

# Index

<b>Medical Benefits in Canada</b>	Bluhm Group Chapter 7	D - 9
<b>Dental Benefits in the United States</b>	Bluhm Group Chapter 8	A - 46
<b>Miscellaneous Benefits</b>	Bluhm Group Chapter 11	A - 54
<b>Government Old Age, Survivors and Disability Plans in the US</b>	Bluhm Group Chapter 12	D - 18
<b>Government Health Care Plans In the US</b>	Bluhm Group Chapter 13	D - 21
<b>Small Group Rate Fillings and Rate Certifications</b>	Bluhm Group Chapter 21	E - 21
<b>Underwriting Large Groups</b>	Bluhm Chapter 24	I - 4
<b>Underwriting Small Groups</b>	Bluhm Group Chapter 25	I - 15
<b>Estimating Claims Costs for Life Benefits</b>	Bluhm Group Chapter 29	H - 4
<b>Estimating Medical Claim Costs</b>	Bluhm Group Chapter 30	H - 11
<b>Estimating Claim Costs for Disability Benefits</b>	Bluhm Group Chapter 31	H - 98
<b>Estimating Dental Claim Costs</b>	Bluhm, Group Chapter 32	H - 137
<b>Calculating Gross Premia</b>	Bluhm Group Chapter 34	H - 144
<b>Experience Rating and Funding Methods</b>	Bluhm Group Chapter 35	I - 50
<b>Medical Claim Cost Trend Analysis</b>	Bluhm Group Chapter 36	H - 17
<b>Applied Statistics</b>	Bluhm Group Chapter 38	H - 150
<b>Data Sources and Structures</b>	Bluhm Group Chapter 39	H - 155
<b>Underwriting Gain and Loss Cycles</b>	Bluhm Chapter 42	I - 70
<b>Product Development</b>	Bluhm Group Chapter 44	I - 59
<b>Management of Provider Networks</b>	Bluhm Group Chapter 46	H - 71
<b>Introduction</b>	Bluhm Individual Chapter 1	E - 4
<b>The Products</b>	Bluhm Individual Chapter 2	B - 3
<b>Policy Forms</b>	Bluhm Individual Chapter 3	E - 7
<b>Managing Anti-Selection</b>	Bluhm Individual Chapter 4	I - 27

<b>Setting Premium Rates</b>	Bluhm Individual Chapter 5	H - 84
<b>Forecasting and Modelling</b>	Bluhm Individual Chapter 8	H - 93
<b>Regulation</b>	Bluhm Individual Chapter 9	E - 13
<b>Managing the Business</b>	Bluhm Individual Chapter 11	I - 39
<b>Understanding Patient Risk and Its Impact on Chronic and Non-chronic Member Trends</b>	Duncan Chapter 9	H - 56
<b>A Comparative Analysis of Chronic and Non-Chronic Insured Commercial Member Cost Trends</b>	Duncan Chapter 11	H - 59
<b>Introduction to Wellness and Integrated Programmes</b>	Duncan Chapter 13	A - 81
<b>The Relationship Between Health Risk Factors and Health Care Claims Cost in Programme Design and Evaluation</b>	Duncan Chapter 15	H - 63
<b>Introduction and History</b>	Herzog Chapter 1	I - 83
<b>Mathematical Preliminaries</b>	Herzog Chapter 2	I - 86
<b>Clinical Trials - An Application of Bayesian Inference about Binomial Probabilities</b>	GH-D126-11 Herzog Chapter 11	G - 17
<b>Case Study Application of Credibility Theory to Group Health Insurance</b>	Herzog Chapter 12	I - 88
<b>Elements of Flexible Benefits</b>	McKay Chapter 2	C - 26
<b>Starting a Flexible Programme</b>	McKay Chapter 3	C - 30
<b>Plan Structure and Eligibility</b>	McKay Chapter 4	D - 3
<b>Provincial Health Insurance Plans</b>	McKay Chapter 5	D - 7
<b>Death and Disability</b>	McKay Chapter 6	A - 40
<b>Flexible Expense Accounts</b>	McKay Chapter 7	C - 36
<b>Taxation of Flexible Benefits</b>	McKay Chapter 12	F - 14
<b>Discrimination Issues</b>	McKay Chapter 13	F - 20
<b>Pricing</b>	McKay Chapter 14	I - 73
<b>Adverse Selection</b>	McKay Chapter 16	I - 80
<b>Case Studies</b>	McKay Chapter 23	C - 42

