

Solution 1

(a) Traditional and Alternative Distribution Models

Distribution Models

Brokerage:

- Cheaper for smaller companies who can't afford field force
- Often used for small group market
- Exposed to price competition since brokers sell products from many competitors
- Generally paid commission

Group Field Force

- Salaried sales reps paid by company
- More loyal, can sell value not just price
- More predictable revenue
- Can penetrate more niche markets
- More costly than brokerage – need economies of scale

Direct Sales

- Often not very effective for group insurance

Multi-Level

- Combination of wholesale distributors, agents, brokers, telemarketers...
- Can find best distribution for each market/area
- Wide distribution but not as expensive as field force

Sales to Consumers

- Enrollment specialists to enroll employees
- Paid either salary or commission

Alternative Models

Internet Marketing:

- Advertising and Sales
- Provide ability to conduct transactions

Worksite Marketing

- Meet with employees at worksite
- Usually payroll deduction

Solution 1 (continued)

Major Decision Makers in Distribution Process

Distribution Channel

- Brokers – commission
- Consultants – FFS by group, expected to add value
- Financial Institutions
- Agents

Employers – several key decision makers – CFO, benefit manager, HR

Basic Needs:

- Cost/financial suitability
- Compatible with HR Objectives
- Network Access – Appropriate for population
- Choice of plan design
- Excellent local service
- Strong Partner in Health Coverage

Employee / Consumer – self reliant, well educated, will pay for valued product

Decision criteria

- Low OOP costs
- Choice of plan design
- Access to service info
- Easy/less paperwork
- Plan an administrator
- Provider a resource

Provider - Key to employee satisfaction

(b) Market Segments

Industry

Geographic Area

Size Segments:

Solution 1 (continued)

Small 2-50 EE's

- Heavily regulated
- Rely on broker for info
- Need low expense to be competitive
- Min Loss Ratio requirements

Smaller / Medium Groups 51 – 100 EE's

- Less regulation
- Prefer group field force distribution

Moderate Groups 100-500 EE's

- Experience plays a large role
- Group field force used
- Self insuring an option

Large Groups 500+ Employees

- Multi-site
- Fulltime benefits staffing

Solution 2

- (a) Managed Care companies that tighten care management may experience lower trends
 Managed care initiatives that affect trends, also affect the cost levels
 Useful measure is approval percentage of dollars of claims: Paid v. submitted claim ratio.
 As percentage rises over time, may indicate a less restrictive form of managed care.
 Precertification, Preauthorization and utilization may create a sentinel effect, limiting services by providers
 Sentinel effect can lead to tightly managed MCO with high approval percentage.
 Programs, or lack of them, can result in trends persistently above or below the prevailing force of trend.

(b)

		Members (1000's)	Table MM-6a Incurred \$\$	Hosp PMPM	Yr over Yr Qtrly trend Hosp	Table MM-6b Incurred \$\$	Avg Qtrly Non-Hosp PMPM	Yr over Yr Qtrly trend Non-Hosp	Avg Qtrly Total PMPM	Yr over Yr Qtrly trend Total
7	2001	943	50,700			44,500				
8	2001	939	48,533			44,018				
9	2001	937	49,550	52.78		44,935	47.34		100.12	
10	2001	945	52,324			47,455				
11	2001	945	50,370			46,287				
12	2001	945	54,575	55.47		52,477	51.58		107.05	
7	2002	969	57,934			51,387				
8	2002	974	59,439			54,828				
9	2002	974	60,365	60.93	15.4%	54,458	55.08	16.4%	116.01	15.9%
10	2002	976	61,457			56,128				
11	2002	980	66,057			60,999				
12	2002	979	106,725	79.81	43.9%	79,912	67.13	30.2%	146.94	37.3%

(c)

The fourth quarter trend is heavily influenced by the completion factor used to estimate ultimate costs
 Recommendation is to use third quarter year over year trend of 15.9% in total, 15.4% for hospital and 16.4% for non hospital.

