# SOCIETY OF ACTUARIES
## Group and Health – Design & Pricing

# Exam DP-GH

## AFTERNOON SESSION

**Date:** Thursday, November 3, 2011
**Time:** 1:30 p.m. – 4:45 p.m.

### INSTRUCTIONS TO CANDIDATES

**General Instructions**

1. This afternoon session consists of 7 questions numbered 9 through 15 for a total of 60 points. The points for each question are indicated at the beginning of the question. There are no questions that pertain to the Case Study in the afternoon session.
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 since 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 DP-GH.
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.


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Exam DP-GH

****BEGINNING OF EXAMINATION****
**AFTERNOON SESSION**
***Beginning with Question 9***

**9.** (*6 points*) North Star HMO is considering contracting with a large multi-specialty physician group that has never participated in a prepaid arrangement.

(a) (*1 point*) Define the tasks that North Star should perform to evaluate this group for inclusion in its HMO network.

(b) (*2 points*) Identify four types of mechanisms North Star could use to compensate physicians, and compare and contrast the level of risk transferred to the physician group under each.

(c) (*2 points*) Outline each of the two major methods North Star could use to calculate service costs.

(d) (*1 point*) Suggest techniques that could help the physician group manage the overall risk of medical costs.

**10.** (*9 points*) The following is the historical experience of a block of Comprehensive Major Medical (CMM) business at Company XYZ.

| Service Category | Annual Utilization per 1,000 | Average Charge |
|---|---|---|
| **Hospital Inpatient (Admit)** | | |
| Medical/Surgical | 300.0 | $8,170 |
| Mental Health & Substance Use Disorder | 8.0 | $9,250 |
| Skilled Nursing Care | 10.5 | $10,925 |
| **Hospital Outpatient (Visit)** | | |
| Emergency Room | 300 | $750 |
| Surgery | 110 | $1,950 |
| Diagnostic Testing | 748 | $385 |
| **Physician (Visit)** | | |
| Primary Care Providers | 1,450 | $160 |
| Specialists | 2,050 | $285 |

Two benefit design options are being considered. Assume the designs are not different enough from the current design to significantly impact member behavior.

**Design A:** Deductible $1,500, 15% coinsurance with $2,500 out-of-pocket (OOP) max.

**Design B:** Hospital Services: Deductible $800, 15% coinsurance, $3,500 OOP Max; Physician Services: $40 copay.

Your marketing vice president, I.B. Simple, has suggested that net benefit values can easily be calculated using the benefit provisions directly applied to the average allowed costs given by the experience above.

(a) (*3 points*) Calculate the annual net benefit value under each cost sharing arrangement by applying the cost sharing provisions to the average allowed cost. Show your work.

(b) (*2 points*) Actuarial benefit factor (as defined by the Net / Allowed cost ratio) must be 0.7 to meet the "silver" benefit category under new health reform legislation. Suggest changes to either benefit design to meet this requirement using the method in (a). Show your work.

(c) (*2 points*) Assess whether calculating net benefit value by applying cost sharing provisions directly to average allowed costs will produce appropriate actuarial benefit factors. Justify your response.

## 10. Continued

(d) (*2 points*) Mr. Simple also has concerns with how XYZ will gain an edge over its competitors if plan designs are all actuarially equivalent regardless of how that is determined. Comment on factors that may cause XYZ to charge different premiums than competitors for otherwise actuarially equivalent plan designs.

**11.** (*12 points*) You are a dental pricing and product development actuary who has been asked to provide a response to a 2012 dental plan RFP for Bad Teeth, Inc. (BTI).

BTI wants to cut their dental plan costs while minimizing employee disruption. You have been given the following information:

**Current BTI Plan Design**

| | | Deductible | | | Coinsurance | | |
|---|---|---|---|---|---|---|---|
| Employee Group | Plan | Type 1 | Type 2 | Type 3 | Type 1 | Type 2 | Type 3 |
| Employee | Indemnity | $0 | N/C* | N/C* | 100% | N/C* | N/C* |
| Management | DPPO | $0 | $25 | $50 | 100% | 80% | 50% |

*N/C = not covered

- Annual allowed trend is 5%
- Experience is considered fully credible
- In absence of other information, the manual table can be used to supplement experience
- Percent of population utilizing Type 2 benefits is 15% and Type 3 benefits is 10%
- Assume DPPO values apply to both in and out of network services
- Manual rates have been adjusted for BTI's population