<b>The Environment of Employee Benefit Plans</b>	Rosenbloom Chapter 1	C - 5
<b>Functional Approach to Designing and Evaluating Employee Benefits</b>	Rosenbloom Chapter 2	C - 7
<b>Risk Concepts and Employee Benefit Planning</b>	Rosenbloom Chapter 3	C - 12
<b>Understanding Managed Care Health Plans: The Managed Care Spectrum</b>	Rosenbloom Chapter 6	A - 3
<b>Understanding Managed Care Health Plans</b>	Rosenbloom Chapter 7	C - 15
<b>Alternative Prescription Drug Plans and Their Impact on Employers</b>	Rosenbloom Chapter 11	A - 13
<b>Understanding Managed Behavioural Health Care Benefits</b>	Rosenbloom Chapter 12	A - 23
<b>Social Security and Medicare</b>	Rosenbloom Chapter 22	D - 24
<b>Cafeteria Plan Design and Administration</b>	Rosenbloom Chapter 37	F - 3
<b>Management of Financial Risk for Prepayment</b>	Sutton & Sorbo Chapter I	H - 28
<b>Organizational Considerations in Actuarial Risk Management</b>	Sutton and Sorbo Chapter 2	H - 33
<b>Development of Cost Assumptions for Health Care Services</b>	Sutton and Sorbo Chapter 3	H - 34
<b>Medical Group Capitation</b>	Sutton and Sorbo Chapter 4	H - 41
<b>Fundamentals of Development of Health Maintenance Organization Capitation Rates and Premium Rates</b>	Sutton and Sorbo Chapter 5	H - 42
<b>Community Rating by Class and Experience Rating</b>	Sutton and Sorbo Chapter 6	H - 46
<b>Multiple Capitation Contracts and Specialty Capitation Arrangements</b>	Sutton and Sorbo Chapter 11	H - 49
<b>Introduction</b>	Yamamoto Chapter 1	C - 3
<b>Erosion of Retiree Health Benefits</b>	Yamamoto Chapter 2	C - 47
<b>Medicare</b>	Yamamoto Chapter 3	D - 29
<b>Retiree Benefit Design</b>	Yamamoto Chapter 4	C - 48
<b>Funding</b>	Yamamoto Chapter 5	C - 59
<b>Specialty Accident and Health Products</b>	GH-D100-07	A - 58

<b>Group Disability Insurance</b>	GH-D101-07	A - 35, E - 27, H - 105, I - 48
<b>Group Life Insurance</b>	GH-D102-07	A - 30, F - 23, H - 119, I - 46
<b>Pricing Long Term Care</b>	GH-D103-07	A - 72, H - 121
<b>Pricing Medicare Supplement Benefits</b>	GH-D104-07	B - 22, E - 28, H - 141, I - 49
<b>Direct Marketing</b>	GH-D105-00	B - 13
<b>Multi-Employer Plans</b>	GH-D106-07	A - 76
<b>Actuarial Aspects of Taft-Hartley Welfare Plans</b>	GH-D107-07	H - 160
<b>Medical Underwriting : Approaches and Regulatory Restrictions</b>	GH-D109-07	I - 43
<b>An Introduction to Predictive Modelling for Disease Management Risk Stratification</b>	GH-D110-07	G - 3
<b>Consumer</b>	GH-D111-07	G - 6
<b>Monitoring and Projecting Pricing Trends in a Managed Care Environment</b>	GH-D112-07	H - 51
<b>Group Long Term Disability</b>	GH-D113-07	H - 108
<b>Variation by Duration in Small Group Medical Insurance</b>	GH-D117-07	I - 24
<b>National Health Care Reform: Strategic Considerations for Large Employers</b>	GH-D118-11	E - 94
<b>What Kind of Risk Adjustment Systems Are Necessary for Health Insurance Exchanges?</b>	GH-D119-11	E - 89
<b>Operation of a Health Exchange within the PPACA</b>	GH-D120-11	E - 74
<b>Health Insurers Need to Quickly Assess Operational Costs for Medical Services under Health Care Reform</b>	GH-D121-11	E - 63
<b>Should Your State Establish a Health Insurance Exchange?</b>	GH-D122-11	E - 71
<b>Health Insurance Exchanges: Implementation and Data Considerations for States and Existing Models for Comparison</b>	GH-D123-11	E - 77
<b>What Do We Really Know about Consumer Driven Health Plans?</b>	GH-D124-11	E - 101
<b>Health Care Reform Law</b>	GH-D125-11	E - 30
<b>Credibility Procedures Applicable to Accident and Health, Group Term Life , and Property/Casualty Coverages</b>	Actuarial Standard of Practice No. 25	I - 91