Solution 2 (continued)

Use 3Q instead of 4Q because IBNR is distorting the PMPM estimates for November and December 2002.

4Q over 4Q has considerable lag built into the calculation of the incurred estimate. Too much variability in the lag adjustment.

(d)

Hospitals delivering 1/3 of the care will accept 10% less

Hospital Trend: **15.4%**
Non-Hospital Trend: **16.4%**

2/3 at non-discounted hospitals:

1/3 of facility care at discounted hospitals

Hosp PMPM 2002	\$60.93	x	
1+ Trend	115.4%	=	
Hosp PMPM 2003	<u>\$70.32</u>		66.67%

Hosp PMPM 2002	\$60.93	x	
1+ Trend	115.4%	x	
Discount	<u>0.9</u>	=	
Hosp PMPM 2003	\$63.28		

Non-hospital PMPM 2002	
1+ Trend <u>116.4%</u>	
Non-hospital PMPM 2003	64.11

Non-hospital PMPM 2002	55.08
1+ Trend <u>116.4%</u>	
Non-hospital PMPM 2003	64.11

Total PMPM 2003 134.43

127.40

Weight together 1/3 and 2/3

$$134.43 * 2/3 + 127.4 * 1/3 = 132.09$$

Trend decreases from 15.9% to 13.85%.

$$\text{Revised total trend} = 132.09 / 116.01 - 1 = 13.85\%$$

(e)

Membership increase from 979,000 to 991,000

Members	2003 cost (from part d)	
979	132.09	13.85%
12	127.40	9.81% (= 127.4 / 116.01)
991	132.03	13.81% (= 132.03 / 116.01)

0.04% trend change

Given the small change in trend and the fact there is no guarantee all the new members will use the lower cost hospitals all of the time, I would not reduce estimate.

Solution 3

(a)

For employers:

1. Rising medical expenses with difficulty to shift costs to employees;
2. Increasing liability exposure (exposure to lawsuits);
3. Changing employment relationships (benefit portability important);
4. Complex as well as costly administration of health care benefits.

For employees:

1. Employees do not have adequate choices to match their health care needs;
2. Employees face coverage disruptions when employer changes insurer or plan design, or when changing jobs;
3. Employees have limited choice (compared to consumer's choice when buying other goods) to select the level of benefits, doctors, hospitals and even health insurance.

(b)

Key implementation considerations for an employer adopting a PDHB approach:

1. **Number of Employees:** has great influence on which PDHB approach and implementation strategy to follow. This is important because of federal and state regulations. Large employers can self-fund and experience rate compared to small groups. Large groups have more latitude to design a PDHB that meets their own needs; small groups will be constrained by what is in the market. As a large group, Bailey Industries has the capacity to design its own PDHB program that meets its particular needs; also its cost will be less than small employers.
2. **Employee Population Type:** Employers with collective bargaining units or those with many retirees may not feel that a PDHB a good strategy in the near future. Also, PDHB requires greater information needs that may not be available for certain groups. Bailey is a white collar, highly paid group, with only 8-years average service; also the company has the needed resources for information needs. Looks like a PDHB suits Bailey in this regard.

Solution 3 (continued)

3. Human Resources, Business Objective / Philosophy: The whole PDHB is based on increasing employee responsibility as the best way to accomplish efficiency in health care delivery. Not all employers will take this idea to the same extent. Looks like Bailey Industries have the needed resources and the required belief to implement a PDHB strategy (as stated in this problem, "Bailey is considering the adoption of a new medical plan with PDHB benefits").
4. Whether health care benefits are currently in place: PDHB is a good way for smaller employers who would like to offer their employees some sort of health care benefits. However, implementation requires educating employees, finding options in the market, administration ... etc. Larger employers, like Bailey, already have health care benefits and plenty of experience. Bailey can start PDHB with much lesser difficulties.
5. Available Options in the Area: A PDHB product may not be available in the market for interested employers. Bailey needs to research available options in the area.
6. Available Resources to Manage Health Care Benefits: To decide on which PDHB strategy depends on employer's resources to manage benefits. Employee education is very important and will need plenty of resources. Bailey Industries seems to have all required resources to implement a PDHB strategy. Bailey had experience managing its own health care benefits.