**BTI 2010 Membership and Unit Cost Summary**

| Employee Group | Number of Members | Type 1 | Type 2 | Type 3 |
|---|---|---|---|---|
| Employee | 800 | $120 | N/C | N/C |
| Management | 200 | $100 | $600 | $1,100 |

**2010 Dental Plan Manual Rates**

| | Type 1 | | Type 2 | | Type 3 | |
|---|---|---|---|---|---|---|
| Plan | Annual Utilization per 1,000 | Average Cost Per Service | Annual Utilization per 1,000 | Average Cost Per Service | Annual Utilization per 1,000 | Average Cost Per Service |
| Indemnity | 1,700 | $120 | 200 | $700 | 150 | $1,200 |
| DPPO | 1,700 | $100 | 185 | $625 | 140 | $1,150 |
| DHMO | 1,800 | $80 | 160 | $550 | 135 | $1,050 |

## 11. Continued

(a) (*2 points)* Compare the key differences of indemnity, PPO and HMO dental plans.

(b) (*1 point*) List the procedures usually included within each Type.

(c) (*5 points*) Calculate the 2010 PMPY net claims cost and expected 2012 PMPY net claims cost for each BTI dental plan under the current benefit designs. State your assumptions and show your work.

(d) (*2 points*) BTI wants to maintain its 2012 PMPY cost at 2010 levels for each employee group by adjusting only Type 2 and Type 3 deductibles while maintaining their current ratio.

(i) Calculate the revised deductibles that meet BTI's goal based on your results from (c). Show your work.

(ii) Comment on whether this alternative meets corporate goals for employees and management.

(e) (*2 points*) As an alternative to changing deductibles, BTI wants to explore the possibility of moving all employees into a DHMO and maintaining their current plan designs.

(i) Calculate the cost difference to BTI for the 2012 plan year if all employees and management are moved to a DHMO. Show your work.

(ii) Comment on whether this alternative meets corporate goals for employees and management.

**12.** (*9 points*) Company XYZ is a large Canadian employer that operates only in Ontario. Group benefits are currently provided on a traditional basis and senior management is focused on attracting and retaining key talent without increasing cost. You have been asked to review the current arrangement and provide guidance on flexible design alternatives.

Below is a high level summary of the current traditional plan design:

| Benefit | Description |
|---|---|
| Basic Employee Life Insurance | 2 times annual salary up to a maximum of $500,000 |
| LTD | 60% monthly salary up to a maximum of $12,500 |
| Extended Health | Annual deductible: $50 single/ $100 family<br>Coinsurance: 80% reimbursement<br>Prescription drug card<br>Paramedical: $300 annual maximum per practitioner |
| Dental | Annual deductible: $50 single/$100 family<br>Basic Coinsurance: 90% reimbursement<br>Major Coinsurance: 60% reimbursement<br>Orthodontic Coinsurance: 50% reimbursement<br>Basic and Major Combined Annual Maximum: $1,500<br>Orthodontics Lifetime Maximum: $3,000 |

The premium cost of each benefit is shared equally between the employer and employees.

(a) (*2 points*) Describe flexible benefit design structures and the advantages and disadvantages of each for an employer.

(b) (*2 points*) Describe ways to structure the pricing and allocate credits under a flexible benefit plan.

(c) (*1 point*) Outline the tax implications for the employees and employer for the current plan design.

(d) (*1 point*) List additional benefits that could be added within the proposed flexible benefit program.

(e) (*3 points*) Draft the main points for a memo your client can send to senior management to support a move to flexible benefits, as well as a recommendation regarding the flexible benefit plan and credit structure. Justify your recommendation.

**13.** (*6 points*) The following have been major topics of proposed reform in the U.S. health care debate.

- Minimum Loss Ratios
- Individual Mandate
- Actuarial Equivalence
- Health Insurance Exchanges
- Employer-Sponsored Retiree Benefits

(a) (*2 points*) Summarize the issues in the pre-reform health care landscape that each of these topics is intended to address.

(b) (*4 points*) Analyze the risks and opportunities presented by the individual mandate and health insurance exchanges from the perspective of a multi-line health insurance company.

