****BEGINNING OF EXAMINATION****
**HEALTH, GROUP LIFE & MANAGED CARE**
**MORNING SESSION**

**1.** *(4 points)* Your CEO is departing for a meeting to discuss the marketing strategy for a new managed care product. He has asked you to brief him on the following topics:

(a) With regard to distribution models
  (i) Describe traditional and alternative distribution models.
  (ii) Describe considerations relative to the major constituent groups that influence the distribution process.

(b) Describe market segments commonly used for managed care products.

| **Questions 2 – 8 pertain to the Case Study** |
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**2.** *(9 points)* You have been asked to analyze the claim experience for Wonderful Life in Tables MM-6a and MM-6b of the case study.

(a) Describe the impact on trend of company-specific care management initiatives.

(b) Calculate the year-over-year quarterly rolling trend for 3Q02 and 4Q02.

(c) Recommend baseline trends for Hospital, Non-Hospital and Total Medical Costs. Assume the last half of 2002 is predictive of future trends. Justify your answer.

(d) Based on the following assumptions:

- On January 1, 2003, 50% of the hospitals will accept 10% discount off the 2003 Hospital contracted rate.
- These hospitals deliver 1/3 of your facility care.
- The remaining hospital contract costs will increase as expected.
- Utilization does not change.

Calculate a revised estimate of Hospital and Total Medical Trend. Show your work.

(e) Marketing has just sold a large group with 5,000 employees (12,000 members). All of the group members will only use hospitals that accept the 10% discount.

Calculate a revised estimate of Total Medical Trend. Show your work.

**Questions 2 – 8 pertain to the Case Study**

**3.** *(13 points)* You are a consultant for Bailey Industries. Bailey has been struggling to balance increased medical costs against employee demand for more choice in coverage. Bailey is considering the adoption of a new medical plan with patient-directed benefits. In addition to Table B-1, you are given the following claims probability distribution and proposed benefit options:

| Claims Range | Percentage of Employees with claims cost in range | Average claims cost per employee in range |
|---|---|---|
| $0 | 15% | 0 |
| $1 - $1,000 | 40% | $400 |
| $1,000 - $2,000 | 15% | $1,500 |
| $2,000 - $5,000 | 15% | $3,500 |
| $5,000+ | 15% | $25,000 |

| | Option A | Option B |
|---|---|---|
| Deductible | $1,000 | $2,000 |
| Coinsurance | 10% | 20% |
| Annual Employee Premium | $0 | $0 |
| Employer funds placed in Employees PHA | $500 | $1,250 |

(a) *(1 point)* Describe problematic aspects of the current employer-sponsored system for employers and employees.

(b) *(3 points)* Describe key implementation considerations for an employer adopting a PDHB approach and how they would apply to Bailey Industries.

(c) *(3 points)* Describe models used to predict selection costs for the medical options. Identify and explain why certain models are not appropriate for evaluating costs for Bailey Industries.

(d) *(6 points)* Assume a group of all single employees who, absent choice, would be equally distributed between the two options. Assume PHA (Personal Health Account) funds are expenses to Bailey Industries.

(i) Construct a choice model for Options A&B and calculate maximum adverse selection cost.

(ii) Explain why adverse selection will be less than the amount calculated by a choice model.

(iii) Describe methods to manage adverse selection in PDHB models.

**Questions 2 – 8 pertain to the Case Study**

**4.** *(5 points)* You are the chief actuary for Wonderful Life. You must determine whether Wonderful Life needs to hold any premium deficiency reserves (PDR).

(a) *(1 point)* Outline assumptions to be considered when calculating a PDR.

(b) *(1 point)* Recommend the groupings Wonderful Life should use to assess the need for a PDR. Support your recommendation.

(c) *(3 points)* In addition to Tables MM-1, MM-7, and MM-2a you are given the following information:

- The overall 2003 rate increase is limited to 12% due to small employer rating requirements.
- This rate increase limit only applies to 2003.
- Member termination from 2002 to 2003 will be at the same rate as has been experienced in the past.
- Expenses are calculated assuming an average of 1.75 members per employee.
- Ignore interest and income taxes.