(c)

Models used to predict selection costs:

1. Choice Model: is based on claims probability distribution. Best coverage choice is identified for each person based on his/her needs (assuming knowledge of future expenses), and the cost is compared with group's cost without choice. The model assumes insured know their future medical cost and assigns them to the plan that maximizes their net benefit. This model can be used to evaluate cost for Bailey Industries.
2. Member Utilization Cost Model: This model is based on split of costs by service type. In this model it is assumed that financial incentives will influence decisions about routine care; but have little or no influence on care for serious conditions. The model separates health expenses by

Solution 3 (continued)

service type, and then applies utilization factors that vary with service type and member cost sharing. Then, as a final step, reduce total utilization adjustment by member cost sharing in the base experience. This model can be used in the case of Bailey Industries.

3. Duration Claims Model: Based on early duration claims kept down by health status underwriting. The model involves studying health cost in the most current period, then categorizes claims by month since issue, then graphs claims PMPM after adjusting for benefits mix and demographics, and then obtain ratio for current to ultimate claims and use for pricing. This method is not appropriate for Bailey Industries; this method is used by small group insurers (health status underwriting is not applicable in Bailey Industries employees case).
4. Cumulative Anti-selection Model: Based on the tendency of sick persons to retain coverage while healthy persons find other health insurance somewhere else. This model is appropriate for individual carriers facing anti-selection lapse. This model is not appropriate for Bailey Industries, as company employee cannot take employer cash and try to shop on their own (i.e. healthy and young can not leave the group and leave the older or unhealthy behind).

(d) (i)

Employees with \$0

- choose option B for least cost to them (greater PHA rollover)
- cost to employer = \$1,250

Employees with \$1 - \$1,000

- cost for option A = \$400 - \$500 = -\$100
- cost for option B = \$400 - \$1,250 = -\$850
- choose option B
- cost to employer = \$1,250

Employees with \$1,000 - \$2,000

- cost for option A = \$1,000 + 10% x \$500 - \$500 = \$550

Solution 3 (continued)

- cost for option B = $\$1,500 - \$1,250 = \$250$

- choose option B

- cost to employer = $\$1,250$

Employees with $\$2,000 - \$5,000$

- cost for option A = $\$1,000 + 10\% \times \$2,500 - \$500 = \750

- cost for option B = $\$2,000 + 20\% \times \$1,500 - \$1,250 = \$1,050$

- choose option A

- cost to employer = $90\% \times \$2,500 + \$500 = \$2,750$

Employees with $\$5,000+$

- cost for option A = $\$1,000 + 10\% \times \$24,000 - \$500 = \$2,900$

- cost for option B = $\$2,000 + 20\% \times \$23,000 - \$1,250 = \$5,350$

- choose option A

- cost to employer = $90\% \times \$24,000 + \$500 = \$22,100$

Option A cost to employer with no choice = $\$500 + 15\% \times \$0 + 40\% \times \$0 + 15\% \times (\$500 \times 90\%) + 15\% \times (\$2,500 \times 90\%) + 15\% \times (\$24,000 \times 90\%) = \$4,145$

Option B cost to employer with no choice = $\$1,250 + 15\% \times \$0 + 40\% \times \$0 + 15\% \times \$0 + 15\% \times (\$1,500 \times 80\%) + 15\% \times (\$23,000 \times 80\%) = \$4,190$

Average cost with choice = $15\% \times \$1,250 + 40\% \times \$1,250 + 15\% \times \$1,250 + 15\% \times \$2,750 + 15\% \times \$22,100 = \$4,602.50$

Average cost with no choice = $50\% \times \$4,145 + 50\% \times \$4,190 = \$4,167$

Maximum adverse selection cost = $\$4,602.50 / \$4,167 = 1.105$

Solution 3 (continued)

(d) (ii)

Adverse selection will be less than the amount calculated by a choice model for the following reasons:

1. Some insured are risk adverse and might choose rich benefit plan for peace of mind (not based on economic reasons).
2. Insured usually do not have perfect knowledge of future costs.
3. Some insured must select coverage for family and what is best choice for one family member may not be the best choice for another member.

