



## Group & Health Design and Pricing Exam

# Exam GHDP

**Date:** Tuesday, April 30, 2024

### INSTRUCTIONS TO CANDIDATES

#### General Instructions

1. This examination has 9 questions numbered 1 through 9 with a total of 70 points.

The points for each question are indicated at the beginning of the question.

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.

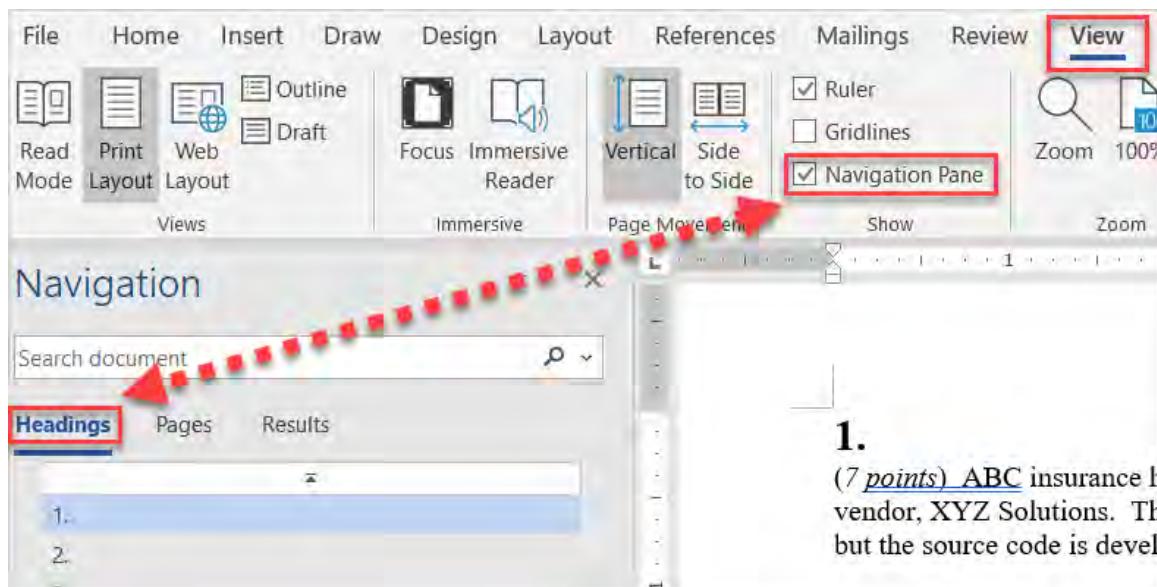
#### Written-Answer Instructions

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,  $\beta_1$  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 the five-minute upload period expires.

## **Navigation Instructions**

Open the Navigation Pane to jump to questions.

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



1.

**(7 points)** ABC insurance has a vendor, XYZ Solutions. The vendor has provided the source code to ABC. However, the source code is developed in a language that ABC does not support. ABC needs to hire a developer to rewrite the source code in a language that ABC supports. The developer will be paid \$100 per hour for the first 10 hours and \$150 per hour for any additional hours. The developer will also receive a 10% discount on all software licenses used in the development process.

*The Excel spreadsheet has additional data and information applicable to this question.*

**1.**

(6 points) You are an actuary pricing Medicare Part D.

In the Excel spreadsheet, you are provided with benefit design and allowed claims for Member A.

(a) (3 points) Calculate the member cost share and the amount applied to the out of pocket accumulator for Member A given the claims occur in:

- (i) 2023
- (ii) 2025

Show your work.

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

A less expensive generic drug is expected to become available in June 2025 for a patent-expired brand drug.

In the Excel spreadsheet, you are given projected drug claims for Member B.

(b) (2 points) Calculate the following for 2025 based on the projected claims for Member B:

- (i) Member cost share
- (ii) Plan liability
- (iii) Manufacturer liability
- (iv) Government reinsurance

Show your work.

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

## **1. Continued**

The company producing the generic equivalent drug launches the drug earlier than projected in 2025.

(c) (*1 point*) Evaluate the impact to:

- (i) Member cost share
- (ii) Manufacturer liability
- (iii) Government reinsurance

Justify your response.

ANSWER:

## **2.**

(6 points) You are an actuary working on critical illness products.