Determine if a PDR should be held as of 12/31/2002 for the closed block of business in Wonderful Life's Small Group Department.

**Questions 2 – 8 pertain to the Case Study**

**5.** *(7 points)* Your manager at Wonderful Life Insurance Company has asked you to calculate renewal rates for Group 6 for a March 1, 2003, renewal date using a combination of multi-year loss ratio and catastrophic pooling methods.

In addition to information from Tables MM-2a and MM-2b:

- Assume case characteristics for Option 1 and Option 2 are the same for both years as shown in Table MM-3b.
- The gross premium for Group 6 for July 1, 2000 to June 30, 2001 was $5,800,000.
- Weights for averaging are 75% for current rating period and 25% for prior rating period.

Calculate the annual gross premium for an employee with dependents selecting Option 1. Show your work.

**6.** *(3 points)* You have been asked to develop materials for a meeting to discuss Wonderful Life's 5-year plan.

(a) Describe possible strategies a group insurance company could use to gain a competitive advantage.

(b) Describe how Wonderful Life Insurance Company has demonstrated these strategies in their four primary business divisions. Give an example of such a strategy for each division.

**Questions 2 – 8 pertain to the Case Study**

**7.** *(8 points)* In addition to the information provided in Tables C-1, C-2, MM-1, MM-4a to MM-6b, you have been given the following:

- Investment income and taxes are based on 2002 corporate levels
- Corporate after-tax Return on Equity (ROE) objective for 2003 = 15%
- Cost of Capital = 10%
- Risk-based surplus for Major Medical division is 18% of premium.
- Recast of Major Medical Division's IBNR as of 12/31/99 is $50,000 more than originally booked.

Total of MM-6a & 6b

| Year | Incurred and Paid ($1,000s) | Incurred Estimate ($1,000s) | IBNR Estimate ($1,000s) |
|---|---|---|---|
| 2000 | $1,004,700 | $1,004,700 | $0 |
| 2001 | $1,125,200 | $1,126,224 | $1,024 |
| 2002 | $1,121,300 | $1,378,977 | $257,677 |

(a) *(1 point)* Describe the importance of using recast data in financial management.

(b) *(3 points)* Convert the corporate ROE objective into the equivalent:
   (ii) corporate underwriting gain objective
   (iii) corporate loss ratio objective

(c) *(4 points)* Using recast claims data, calculate the Economic Value Added as a percentage of capital invested for the Major Medical Division for 2000, 2001 and 2002. Show your work.

**Questions 2 – 8 pertain to the Case Study**

**8.** *(6 points)* You are evaluating Wonderful Life's reserves and believe the claim lag pattern may have recently changed.

(a) Calculate the age-to-age development factors based on 9/2001 to 12/2002 emerging experience using claims paid in the most recent two months on Table MM-4b.

(b) Estimate incurred claims for December 2002 assuming all claims are complete after 15 months.

(c) Describe considerations involved in using age-to-age development factors to estimate incurred claims.

**9.** *(5 points)* You are the pricing actuary for the division of LTDC Life Insurance selling group long term disability and group long term care products. Given the recent fluctuations in the experience, you are considering implementing a reinsurance agreement but must convince your Vice-President that it is needed.

(a) Explain the different approaches LTDC Life can use to reinsure its Group LTD and LTC products.

(b) Explain risk characteristics of each product line that make the use of reinsurance attractive.

****END OF EXAMINATION***
**MORNING SESSION**

****BEGINNING OF EXAMINATION****
**MANAGED CARE SEGMENT**
**AFTERNOON SESSION**
***Beginning With Question 10***

**10.** *(3 points)* You have been asked to summarize the report of the SOA Medical Effectiveness Task Force.

(a) Explain the importance of measuring medical effectiveness.

(b) Explain the main health plan performance evaluation categories.