<b>Predictive Modelling Applications</b>	RSA 31 #2	G - 9
<b>Predictive Modelling: Considerations for Care Management Applications</b>	Health Section News, April, 2004	G - 13
<b>Assessing Predictive Modelling Tools for Pricing and Underwriting</b>	Health Watch January, 2006	G - 15
<b>Update on Massachusetts Health Care Financing Reform</b>	Health Watch 01/2008	D - 38
<b>Timing's Everything: The Impact of Benefit Rush</b>	Health Watch 05/2008	H - 159
<b>Design and Pricing of Tiered Network Health Plans</b>	Health Watch May, 2009	H - 147
<b>Effective Contracting with Pharmacy Benefit Managers</b>	Health Watch February 2010	A - 19
<b>Modelling, Anti-selection and Optimal Pricing of Individual Medical and Small Group Insurance</b>	Health Watch February 2010	I - 34
<b>Generic Dispensing Rates: Silver Bullet No More?</b>	Health Watch May, 2010	I - 68
<b>New Member Impact on Medicaid Managed Care Costs</b>	Health Watch September, 2010	H - 15
<b>The Age Wave, The Ocean State, and Long Term Care</b>	LTC News December, 2009	E - 103
<b>A Suggestion to Do a Postmortem Analysis of the Work Done by LTC Pricing Actuaries over the Last Quarter Century</b>	Long Term Care News December, 2009	H - 136
<b>Disability Experience in the United States and Canada</b>	2009 Health Spring Meeting Session 37	H - 112
<b>The Actuary and Provider Contracting</b>	SOA 2009 Health Spring Meeting Session 57	H - 78
<b>LTC and Disability Insurance: Learning from Past Experience</b>	2009 Health Spring Meeting Session 64	H - 129
<b>Are Your Health Trends Fact or Fiction?</b>	2008 SOA Annual Meeting Session 129	H - 22
<b>Market Reform Principles</b>	AAA 05/09	B - 26
<b>Market Reform Principles</b>	AAA 5/09	E - 48
<b>Individual Mandate</b>	AAA 5/09	E - 56
<b>Gender Considerations in a Voluntary Individual Health Insurance Market</b>	AAA 05/2009	E - 61
<b>Actuarial Equivalence</b>	AAA 5/09	E - 98
<b>Health Reform in the 21<sup>st</sup> Century: Proposals to Reform the Health System</b>	AAA June 24, 2009	B - 28

<b>Value Based Insurance Design</b>	AAA 6/09	A - 78
<b>Risk Pooling</b>	AAA 7/09	E - 88
<b>Minimum Loss Ratios</b>	AAA 7/09	E - 91
<b>Transitioning to New Market Rules</b>	AAA 08/09	E - 50
<b>Merging the Small Group and Individual Markets</b>	AAA 09/09	E - 53
<b>Administrative Expenses</b>	AAA 9/09	E - 66
<b>Health Insurance Co-operatives</b>	AAA 10/09	E - 68
<b>State Level Impacts</b>	AAA 11/09	E - 85
<b>Premium Setting in the Individual Market</b>	AAA 03/10	E - 58
<b>Consumer Driven Health Plans Emerging Data Report</b>	AAA	H - 67
<b>HIPAA</b>		I - 14

## Case Study Application of Credibility Theory to Group Health Insurance

Herzog Chapter 12

### I. Introduction

- in experience rating an upper limit may be imposed on the amount of a single person's claims that are charged to a group - called the pooling limit
- this makes experience rating less sensitive to the small number of large claims

### II. General Approach

#### A. Introduction

- purpose is to estimate the expected claims for year  $n+1$  given the claims for the preceding  $n$  years
- assumptions
  - squared error loss is the appropriate loss function
  - aggregate claim amounts for observation periods are identically distributed with common distribution  $F(x_i | \Theta)$  has mean  $\mu(\Theta)$  and standard deviation  $\sigma(\Theta)$
  - $\Theta$  is an unknown parameter which must be described by a prior distribution
- method
  - consider  $E[X_{n+1} | X_1, \dots, X_n]$

- use the estimator  $a_0 + \sum a_i \cdot X_i$

- want to minimise  $E \left[ a_0 + \sum_{i=1}^n a_i \cdot X_i - E[X_{n+1} | X_1, \dots, X_n] \right]^2$

- differentiate this expression with respect to  $a_j$  and obtain a set of linear equations

$$\sum a_i \cdot \text{Cov}(X_i, X_j) = \text{Cov}(X_{n+1}, X_j) \quad \text{for } j = 1, \dots, n$$

and the equation  $a_0 = E[X] - \sum a_i \cdot E[X_i]$

- it can be shown that these expressions are valid as long as the moments exist and there is a unique set of  $a_i$ 's satisfying the two equations

#### B. General approach when $n=1$

- if  $n = 1$ , the equation for the covariance reduces to  $a_1 = \frac{\text{Cov}(X_1, X_2)}{\text{Var}(X_1)}$

- substituting in the equation for  $a_0$  and changing the notation makes  $a_1$  the estimator for the credibility.