You are given the rate manual for a critical illness policy issued to a 40-year-old:

Annual Discount Factor	4%
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10-year Critical Illness Rating Manual		
Age	Claim Costs per 1,000	Lapse Rate
40	3.6869	30.0%
41	4.1144	20.0%
42	4.6027	10.0%
43	5.1402	10.0%
44	5.6784	10.0%
45	6.2865	10.0%
46	6.9788	10.0%
47	7.7689	10.0%
48	8.7133	10.0%
49	9.7366	10.0%
50	10.9319	10.0%

(a) (4 points)

- (i) Calculate the lifetime present value of claim costs. Show your work.
- (ii) Create a sensitivity test for the lapse rate.
- (iii) Explain the relationship between the lapse rate and the cost of providing coverage.
- (iv) Describe considerations when setting lapse rate assumptions for policies sold at the employees' worksite.

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

## 2. Continued

Your client has a group policy that will be renewed next year.  
You are given:

Group Credibility	35%
Actual to Expected Loss Ratio	130%

- (b) (*1 point*) Calculate the rate increase based on historical experience. State your assumptions. Show your work.

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

- (c) (*1 point*) Identify criteria to consider when selecting or developing a credibility procedure.

ANSWER:

*The Excel spreadsheet has additional data and information applicable to this question.*

**3.**

(6 points)

(a) (1 point) Describe:

- (i) Reasons a benefits package costs more when individuals are given choices.

ANSWER:

- (ii) Four factors that influence employee choice.

ANSWER:

You are a benefits consultant, working with two employer groups (OldCo and NewCo) and Insurer 2-Choices. Insurer 2-Choices offers a PPO and an HSA product.

In the Excel spreadsheet, you are given assumptions from Insurer 2-Choices' rate manual and information on OldCo's offerings.

(b) (3 points) Calculate the effective premium change for the HSA in 20X2 using the following scenarios:

- (i) 2-Choices insures both the PPO and the HSA
- (ii) 2-Choices insures the HSA while the PPO is insured by a competitor

Show your work.

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

In the Excel spreadsheet, you are given rating information for NewCo.

(c) (2 points) Calculate the amount of buy-down effect per employee that occurs in 20X2. Show your work.

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

*The Excel spreadsheet has additional data and information applicable to this question.*

**4.**

(9 points)

- (a) (1 point) Compare and contrast historical experience analysis for long-term care (LTC) and short-term medical products.

ANSWER:

- (b) (1 point) Describe common LTC plan design characteristics that policyholders can choose at time of policy purchase.

ANSWER:

You are an LTC actuary working for the publicly traded company GHI on their experience study team.

In the Excel spreadsheet, you are given pricing assumptions and benefit amounts.

- (c) (2 points) Calculate the total utilization rates by care setting. Show your work.

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

- (d) (2 points)

- (i) Develop an actual to expected analysis for the utilization rates for 20X1 and 20X2 combined. Show your work.

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

- (ii) Interpret the results of the actual to expected analysis.

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

#### **4. Continued**

(e) (2 points)

- (i) Develop an actual to expected analysis for the claims termination rates.  
Show your work.

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

- (ii) Interpret the results of the actual to expected analysis.

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

GHI leadership comments that “because paid claims were higher than anticipated, GHI should file a rate increase to ensure shareholders feel comfortable with our revenue.”

- (f) (1 point) Critique leadership’s comments based on the actual to expected analyses.

ANSWER:

*The Excel spreadsheet has additional data and information applicable to this question.*

**5.**

(11 points)

- (a) (2 points) Contrast Short-Term Disability (STD) and Long-Term Disability (LTD) insurance by completing the following table.

ANSWER:

	<b>STD</b>	<b>LTD</b>
Elimination periods		
Incidence rates		
Claim causes		
Claim payment timing		
Claim volatility		
Benefit periods		
Maximum benefit amounts		
Exclusions		

- (b) (1 point) Describe optional benefits commonly available on STD plans.

ANSWER:

You are a pricing actuary for an insurance company specializing in STD insurance.

In the Excel spreadsheet, you are given rating factors and 20X1 experience.

- (c) (4 points)

- (i) Calculate 20X1 profit. Show your work.
- (ii) Create an actual to expected study for each assumption by completing the table provided in the Excel file. Show your work.
- (iii) Interpret the results for each assumption.

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

## **5. Continued**

You are pricing a renewal for a high-profile Northeast construction company. The same employees participate in the plan as the prior year.

In the Excel spreadsheet, you are given rating factors, experience, and guidance from Lead Actuary on setting 20X2 rates.

- (d) *(3 points)* Calculate the renewal percentage increase. Show your work.

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

The sales representative is concerned with losing this high-profile, high-revenue client and believes it will be difficult to sell the renewal increase.