**14.** (*12 points*) YYZ Corp, a large employer, is considering funding arrangements for the next renewal cycle. Currently YYZ is fully insured and prospectively rated. YYZ has had historically low claims. You are presenting the 2012 renewal to the group and will need to explain the calculations as well as offering different options for the group to manage costs. The renewal is effective for the period from 1/1/2012 through 12/31/2012.

The YYZ Corp had the following experience period data:

| Experience Period | 1/1/2010 through 12/31/2010 |
|---|---|
| Average Monthly Members | 450 |
| Claims Reserve (IBNR) 12/31/2009 | $250,000 |
| Claims Reserve (IBNR) 12/31/2010 | $269,500 |
| Total Paid Claims | $1,330,500 |
| Pooling Threshold | $100,000 per member |

2010 Large Claimant Information:

| Member | Total Claims Paid |
|---|---|
| A | $175,000 |
| B | $113,000 |
| C | $190,000 |
| D | $225,000 |
| E | $129,000 |

2010 Pool Information and Administration Charges:

| | |
|---|---|
| 2010 Expected Incurred Claims After Pooling | $1,000,000 |
| Pooling Charges for $100,000 Pooling Threshold | $31.50 PMPM |
| Claims Trend | 7.8% |
| Administration Charge | $28.25 PMPM |
| Expected Monthly Member Count | 432 |
| Target Profit Charge | 2% of Premium |
| Premium Tax | 2% of Premium |
| Credibility Formula (C) | C = Min(Member Months/6000, 1) |

(a) (*1 point*) Outline the characteristics, advantages and disadvantages of the funding arrangements available to YYZ.

(b) (*1 point*) Explain the pros and cons of experience rating.

## 14. Continued

(c) (*3 points*) Explain what each component of the renewal rate represents and why it is included in the calculation.

(d) (*2 points*) Calculate the proposed renewal rate. Show your work.

(e) (*3 points*) YYZ is considering a retrospective premium refunding arrangement. Calculate what the retrospective refund as of 12/31/2010 would have been, using the experience period information and the following additional information:

| | |
|---|---|
| Rate Stabilization Reserve Balance | $127,500 (as of 12/31/2010) |
| Pooling Charges for $100,000 Pooling Threshold (Experience Period) | $29.00 PMPM |
| Premium (For CY 2010) | $1,500,000 |
| Investment Income | -$27,167 |
| Expenses Charge | $25.75 PMPM |
| Risk Charge | 1% of Premium |
| Profit Charge | 2% of Premium |
| Rate Stabilization Reserve Addition | $0 |

(f) (*2 points*) Assume that in 2011, YYZ was representative of the insurer's large group block in terms of size, expected claims cost and earned monthly premium. Under PPACA, estimate the expected amount of rebate owed to the block, assuming a block size of 1,500,000 member months. Show your work.

**15.** (*6 points*) HST Technics is a large call center with nearly 500 employees who provide customer service support in a stressful environment. The company engaged a disease management (DM) vendor after worksite testing determined a significant portion of the population has diabetes, hypertension, high cholesterol and obesity.

The HR director provides you with the disease management vendor's report and asks for your input:

| | Baseline Membership | Baseline Costs/Member | Intervention Membership | Intervention Costs/Member |
|---|---|---|---|---|
| DM members | 215 | $12,000.00 | 181 | $12,400.00 |
| Non DM members | 1,141 | $500.00 | 1,214 | $550.00 |
| Total Members | 1,342 | $2,347.62 | 1,395 | $2,087.53 |

| Risk Score Report | Baseline Year | Intervention Year |
|---|---|---|
| DM members | 3.00 | 2.75 |
| Non DM members | 1.10 | 1.11 |
| Total Members | 1.42 | 1.32 |

The DM vendor calculates a savings of $= \$2,087.53 - \$2,347.62 = \$260.09$ per member savings per year. $\$260.09 \times 1,395$ members = savings of $\$362,823.62$. You have concerns with the DM vendor's savings estimate.

The HR department believes that a wellness program is needed as well.

(a) (*1 point*) Compare and contrast the three main types of wellness programs.

(b) (*1 point*) Identify concerns with implementing a wellness program for this situation.

(c) (*1 point*) Recommend a type of wellness program. Justify your recommendation.

(d) (*1 point*) Evaluate the DM vendor's method for calculating cost savings.

(e) (*2 points*) Calculate a better estimate of the disease management program savings. Show your work.

****END OF EXAMINATION****
**AFTERNOON SESSION**

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