C. General approach when  $n > 1$ 

- substituting in the equations for  $a_i$  yields  $n$  equations in  $n$  unknowns which can be solved by matrix algebra and  $a_0$  follows

## III Credibility for Group Insurance

- group policy has  $m$  risks (lives) - an employee and dependents treated as one unit

## A. Notation

- let  $X_{it}$  be the claim amount for the  $i^{\text{th}}$  risk during year  $t$  where  $I = 1, 2, \dots, m$  and  $t = 1, 2, \dots$ . Then the average claim amount for the group during year  $t$  is

$$\bar{X}_t = \frac{1}{m} \sum_{i=1}^m X_{it}$$

B. Credibility model for  $E[X_{.2} | \bar{X}_{.1} = \bar{x}_{.1}]$ 

- using the model  $Z\bar{X}_{.1} + (1 - Z)\mu$  to estimate  $E[\bar{X}_{.2} | \bar{X}_{.1} = \bar{x}_{.1}]$  where  $n = 1$  and the prior mean is  $\mu = E[X_1] = E[X_2]$  and

$$Z = \frac{\text{Covar} \left[ \sum_{i=1}^m X_{i1}, \sum_{i=1}^m X_{i2} \right]}{\text{Var} \left[ \sum_{i=1}^m X_{i1} \right]}$$

## IV. Specific Approach to Obtaining Optimal Pooling Level

- define  $X_{i1}(v) = \min(X_{i1}, v)$  where  $v$  is the unknown pooling point and  $m$  the number of employees in the group

$$\text{- let } \bar{X}_{.1}(v) = \frac{1}{m} \sum_{i=1}^m X_{i1}(v)$$

- we then approximate  $E[\bar{X}_{.2} | \bar{X}_{.1}(v) = \bar{x}_{.1}(v)]$  by  $a_0(v) + Z(v) \cdot \bar{X}_{.1}(v)$

where  $a_0(v)$  and  $Z(v)$  are parameters to be estimated.

- this estimator is better than the least squares linear estimator if

$$E \left[ E[\bar{X}_{.2} | \bar{X}_{.1}] - (a_0(v) + Z(v) \cdot \bar{X}_{.1})(v) \right]^2 < E \left[ E[\bar{X}_{.2} | \bar{X}_{.1} - (a_0 + Z \cdot \bar{X}_{.1})] \right]^2$$

- then to determine the best estimator,

$$\text{maximise } R(\nu) = \frac{\left\{ \text{Cov} \left[ \frac{1}{m} \sum_{i=1}^m X_{i1}, \frac{1}{m} \sum_{i=1}^m X_{i2} \right] \right\}^2}{m^2 \cdot \text{Var} \left[ \sum_{i=1}^m X_{it}(\nu) \right]}$$

$$\text{- and } Z(\nu) = \frac{\text{Cov} \left[ \sum_{i=1}^m X_{i1}(\nu), \sum_{i=1}^m X_{i2} \right]}{\text{Var} \left[ \sum_{i=1}^m X_{i1}(\nu) \right]} \quad \text{and} \quad a_0 = E[\bar{X}_{.2}] - Z(\nu) \cdot E[\bar{X}_{.1}(\nu)]$$

- if one examines the estimator in the form  $E[\bar{X}_{.2}] + Z(\nu) \cdot \{ \bar{X}_{.1}(\nu) - E[\bar{X}_{.1}(\nu)] \}$

One sees that the effect of pooling is to reduce the effect of extreme values on the conditional (posterior) estimate of the mean aggregate loss amount during the second policy year

- alternatively, a computer could be used to test every possible value of the pooling point to determine the best

#### V. A More General Model

Let  $\bar{X}_{.t} = \frac{\sum_{i=1}^m X_{it} P_i}{\sum_{i=1}^m P_i}$  be the average claim amount for year t. and  $P_i$  be the manual

premium for risk i. When  $P_i$  is a constant the expression reduces to  $\bar{X}_{.t} = \frac{1}{m} \sum_{i=1}^m X_{it}$

Integrate with

Bluhm Group Chapter 35

## Long Answer Questions Section H

### Questions

1. Discuss the construction of the 1960 CSG Table
2. Discuss living benefits
3. What are the considerations in selecting data for medical insurance plans?
4. Outline the programmes covered by Medicaid
5. 2 marks Discuss the macro economic factors affecting trends in health insurance.
6. What are the components of trend?
7. Outline the budgetary cost method of projecting health care costs.
8. 1.5 marks Discuss the considerations in projecting hospital per diem charges.
9. Outline the data sources for hospital inpatient use and charge data when using the budgetary cost method of projecting health care costs.
10. 5 marks Outline the most important types of data to analyse when using the budgetary cost method of projecting health care costs.
11. 3.5 marks Outline the development of fee for service charges when using the budgetary cost method of projecting health care costs.
12. Outline the handling of co-payments, coordination of benefits and reinsurance when using the budgetary cost method of projecting health care costs.
13. .5 marks What are the financial advantages of the capitation method?
14. 1 mark Discuss the federal and state regulations regarding premia for health maintenance organizations.
15. 8 marks Outline the issues which must be considered in adopting community rating by class.