**11.** *(4 points)* Your company offers an insurance product with the following equally likely events.

| Event | Frequency of Claim Given Event Occurs | Severity of Claim Given Event Occurs | |
|---|---|---|---|
| | | Probability | Claim Size |
| 1 | 25% | 75%<br>25% | 1,000<br>500 |
| 2 | 50% | 50%<br>50% | 1,000<br>500 |
| 3 | 75% | 10%<br>90% | 1,000<br>500 |

You are also given the following additional information:

- 7 years of claims history for one individual

| Year | Claims |
|---|---|
| 1 | - |
| 2 | 500 |
| 3 | - |
| 4 | - |
| 5 | 1,000 |
| 6 | 1,000 |
| 7 | - |

- Expected Value of the Process Variance = 133,581
- Target Loss Ratio = 80%
- Ignore the impact of trend

(a) Calculate the expected gross premium for this product. Show your work.

(b) Calculate the credibility. Show your work.

(c) Calculate the credibility weighted total premium for this individual. Show your work.

**12.** *(4 points)* ABC Company is considering acquiring ITSA, a managed care organization that services a number of major cities. You are the head of the claims department in the Major Medical division and you've been asked to evaluate claims operations at ITSA, including systems used to process the claims.

(a) Describe measures of claims quality.

(b) Outline basic steps you would expect to find in the ITSA claims adjudication process.

(c) Describe specific internal data sources you should include as part of your claims review.

(d) Describe issues that should be considered in performing an audit.

**13.** *(4 points)* You have been asked by your client at BEST HMO to create a presentation that will enable her to convince management to establish new methods for physician compensation.

(a) Describe traditional and new, alternative forms of capitation and their suitability for specific types of physicians.

(b) Describe traditional and new, alternative forms of incentive plans.

**14.** *(5 points)* You are a consultant hired by TeethFerry.com, a company hoping to use the Internet to market dental plans. They have created a marketing communication to be sent to companies that do not currently have a benefits program.

From: TeethFerry.com
Subject: Quality Dental Coverage with 3 Months at No Charge

Affordable Dental Coverage

- save up to 60% on all your dental needs
- choose from 15 of the finest nationwide and regional plans
- pay premiums, submit claims, get the latest information, all on your desktop!

(a) List the general types of delivery systems for dental plans and their major features.

(b) Outline plan provisions and claim practices that dental insurers can use to limit cost and anti-selection.

(c) Describe challenges that e-commerce companies must overcome to be successful.

**Questions 15 - 18 pertain to the case study**

**15.** *(4 points)* The Bedford Group is exploring alternatives to acute inpatient care. A study by Bedford's Medical Director indicates the MCO might benefit from a program to encourage patients with conditions requiring less intensive treatment to be moved from acute care facilities to a Skilled Nursing Facility (SNF). The initiative would transfer acute care patients to the SNF at Hospital ID1 and is expected to result in the following changes:

| | Reduction in Medical Acute Days | Reduction in Surgical Acute Days |
|---|---|---|
| Hosp ID1 | 1.0% | 0.5% |
| Hosp ID2 | 2.0% | 2.0% |
| Hosp ID3 | 1.5% | 1.0% |

(a) Assuming the above reductions are realized, and based on Table MC-2, calculate the expected change in medical, surgical and SNF days/1000 and the change in medical/surgical length of stay in 2002 for the MCO. Show your work.

(b) Describe behavioral health channeling mechanisms available to direct individuals to the appropriate type of care.

**Questions 15 - 18 pertain to the case study**

**16.** *(4 points)* You are a consulting actuary for Hospital ID1. The Bedford Group is proposing to capitate Hospital ID1 for inpatient hospital services incurred by its members. You have been asked by Hospital ID1 to develop capitation targets for negotiations with the Bedford Group.

In addition to information provided in Tables MC-2 and MC-7, you have made the following assumptions:

- administrative expenses: 8% of capitation
- risk charges: 6% of capitation
- the 2002 hospital experience is credible

(a) Using an actuarial cost model based on your current provider contract with Bedford Group, calculate the base pmpm cost. Show your work.

(b) List key assumptions that should be considered when determining the utilization, average cost and pmpm targets in an actuarial cost model.

(c) Describe additional considerations that Hospital ID1 should consider when evaluating a capitation proposal.

**Questions 15 - 18 pertain to the Case Study**

**17.** *(12 points)* You are an actuary for the Bedford Group. In a meeting with the VP of Provider Contracting, you are told that a large physician specialty group that provides 15% of all specialty services has left IPA1 and joined IPA2.