(d) (iii)

1. Some employers might limit types of available choices or even eliminate some choices.
2. Aggregating large groups of persons in one risk pool. Pooling may be based on geographic location, demography, etc.
3. A PDHB program that applies personal health account to pre-planned expenses and insurance plan for insurable losses may reduce adverse selection in the current models. Financial modeling is needed to succeed.
4. Employer can vary its contributions to employees using risk adjustment methods (actual utilization, behavior patterns, etc.)
5. Employers may relate contributions to employees so as to promote wellness like exercise programs.

Solution 4

- (a) Assumptions to be considered when calculating a PDR:
- 1) Enrollment: Realistic enrollments need to be included in the projections. Aging of the block should reflect historic levels of underwriting wear-off. Lapses should reflect potential anti-selection.
 - 2) Claims Trend: Anticipated claims cost inflation must be included in the calculations.
 - 3) Rate Increase: Should be at levels likely to be implemented under regulatory and/or market constraints.
 - 4) Expenses: Expenses related to the policy group should be included in the losses projection.
 - 5) Taxes: PDR should be calculated on after-tax basis using estimated tax rate for the company.
 - 6) Provider Arrangements: Provider settlements must not be used to reduce claim costs unless billed to providers (under risk sharing agreements).
 - 7) Interest Rate: Reasonable IR only may be used to discount present value of deficiencies.
 - 8) Conservatism: Realistic assumptions should be used to calculate DR.

- (b) Recommended groupings:
The groupings should aggregate policies according to how they were rated, marketed, serviced, or measured for performance. The groupings should also be large enough.

Major Medical Division:

- Fully Insured Indemnity
 - Individual
 - Small Employer (<=50 employees)
 - Large Employer (>50 employees)

- PPO
 - Individual
 - Small Employer
 - Large Employer

Group Life & Disability Division:

- Group Life Policies
- Group Long-term disability
- Individual Long-term disability
- Group Long-term care

Solution 4 (continued)

Managed Care Division:

- MCO (only one/Bedford Group)

ASO Division:

- Large employers only

(c)

$$\text{Termination Rate} = 98,304/122,800 = 0.8$$

$$\text{CY 2003 Member Month} = 98,304 \times 0.8 = 78,643$$

$$\text{Expense 2003} = \frac{78,463}{1.75} \times 20 = 898,777$$

$$\text{Prem. 2003} = 31,123,8008 \times 1.12 \times 0.8 = 27,886,215 \text{ *limited to 12\% by state regulation}$$

$$\text{Claim Trend} = (1 + 0.12)^{12} = 1.1539$$

$$\text{Claim 2003} = 26143327 \times 1.1539 \times 0.8 = 24,133,428$$

$$\text{Commission 2003} = 0.1 \times 27,886,215 = 2,788,622$$

$$\text{Prem. Tax 2003} = 0.02 \times 27,886,215 = 557,724$$

$$\text{Current Reserves} = 0$$

$$\begin{aligned} \text{PDR} &= \text{PV Claim Cost} + \text{PV Expenses} - \text{PV premium} - \text{Current Reserve} \\ &= 492,338 \end{aligned}$$