**Answers**

## 1. Bluhm Chapter 29

- 1 - table based on an inter-company study
  - 1 - groups of 25 lives or more included
  - 1 - covered 1950 to 1958
  - 1+1 - 59 million life years and 400,000 claims
  - 1 - margins added at working ages
  - 1+1 - under 19 and over 70 loadings of the 1958 CSO used
- Total is 8 points. A good answer would be 8 points

## 2. Bluhm Chapter 29

- 3 - long term care type
    - 1 - provides a monthly benefit of 2% of the face amount
    - 1 - beginning with permanent confinement in a nursing home
    - 1 - some plans use permanent home health care as trigger
    - 1 - benefit paid til 50 to 100% of sum insured paid
    - 1 - remainder on death
  - 3 - catastrophic illness type
    - 1 - pays 25% of sum insured
    - 1 - upon the occurrence of a listed disease
    - 1 - policy re-written to reduced amount
    - 1 - hard to define some diseases
  - 3 - terminal illness type
    - 1 - pays 25 to 50%
    - 1 - when a physician certifies person has a terminal illness
    - 1 - that will result in death with 6 to 12 months
    - 1 - some plans discount the payments for interest
    - 1 - make an administrative charge.
      - 1 - there is no premium in such cases
      - 1 - a carrier with a 6 month clause will discount for 12 months
      - 1 - to allow for errors in the physicians' opinions, anti-selection, and fraud
  - 2 - coverage should apply to all
    - 1 - have a 30 day waiting period when introduced
- Total is 29 points A good answer would be 24 points

3. Bluhm Chapter 30

- 2 - a multitude of plans, variation in provider claim coding conventions, and group characteristics make data summarisation hard
  - 3 A. Is data appropriate?
  - 2 - data should reflect characteristics of company's portfolio
  - must normalise for
    - 1 - demographic mix
    - 1 - benefit levels
    - 1 - provider contracting details
    - 1 - rating period
  - 3 B. What level of detail is needed?
  - 2 - look at actual to expected loss ratios or claim costs across broad categories
  - 1 - choice is causing a demand for more detailed analyses
  - 2 - more detailed analyses needed when case characteristics less stable and more different
  - 3 C. Data sources
  - 1 - insurer's own data best if credible
  - 1 - may not be appropriate when characteristics changing
  - 1 - insurers may not track data at individual claim level
  - 1 - movement to managed care or consumer driven options compounds problems
- Total is 26 points. A good answer would be 21 points

4. Health Watch 2/10

- 2 - Temporary Aid to Needy Families
    - 1 - mainly pregnant women, mothers and their children
    - 1 - childless adults meeting income requirements
  - 2 - Children's Health Insurance Programme
    - 1 - covers children meeting certain criteria
    - 1 - parents may not be covered by Temporary Aid to Needy Families
  - 2 - Aged, Blind, Disabled
    - 2 - some qualify for Medicare and are called Dual Eligibles
    - 1 - mainly disabled elderly
- Total is 13 points. A good answer would be 12 points

## 5. Bluhm, Chapter 36

- 2 Wealth
  - 1+1 - increased wealth associated with increased consumption & research
  - 2 General inflation
  - 2 Physician supply
  - 2 - increased supply should decrease prices and increase quantity and quality of care
  - 1 - overall increases consumption
  - 2 More specialists
  - 1+1 - greater use of technology - more intense therapies
  - 2 Population aging
  - 1 - effect also picked up by physician supply
  - 2 Effect of third party payers
  - 1 - decreases consumers' sensitivity to cost
  - 2 Managed care
  - 1 - only recently has market penetration been enough for effects to emerge
  - 2 . Cost shifting
- Total 26. A good answer would be 22 points

## 6. 2008 Annual Meeting Session 129

- |                           |                                |
|---------------------------|--------------------------------|
| 1 - product mix           | 1 - customer/industry mix      |
| 1 - demographics          | 1 - geographics                |
| 1 - underwriting wear off | 1 - benefit plan change        |
| 1 - leveraging            | 1 - baseline use               |
| 1 - core unit cost/price  | 1 - intensity/mix              |
| 1 - policy process        | 1 - regulation                 |
| 1 - catastrophic claims   | 1 - severity adjustments       |
| 1 - workday               | 1 - health technology pipeline |
| 1 - macroeconomic effects |                                |
- Total is 17 points. A good answer would be 13 points