Assume that:

- Physician risk share arrangements for 2002 and 2003 do not change.
- For PCP's in IPA1, the 2002 actual claim cost equals the target claim cost.

Using Tables MC-5, MC-7, and MC-8, and based on 2002 experience:

(a) Adjust the 2003 risk share arrangements for IPA1 and IPA2 to reflect the provider change. Show your work.

(b) Calculate the expected 2003 payments to IPA1 and IPA2 based on the specialty group shift to IPA2, including any risk share adjustments and ignoring trend. Show your work.

(c) Excluding any risk share arrangements, calculate the new percent of Medicare reimbursement to IPA2 to maintain pmpm costs for the Bedford Group at the 2002 level. Show your work.

(d) In case IPA2 does not accept a change to their Medicare reimbursement level, you would consider offering a specialty capitation arrangement. Discuss the advantages and disadvantages of a specialty capitation arrangement.

**Questions 15 - 18 pertain to the case study**

**18.** *(6 points)* You are the pricing actuary for the Bedford Group and have been asked by the Marketing Director to develop new pharmacy premiums. She is interested in having a more competitively priced product. Your CFO has indicated that your profit goal is 2.5% of premium.

Assume the HMO and POS plans have identical plan formularies with the following copays:

- Generic $10
- Formulary Brand $20
- Non-Formulary $40

Using 2003 budgeted experience from Table MC-4, information provided on Table MC-7, and assuming AWP = $80, then:

(a) Calculate the premium if Bedford:
   (i) retains all rebates.
   (ii) uses all rebates to reduce premiums.

(b) Describe the purposes of rebates, issues surrounding rebates, and actions which can be taken to increase rebates.

**19.** *(5 points)* You are a consulting actuary for an HMO that wishes to control utilization, yet maintain high quality of care.

(a) Describe traditional approaches to quality assessment.

(b) Review regulatory issues relating to quality assurance and their impact on HMOs.

(c) Describe managed care methods used to control medical utilization and the types of services impacted by each method.

(d) Review state regulations that may limit an HMOs ability to manage utilization and costs.

**20.** *(4 points)* You serve on a professional task force advising a State Senator on health insurance reform issues. New health reform legislation is being proposed which is intended to meet the following objectives:

- Promote a reduction in the working uninsured population
- Promote job mobility
- Facilitate the ability of individuals and small employers to compare insurance policies offered by different health carriers
- Reduce variation in, and volatility of premium rates charged to different groups

(a) Describe key recommendations regarding the above objectives to be included in reform legislation.

(b) The legislature is also reviewing risk adjustment mechanisms for Medicaid HMO plans. Compare and contrast methods of risk adjustment and recommend a method to be included in the legislation. Justify your recommendation.

**21.** *(5 points)* You are a consulting actuary retained by Capitalized Health Plan, a licensed HMO in a state that has passed the NAIC Risk-Based Capital For Health Organizations Model Act (RBC Model). The CFO is unfamiliar with risk-based capital and has asked you to make a presentation to educate him and his staff. In your research, you have extracted the following information from Capitalized HP's 2002 Statutory Annual Statement:

| | |
|---|---|
| Assets (Non-Affiliated) | |
| – U.S. Government Bonds | \$ 4.6 million |
| – Class 1 Bonds | \$ 9.8 million |
| – Class 1 Preferred Stock | \$ 2.2 million |
| – Common Stock | \$ 2.0 million |
| Underwriting Revenue/Earned Premium | |
| – Comprehensive Medical & Hospital | \$45.0 million |
| – Dental | \$16.3 million |
| – ASO Fees | \$ 5.0 million |
| Claim Payments under: | |
| – capitation (paid directly to providers) | \$11.0 million |
| – professional fee schedule | \$22.7 million |
| – hospital case rates | \$10.2 million |
| – discounted charges | \$ 8.2 million |
| Underwritten business administrative expenses (excludes premium taxes & commissions) | \$ 2.1 million |

(a) Describe regulatory implications of RBC outcomes.

(b) Describe other uses of RBC measurements.

(c) Review the variables and formula for health RBC after covariance as used in the RBC Model.

(d) Recommend ways to reduce the amount of RBC that Capitalized HP must hold.

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