Excel spreadsheet.

Hospital B's final offer is a DRG base rate of \$9,000. GHI projects healthcare cost trend to be 5% per year over the next five years.

- (d) (1 point) List questions GHI should consider before finalizing the contract with Hospital B.

ANSWER:

- (e) (2 points) Propose a counter-offer to Hospital B. Justify your response.

ANSWER:

3.

(9 points) You are an actuary for PQR Insurance and are evaluating the introduction of benefit choice at XYZ Company.

- (a) (1 point) Describe how to measure selection and health status.

ANSWER:

- (b) (1 point) Describe the impact employee contributions have on selection.

ANSWER:

You are given:

- XYZ is fully-insured by PQR.
- XYZ offers three health plans to its employees:

Health Plan	Benefits	Monthly Premium Rate
A	Lean	\$500
B	Moderate	\$600
C	Rich	\$700

- PQR sets Year 1 premium rates based on the expected benefit value difference between plans.
- Year 1 premiums are not adjusted for anticipated selection.
- XYZ contributes \$400 per month to the Year 1 premium for each employee.
- Employees contribute the difference between the selected plan's premium rate and XYZ's contribution.
- XYZ's employee census:

	Number of Employees	Relative Health Status
Low Risk	75	50%
Average Risk	100	100%
High Risk	25	250%
Composite (Total)	200	100%

3. Continued

- Low risk employees choose Plan A.
- High risk employees choose Plan C.
- For Years 2-5, you are given:
 - PQR increases its rates by 10% each year.
 - XYZ maintains its per-employee contribution at \$400 per month.
 - Each year 5 employees move from Plan A to Plan B.
 - Each year 5 employees move from Plan B to Plan C.

(c) (2 points) Create a table showing the following Year 1 values for PQR for each plan and in aggregate:

- Total Monthly Premium
- Total Monthly Cost
- Cost as a Percent of Premium
- Antiselection Risk

Show your work.

The response for this part is to be provided in the Excel spreadsheet.

(d) (3 points) Calculate the:

- (i) Total cost and total premium for years 2 through 5.
- (ii) Aggregate antiselection risk.

Show your work.

The response for this part is to be provided in the Excel spreadsheet.

(e) (1 point) Describe how the antiselection spiral can be prevented.

ANSWER:

(f) (1 point) Design an employee contribution strategy that reduces the antiselection spiral. Justify your response.

ANSWER:

Question 4 pertains to the Case Study.

4.

(7 points)

- (a) (1 point) Describe the elements and risks involved in a typical pay-for-performance arrangement.

ANSWER:

- (b) (1 point) Describe key features when evaluating pay-for-performance programs, including the Medicare Hospital Quality Incentive Demonstration (HQID).

ANSWER:

- (c) (2 points) Assess how Green Shield Canada's Value Based Pharmacy Initiative addresses the following categories of risks:

- (i) Utilization

ANSWER:

- (ii) Technical

ANSWER:

- (iii) Insurance

ANSWER:

- (iv) Performance

ANSWER:

4. Continued

Quantum requests your assistance in designing a value-based pharmacy program, including the design of a quality rating system. You are given:

- Quantum Email 7

(d) (2 points) Critique the Star Rating Methodology proposed in Email 7.

ANSWER:

(e) (1 point) Revise Quantum's proposed Star Rating Methodology. Justify your response.

ANSWER:

5.

(10 points) You are a pricing actuary for Insurer QRS evaluating whether to offer Level Funding Products.

(a) (2 points) Describe:

(i) The advantages and disadvantages of self-funding.

ANSWER:

(ii) How level funding products benefit from the advantages of self-funding.

ANSWER:

(iii) How level funding products mitigate the disadvantages of self-funding.

ANSWER:

(b) (1 point) Describe the insurer's considerations when deciding to offer level funding products.