## 7. Sutton and Sorbo Chapter 3

- 2 - analyses demand
- 2 - translates demand into resource requirement per 1000 members
- 2 - measures of demand vary by specialty
- 2 - combine staffing requirement with average costs per physician, support staff, suppliers, etc.
- 1 - cost of some factors determined in ways similar to fee for service equivalent charges
- 1 - underlying basis is the productivity level of personnel and use patterns

J - 56

- 1 - for surgical specialties may consider allocation of time to hospital and clinical settings
  
  - 1 - table splits costs
    - 1 - primary care
    - 1 - special care
    - 1 - support staff
    - 1 - medical supplies
    - 1 - floor space
    - 1 - equipment
    - 1 - overhead
    - 1 - referrals
    - 1 - profit
  - 1 and calculates cost on a per member per month basis
- Total 22. A good answer would be 18 points

8. Sutton and Sorbo Chapter 3

- 2 - in plan's early years, plan usually pays 100% of billed charges
  - 2 - after 20,000 members, may be able to negotiate reduced hospital rates - either a fiscal charge per diem or a discount
  - 2 - must project costs for inflation - need
    - 1 - timing and percentage increases for room & board and ancillary services
    - 1 - can use "Medicare Cost Reports" Schedule D to obtain a weighted average increase in ancillary services
  - 2+2 - "Medicare Cost Reports" reflect patient population of the hospital - must adjust for prepaid plan's population i.e. at least split admissions and length of stay by type of patient under/over 65 by hospital
  - 2+2 - must adjust for prepaid plan's effect on intensity of services e.g. length of stay (shortening stay increases per diem for surgical, obstetrical, etc. by up to 10%)
    - 2 - obtain separate cost data and projections for outpatient surgery
    - 1 - usually must look at a sample of 25-50 typical procedures
- Total 19 A good answer would be 17 points

9. Sutton and Sorbo Chapter 3

- 1. For employer groups obtain local inpatient use figures
  - 1 - Blues have best information but likely confidential
  - 1 a If available want
    - 1 - admission rates
    - 1 - length of stay

- 1 - bed days/1000
- 1 - average cost per day by type of admission
- 1 - medical
- 1 - surgical
- 1 - obstetrical
- 1 - psychiatric
- 2 b Need to understand
  - 1+1 - how are routine nursery days handled? - best if added to obstetrical charges
  - 1+1 - how are 3<sup>rd</sup> party claims handled (eg. Workers Compensation?) - want either total or pro rata share
  - 2 - what discounts are received?
- 2 c In some states there is a periodic patient origin study
  - 1 - hospital use by county
  - 1 - need to be separated under/over 65
  - 2+2 - overstates employer figures due to higher usage by uninsurables, Medicare disabled, and indigents
- 2 d American Hospital Association data
  - 1 - split by state
  - 1 - possible to exclude over 65 population
  - 1 - same limitations as a patient origin study
- 2 e larger medical groups can sometimes identify a random sample of the patients who use the group almost exclusively
  - 1 - use can be obtained from its records
  - 1 - want at least 1000 individuals
  - 1 - appropriate community average age/sex mix
- 1 f other
  - 1+1 - Professional Activity Study - used to analyse length of stay by patient type
  - 1+1 - American Hospital Association provides data on revenue per patient day - but includes Medicare eligibles
- 2 g Medicare Cost Reports
  - 1 - useful for analysing hospital charges per day
  - 1 - obtained from local Part A intermediary or hospitals
  - 1 - break down total revenue for inpatient services between room and board and ancillary services
  - 1 - also provide total charges for inpatient services for Medicare eligibles
  - 1 - provides total days for all patients, Medicare eligibles and Medicaid eligibles
  - 1 - hence can get charges per day for non Medicare patients
- 2 ii Health Care Financing Administration
  - 2 - provides some use data for Medicare eligibles that can be used to adjust population data for the under 65 age group
  - 2 - provides detailed in patient use data on a regional and national basis from the National Health Survey - of limited use as regional