Solution 5

Pooled Loss Ratio = Claims under Pooling Point (\$50,000) / Gross Premium

$$7/00-6/01 \text{ LR} = (3,397,000 + 905,000) / 5,800,000 = 74.17\%$$

$$7/01-6/02 \text{ LR} = (4,644,000 + 692,000) / (6,480,000 + 1,080,000) = 70.58\%$$

$$\begin{aligned} \text{Multi-year Loss Ratio} &= 75\% * \text{Year 2 LR} + 25\% * \text{Year 1 LR} \\ &= 75\% * 70.58\% + 25\% * 74.17\% = 71.48\% \end{aligned}$$

Charged Claims = Premium by Option * Multi-year LR

$$\text{Option 1} = 6,480,000 * 71.48\% = 4,631,904$$

$$\text{Option 2} = 1,080,000 * 71.48\% = 771,984$$

Adjusted Charged Claims = Charged Claims * Trend * Region Adjustment * Benefit Adjustment * Age/Sex Adjustment

$$\text{- Trend to 9/1/03 from 1/1/02} \Rightarrow 1.009^{12} * 1.012^8 = 1.225$$

- Adjust back to base Region, Benefit, and Age/Sex Levels

$$\text{Option 1} = 4,631,904 * 1.225 * 1/1 * 1/0.75 * 1/1.05 = 7,205,184$$

$$\text{Option 2} = 771,984 * 1.225 * 1/1 * 1/0.70 * 1/0.80 = 1,688,715$$

$$\text{Total} = 8,893,899$$

Group is 100% credible, so do not need to adjust to manual

Adjust claims for Exposure Size = Adj. Charged Claims * Family Fctr / Average Fctr

$$= 8,893,899 * 2.50 / 1.75 = 12,705,570$$

Develop Gross Premium (3000 employees = 2400 Option 1 + 600 Option 2):

$$\text{Add Pooling Charge * Trend} = 35 * 1.012^{12} * 12 * 3000 = 1,290,600$$

$$\text{Add Administrative Expense} = 12 * 12 * 3000 = 432,000$$

$$\text{Divide by Profit \& Commission} = (\text{Adj. Claims} + \text{Pool Chrg} + \text{Admin}) / (1 - 0.03 - 0.05) = 15,682,793$$

$$\begin{aligned} \text{Adjust for Region, Age/Sex, and Benefit for Option 1} &= 15,682,793 * 1.0 * 1.05 \\ &* 0.75 = 12,350,199 \end{aligned}$$

$$\text{Convert to PEPM} = 12,350,199 / 3000 / 12 = 343.06$$

$$\text{Annualize} = 343.06 * 12 = 4,116.72$$

Solution 6

a) Competitive Strategies

Price

- Lower cost distribution system
- Effective use of technology
- Relocate for cheaper labor costs
- Could price at a loss to gain market share
 - Disruptive to market
 - Short term only

Differentiation

- Unique product
- Higher quality product
- Better customer service
- Better experience-rated cost containment

Niche Marketing

- Specialized knowledge of customer base

b) Strategies by Division

ASO

- Differentiation
 - Top 5 nationally
 - Strong reputation
 - Wide range of services & products
 - Rents out PPO network

Major Medical

- Differentiation
 - Top 3 nationally
 - Developed own provider network
- Price
 - Aggressive provider contracting allows low price

Group Life & Disability

- Differentiation
 - Entered Long Term Care Market

Managed Care

- Niche Marketing
- Focused for future on specific locations

Solution 7

(a)

- Financial Management should rely on best estimates and actual up to date information where available.
- Initial reserve estimates may prove to be inaccurate, so using those estimates will distort actual incurred claims.

(b)
$$\text{ROE} = \frac{\text{gaap profits}}{\text{gaap capital \& surplus}} = 15\%$$

profits consist of underwriting gain + investment income – taxes

2002 investment income = 3% of prem.