ANSWER:

You are given:

Area	Factor
Chicago	1.10
Phoenix	1.00
Los Angeles	0.95
New York	1.15

Age	Factor
0-20	1.00
21-30	0.90
31-45	1.10
45-64	1.75

5. Continued

Tobacco Status	Factor
Non-smoking	1.00
Smoker	1.50

- ASO Fees are \$50 PMPM
- ACA fees are \$3 PMPM
- Small Group base premium rate is \$400 PMPM
- Aggregate Stop Loss corridor is 120%

	Company A		Company B	
	Monthly Membership	Avg Cost PMPM	Monthly Membership	Avg Cost PMPM
Low Risk	650	\$50	250	\$125
Med Risk	300	\$250	625	\$450
High Risk	50	\$2,250	125	\$3,500

	Company A	Company B
Average Age	24.8	37.3
City	Phoenix	New York
Tobacco Usage	0%	55%

Coverage Cost Estimates (PMPM)		
	Company A	Company B
Specific Stop Loss	\$90	\$182
Aggregate Stop Loss	\$18	\$75
Paid Claims Fund	\$150	\$520
Reserve Fund	\$24	\$89

- (c) (2 points) Calculate the Relative Risk Factor for each company. Show your work.

<i>The response for this part is to be provided in the Excel spreadsheet.</i>

5. Continued

- (d) (3 points) Calculate for each company:
- (i) The ACA small group premium rate
 - (ii) The level funding premium rate

Show your work.

The response for this part is to be provided in the Excel spreadsheet.

- (e) (2 points) Calculate the refund owed to Company A under the level funding product if the actual claims experience below Specific Stop Loss is:
- (i) \$223 PMPM
 - (ii) \$177 PMPM
 - (iii) \$304 PMPM

Show your work. Explain your results.

The response for this part is to be provided in the Excel spreadsheet.

6.

(12 points)

- (a) (1 point) Describe advantages and disadvantages of episode-based physician profiling.

ANSWER:

- (b) (1 point) Compare the purposes of physician cost profiling and episode-based profiling.

ANSWER:

You are evaluating provider performance for HIJ Insurance. You are given allowed charges for 23 members over the course of one year. Each claim is for a distinct member.

	Physician A	Physician B	Physician C	All Other Physicians
Allowed Charge per Visit	\$350	\$340	\$355	\$286
	\$300	\$338	\$400	\$335
	\$305	\$280	\$385	\$372
	\$373	\$298	\$374	\$334
	\$261	\$322	\$348	\$382
		\$316		\$334
				\$366

- (c) (2 points) Calculate the physician cost profile for physicians A, B, and C. Show your work.

The response for this part is to be provided in the Excel spreadsheet.

HIJ is implementing a tiered network for primary care physicians. You are given:

- Members currently pay 10% coinsurance for annual physical exams
- Physician cost profiles from your response to part (c)

- (d) (2 points) Propose a 2-tiered cost sharing structure and assign each physician to a tier. State your assumptions. Justify your response.

ANSWER:

6. Continued

(e) (1 point) Explain how to develop a shift assumption:

(i) Before implementation of a Tiered Network Health Plan (TNHP).

ANSWER:

(ii) After implementation of a TNHP.

ANSWER:

(f) (1 point) Recommend a shift assumption. Justify your response.

ANSWER:

(g) (2 points) Calculate the impact of the TNHP on HIJ's costs using your proposed cost sharing structure, tier assignment, and shift assumptions. Show your work.

The response for this part is to be provided in the Excel spreadsheet.

Physician C agrees to a 10% reduction in allowed charges following implementation of the TNHP.

(h) (2 points)

(i) Recalculate the cost profiles and TNHP impact. Show your work.

(ii) Explain how this impacts your proposed tiering and shift assumptions.

The response for this part is to be provided in the Excel spreadsheet.

7.

(7 points)

- (a) (1 point) Explain how short term disability (STD) claims may trend due to utilization.

ANSWER:

You are an actuary for Insurer X and are calculating the 2021 STD renewal rates for MNO Company. Insurer X is not updating its STD manual base rate from the current value, but you will need to consider X's 2019 STD experience (provided below).