- 2           iii State hospital rate setting commissions and health departments

Total 56. A good answer would be 38 points

10. Sutton and Sorbo Chapter 3

- 5   . Inpatient hospital use rates
  - 2       - compare to other local health maintenance organizations
  - in developing targets consider
    - 1           - size and sex of target population
    - 1           - types of employer groups
    - 1+1       - comprehensiveness of insured local benefits - particularly maternity
    - 1           - use controls to be used
- 5   . Inpatient hospital per diem charges
  - 2       - in plans early years, plan usually pays 100% of billed charges
  - 2+1     - after 20,000 members, may be able to negotiate reduced hospital rates - either a fiscal charge per diem or a discount
    - must project costs for inflation - need
      - 1           - timing and percentage increases for room and board and ancillary services
      - 1           - can use "Medicare Cost Reports" Schedule D to obtain a weighted average increase in ancillary services
    - 2       - "Medicare Cost Reports" reflect patient population of the hospital
    - 2       - must adjust for prepaid plan's population i.e. at least split admissions and length of stay by type of patient under/over 65 by hospital
    - 2       - must adjust for prepaid plan's effect on intensity of services
    - 2       - obtain separate cost data and projections for outpatient surgery
      - 1           - usually must look at a sample of 25-50 typical procedures
- 5   . Office visit frequency
  - 2       - use health maintenance organization industry norm in the area
  - 2       - publications may only show physician encounters
    - 1           - must adjust for use of nurse practitioners, etc.
    - 1           - must ensure total consistent with other plans
- 5   . Medical group charges, ordering patterns and costs of ancillary services
  - 3       - best basis is a 12 month activity summary with a fee schedule showing number of services and charge per service split by physician specialty and Medicare/non Medicare
    - 1       - then analyse average charge for
      - 1           - office visits
      - 1           - inpatient visits
      - 1           - office procedures
      - 1           - lab
      - 1           - X ray

- 1 by specialty to obtain weighted average charge per visit/procedure
  - 2 - must consider group's physician specialties
  - 2 - adjust for inflation
  - 5 . Physician referrals and miscellaneous services
  - 2 - usually based on experience of other plans
  - 2 - adjust for own referral specialists' fees
  - 2 - for most tertiary surgical specialists use data of "Vital and Health Statistics" may adjust for use patterns of prepaid plans
  - 2 - look at cost impact of anticipated new technical procedures
  - 2 - for minor miscellaneous services such as ambulance and how health services combine local costs data with any available use data
- Total is 78. A good answer would be 53 points

#### 11. Sutton and Sorbo Chapter 3

- 5 First develop outline of covered services by budgeting category
- 3 I Hospital
  - 1 - in/out of area hospitalization
  - 1 - outpatient surgery
  - 1 - emergency room
  - 1 - skilled nursing facility
- 3 Prepaid clinic services
  - 1 - office visits
  - 1 - consultations
    - 1 - inpatient
    - 1 - inpatient - newborn
    - 1 - mental health - in/out patient
    - 1 - miscellaneous office procedures
    - 1 - emergency room
    - 1 - obstetrics
    - 1 - laboratory
      - 1 - X ray
      - 1 - surgery - inpatient/office/emergency room
- 3 Referrals, etc.
  - 1 - X ray
  - 1 - physical therapy
  - 1 - radiation therapy
  - 1 - ambulance
  - 1 - home health
  - 1 - cardiac surgery
  - 1 - neurosurgery
  - 1 - haemodialysis
  - 1 - anaesthesia
  - 1 - substance abuse treatment
  - 2 - list any copays

J - 60

Then

- 2 - above for employer groups
- 2 - special information needed for direct pay individuals, Medicare, and Medicaid
- 3 - capitation for a category depends on product of frequency of use per member per year and cost per service divided by 12
- 2 - develop factors by service category
- 2 - a subset may give the figures for the medical years
- 2 - total is base for calculating premia (add administrative expense and profit)

Total 54. A good answer would be 35 points

## 12. Sutton and Sorbo Chapter 3

### Co-payments

- 2 - look at projected use of services with copays
- 2 - frequency times copayment less allowance for bad debts and collection expenses gives the adjustment to the capitation
- 2 - if copays collected by medical group, adjust total income

### . Coordination of benefits

- really
- 2 - coordination of benefits
- 2 - subrogation
- 2 - Workers' Compensation
- 2 - generally a reduction in costs of 3-7% for
  - 1 - inpatient hospitalization
  - 1 - inpatient professional services
- 2 - provision must be in contracts
  - 1 - all could go to the health maintenance organization and not to prepaid plan or vice versa
  - 1 - reduce capitation if prepaid plan receives any payments

### Reinsurance

- 2 - adjust for premia and projected recoveries (50-60% of premia)
- 1 - medical group's share of risk for hospital inpatient costs should be limited to
  - 1 - claims up to deductible
  - 1 - plan's pro rata liability for claim amounts above the deductible
  - 1 - up to deductible for emergency out of area coverage

Total 26. A good answer would be 20 points

## 13. Sutton and Sorbo, Chapter 4

- 3 - payment received earlier (typically 2 months), improving cash flow and reducing interest costs
  - 3 - billing, except for copays, eliminated (copays usually collected at time of service)
  - 1 - bad debts reduced/eliminated
- Total 7 A good answer is 7 points