- (e) *(1 point)* Justify the rate increase with three supporting statements to the sales representative.

ANSWER:

*The Excel spreadsheet has additional data and information applicable to this question.*

**6.**

(8 points)

- (a) (1 point) Compare and contrast prospective experience rating and retrospective experience rating.

ANSWER:

- (b) (1 point) List and describe the three retrospective experience rating methods.

ANSWER:

In the Excel spreadsheet, you are given plan experience.

- (c) (3 points) Calculate the accumulated surplus or deficit as at June 30, 20X3 from the perspective of the:

(i) Client

(ii) Insurer

Show your work.

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

The client has a deficit recovery arrangement where:

- Surplus is accumulated over 1 year to offset future deficits.
- Deficits are recovered over 2 years.

- (d) (3 points) Calculate the PMPM premium rate for July 1, 20X4 to June 30, 20X5 under the deficit recovery arrangement. Show your work.

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

*The Excel spreadsheet has additional data and information applicable to this question.*

**7.**

(7 points)

- (a) (2 points) List and describe the steps in the group medical product development cycle.

ANSWER:

You are consulting for a private employer that wants to emulate the public prescription drug plan for plan year 2024 in Quebec.

You are given:

- All families include an employee, a spouse, and two children.
- Every adult would pay the maximum premium under the public plan.
- Pharmacy costs are evenly distributed for each month of the year.

In the Excel spreadsheet, you are given plan information and experience.

(b) (5 points)

- (i) Construct a private employer plan that meets the private plan requirements by proposing values for the annual deductible (X), annual out-of-pocket maximum (Y), and family monthly employee premium (Z). Show your work.
- (ii) Verify the plan design meets the private plan requirements.

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

*The Excel spreadsheet has additional data and information applicable to this question.*

**8.**

(9 points)

- (a) (1 point) List and describe group characteristics that impact Long Term Disability (LTD) insurance rates.

ANSWER:

- (b) (1 point) Describe ways group disability insurance products limit moral hazards.

ANSWER:

You are a disability actuary reviewing the experience of a large transport company that is about to renew its long-term disability (LTD) plan. The employees in the transport company are categorized into drivers and non-drivers. Leadership has proposed the following plan design for next year:

Covered employees	All employees
Definition of disability	Any occupation to age 65
Benefit amount	90% of monthly earnings
Elimination period	One month
Benefit period	To age 65
Benefits offsets	Not applicable
Tax Status	Non-Taxable
Optional benefits	Cost of Living Adjustment benefit: 6% per year
Payer of premiums	Employer

- (c) (4 points)

- (i) Critique the plan design.

ANSWER:

- (ii) Propose 4 plan design changes.

ANSWER:

## **8. Continued**

- (iii) Evaluate the premium impact for each plan design change.

ANSWER:

In the Excel spreadsheet, you are given company premium and assumptions.

- (d) (*1 point*) Calculate the change in the 20X2 company cost for:

(i) Drivers

(ii) Non-drivers

Show your work and state your assumptions.

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

- (e) (*1 point*) Explain why the changes in company cost may differ between drivers and non-drivers.

ANSWER:

- (f) (*1 point*) Critique the changes to employee contributions in 20X2.

ANSWER:

*The Excel spreadsheet has additional data and information applicable to this question.*

**9.**

(8 points)

- (a) (1 point) Describe how consumer-directed health plans (CDHP) lower costs compared to non-CDHP plans.

ANSWER:

You are a consulting actuary working with a large, self-insured employer group.

- (b) (2 points) Describe data quality considerations and disclosures needed when using claims experience provided by the employer group.

ANSWER:

You are given:

- In 20X1 and 20X2, the group only offered a copay-based plan design.
- In 4Q 20X2, the employer announced a change to full-replacement CDHP, effective in 20X3.
- No material changes to employee group member characteristics.

In the Excel spreadsheet, you are given claims experience.

- (c) (2 points)

- (i) Calculate the annual and quarterly year-over-year claims PMPM trends. Show your work.
- (ii) Explain the patterns in both annual and quarterly year-over-year claims PMPM trends.

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

## **9. Continued**

- (d) (*1 point*) Recommend adjustments when using the experience data. Justify your response.

ANSWER:

- (e) (*1 point*) Describe considerations for setting reserves when there is a material change in plan design.

ANSWER:

- (f) (*1 point*) Identify disclosures required when issuing an actuarial report to the group.

ANSWER:

**\*\*END OF EXAMINATION\*\***