MNO is in the manufacturing industry and Northeast region. You are given:

- MNO pays 60% of the STD premium for employees who elect STD coverage
- MNO has nine eligible employees
- Seven employees participate in the STD plan:

# of Participating Employees	Age	Gender
3	23	Male
2	30	Male
2	55	Female

- Insurer X uses the following STD pricing factors:

Retention	% of Premium
Administration	10%
Claim Adjudication	3%
Commissions	10%
Premium Taxes	2%
Risks and Profit	5%

Age/Gender	Factor
Males under 25	0.50
Males 25-40	0.75
Males 40+	1.50
Females Under 25	0.50
Females 25-40	1.75
Females 40+	1.25

Group Size	Factor
5-9	1.10
10-19	1.05
20-49	1.00
50-74	0.95
75-100	0.90

Area	Factor
Northeast	1.15
Southeast	0.90
Midwest	0.90
West	1.10
Southwest	1.00

7. Continued

Industry	Factor
Hospitals, home health, doctors	1.5
Retail, sales, marketing	0.8
Finance, accounting	0.9
Construction and manufacturing	1.5
All other	1.0

Employer Contribution		Factor
Employer Subsidy	Employee Participation	
0-49.9%	0-49.9%	2.00
50-100%	0-49.9%	1.50
0-49.9%	50-100%	1.00
50-100%	50-100%	0.75

- Insurer X's 2019 STD experience:

Premiums and Expenses ('000s)

Premiums	\$10,000
Incurred Claims	\$75,000
Administration costs	\$1,100
Claim adjudication costs	\$280
Commissions	\$1,000
Premium taxes	\$200

Age/ Gender

Age/ Gender	Premium ('000s)	Claims ('000s)
Males under 25	\$1,500	\$1,125
Males 25-40	\$1,500	\$1,125
Males 40+	\$1,500	\$1,125
Females Under 25	\$2,000	\$1,500
Females 25-40	\$2,000	\$1,500
Females 40+	\$1,500	\$1,125

By Group Size

Age/ Gender	Premium ('000s)	Claims ('000s)
5-9	\$1,000	\$900
10-19	\$2,000	\$1,575
20-49	\$2,000	\$1,500
50-74	\$2,000	\$1,425
75-100	\$3,000	\$2,100

By Area

Area	Premium ('000s)	Claims ('000s)
Northeast	\$2,000	\$1,500
Southeast	\$2,000	\$1,600
Midwest	\$2,000	\$1,500
West	\$2,000	\$1,400
Southwest	\$2,000	\$1,500

By Industry

Industry	Premium ('000s)	Claims ('000s)
Hospitals, home health, doctors	\$500	\$550
Retail, sales, marketing	\$1,500	\$900
Finance, accounting	\$1,500	\$1,000
Construction and manufacturing	\$500	\$550
All other	\$6,000	\$4,500

7. Continued

By Contribution/ Participation

Employer Subsidy	Employee Participation	Premium ('000s)	Claims ('000s)
0-49.9%	0-49.9%	\$1,000	\$700
50-100%	0-49.9%	\$1,000	\$750
0-49.9%	50-100%	\$2,000	\$1,500
50-100%	50-100%	\$6,000	\$4,550

- (b) (4 points) Calculate the renewal rate change for MNO. Show your work.

The response for this part is to be provided in the Excel spreadsheet.

Two years have passed. MNO's actual claims for 2021 are:

Employee	Gender	Age	Expected Claims	Actual Claims
1	male	23	\$30,000	\$0
2	male	30	\$50,000	\$20,498
3	male	30	\$50,000	\$0
4	male	23	\$30,000	\$50,248
5	female	55	\$20,000	\$0
6	female	55	\$20,000	\$87,186
7	male	23	\$30,000	\$30,158

- (c) (2 points) Propose changes, if any, to the pricing factors to be applied to MNO's next policy renewal. Justify your response.

The response for this part is to be provided in the Excel spreadsheet.

****END OF EXAMINATION****