## 14. Sutton and Sorbo, Chapter 5

- 4 - in past, if Federal loan funds requested, rates had to cover all variable medical costs and provide an administrative/overhead contribution which on a percentage or per member per month (adjust for expected inflation) basis would be adequate at break even
  - 3 - if no loans, only requirement is that projected operating deficits and possible adverse deviations be covered by available financial resources
  - 3 - states only require 3-5 year financial projection and capital to meet projected losses
  - 2 - no formal minimum premium requirement
  - 2+2 - NAIC model law currently requires \$1.5 million or 3% of gross revenues to revenue level of \$150 million
  - 1 - some states want more if fee for service business written
- Total 17. A good answer would be 15 points

## 15. Sutton and Sorbo Chapter 6

## 5 Practicalities

- 2 - segmentation profiles become complicated and vary by
  - 1 - group size
  - 1 - penetration
  - 1 - strategies of major competitors
  - 1 - use of lower of traditional and rating by class leads to losses
  - 1 - must have operational data on which to base rates or data from other sources
  - 1 - rating process more complicated
  - 1 - revenue projection model must be sophisticated to assure adequate rates for groups not subject to community rating by class
  - 1 - capitation payments may need to follow same factors -
  - 1 - otherwise health maintenance organization at risk from distribution
  - 1 - computer system may need to be enhanced

- 2 - will want to continue reflecting differences in marketing and administrative costs by
  - 1 - individual contracts
  - 1 - employer groups of under 100
  - 1 - employer groups of over 100
- 5 The Reconciliation Process
  - 2 - must ensure projected rates in aggregate cover total operational costs
  - 2 - must check annually rates not biased
  - 2 - generally calculate an average composite factor - apply rating method factors to each group in the community rating by class method and one factor to the traditionally community rated groups
- 5 . Experience Rating
  - 1 - principal method of insurers and Blues
  - 2 - a minimum of 3 classes with different rating methods
    - 1 - a community rated class - groups of less than 25-100
    - 1 - fully experience rated class - groups of over 500-1000
    - 1 - in between groups - where a credibility factor is applied to experience and pooled rates
  - 1 - also consider experience refunds
    - 1 - rarely used by health maintenance organizations
    - 1 - health maintenance organizations can use in most states
    - 2 - federal legislation restricts
    - 1 - easily introduced for IPAs
  - 2 - must be able to produce fee for service equivalent charge claims for each group
- 5 Group Specific Community Rating
  - 1 - start with group specific community rating
  - 2 Community Medical Capitation x Group's group specific community rating factor plus
    - 1 - net reinsurance (premium less recoveries)
    - 1 - administration
    - 1 - premium tax
    - 1 - surplus/profit
    - 1 - state reserve
  - 1 - the group's group specific community rating factor is
  - 4 Group's Credibility factor x Group's Experience factor + (1-Group's Credibility factor) x Group's community rating by class factor
- 5 Other Issues
  - 2 - medical group's capitation may have to differ by employer - hard to administer
  - 2 - if medical group's capitation constant, the sum of the experience for different employer groups must produce the constant capitation rate
  - 2 - some health maintenance organizations only experience rate hospital costs and not the medical group's capitation or prescription drugs
  - 1 - hospital and medical costs are independent variables

- 1 - some groups will be adversely affected
  - 1 - an analysis of the effect on each group should be undertaken before implementation
  - 1 - may want to cap effects on certain groups
  - 1 - may reduce credibility factors initially
  - 1 - must adjust baseline data if multiple benefit plans offered
  - 2 - Federal employee plans require experience rating methods meet certain criteria/be approved
  - 1 - the federal group specific community rating method is prospective only
  - 2 - use of a retrospective formula means an incentive/risk sharing settlement between the HMO and the medical group needed
  - 1 - complicated if years different
- Total 96. A good answer would be 55 points

#### 16. Sutton and Sorbo

$$\text{Answer: } \frac{4.5x.4 + 2x.3 + 1x.3}{4.0x.4 + 2x.3 + 1x.3} \times 120 = 129.60$$

The single premium is \$129.60 and the others multiples.

#### 17. Sutton and Sorbo, Chapter 11

- 3. Includes
  - 2 - carve outs eg.
    - 1 - psychiatric
    - 1 - radiology
    - 1 - physical therapy
    - 1 - laboratory
  - 2 - outside subcontractors of particular services
- 3. Capitation
  - 2 - where HMO has a capitated specialty network, medical group must use it or not be compensated
  - 2 - sometimes medical group has choice of also covering specialty - must evaluate cost carefully
  - 2 - specialty capitation very cost effect for HMO but disruptive for medical group
- 3. Subcontracting
  - medical group may subcontract to
    - 1 - reduce potential volatility
    - 1 - control rate of increase
    - 1 - reduce costs