2002 taxes – 1.6% of prem.

$$\frac{\text{u/w gain} + 340 \text{ prem.} - 1.6\% \text{ prem.}}{1840 \text{ prem}} = 15\% \quad \text{u/w gain objective} = 1.3\% \text{ of prem.}$$

$$\text{Loss Ratio} = \frac{\text{incurred claims}}{\text{earned premium}}$$

if u/w gain objective = 1.3% of prem., then incurred claims + expenses = 98.7% of prem.

operating expenses have been running at 15.1% of prem.,

so Loss Ratio objective = 98.7% - 15.1% = 83.6%

(c)
$$\text{EVA} = \text{Profit} - \text{cost of capital}$$

$$= \text{profit} - 10\%$$

2000: Total claims expense is listed as 1,004,200 in financial statement. This matches the total of updated data in MM-6a and MM-6b. If 12/31/99 IBNR was understated by 50,000, then 12/31/00 must be understated by 50,000 as well, since paid claims + Δ reserve was accurate operating earnings after tax = 4.1% of prem.
 surplus = 18% of prem.

$$\text{EVA as \% of capital invested} = \frac{4.1}{18} - 10\% = 12.8\%$$

2001: incurred claims reported = 1,129,000
 restated = 1,126,224
 restated operating earnings before tax = 83,000 + 1,129,000 – 1,126,224 = 85,776

$$\text{after tax} = 85,776 \times 0.62 = 53,181 = 3.76\%$$

$$\text{EVA as \% of capital invested} = \frac{3.76}{18} - 10\% = 10.9\%$$

Solution 7 (continued)

2002: incurred claims reported = 1,283,000
restated = 1,378,977

restated operating earnings before tax = $81,000 + 1,283,000 - 1,378,977 = -14,977$
after tax = $-9,285 = -0.6\%$ of prem.

EVA as % of capital invested = $\frac{-0.6}{18} - 10\% = -13.3\%$

Solution 8

(a)	A	B	B/A	
Table MM-4b	11/02	12/02	Age-to-Age Development	
Aug-01	48,500	48,500	1.0000	x
Sep-01	49,400	49,500	1.0020	x
Oct-01	52,100	52,200	1.0019	x
Nov-01	50,100	50,200	1.0020	x
Dec-01	54,200	54,300	1.0018	x
Jan-02	51,100	51,200	1.0020	x
Feb-02	49,700	49,700	1.0000	x
Mar-02	57,400	57,600	1.0035	x
Apr-02	53,800	54,100	1.0056	x
May-02	52,000	52,400	1.0077	x
Jun-02	53,300	54,800	1.0281	x
Jul-02	53,500	55,000	1.0280	x
Aug-02	52,800	55,100	1.0436	x
Sep-02	48,400	53,300	1.1012	x
Oct-02	35,600	49,300	1.3848	x
Nov-02	4,100	39,200	9.5610	
Dec-02		8,100		
Subtotal			=	
(b) Product of Age-to-Age Development Factors			16.5121	
			x	
			8,100	
		Estimated Incurred Claims for 12/02:	=	133,748
Subtotal				

Solution 8 (continued)

(c)

- Historical lag pattern will be an accurate representation for the payment of claims that have been incurred but not yet completely paid
- Able to record an incurral date & a payment date for each claim
- Fairly consistent lag pattern in the progression of claims
- Short duration relative to ultimate run-out
- Sufficient volume of business in a given valuation cell
- Requires premium or contracts to adjust for volume changes.
- Don't have to wait for the ultimate development

Solution 9

(a) **For LTD:**

(i) **Automatic Excess:**

- Direct writer retain first X dollars of coverage and reinsurer assume the excess.
Preferred by large insurer.

2 variations:

- **Extended Elimination Period (aka Excess Duration).** Direct writer retain first n months of disability income payment and reinsurer assumes the excess.
- **Specified dollar amount**
Direct writer retain first X dollars of cumulative payment (compared to first X dollars of monthly payment for traditional automatic excess) and reinsurer assumes the excess.

(ii) **Facultative: Coinsurance or Quota Share.**

- Preferred by smaller insurer who needs more support from reinsurer
- A fixed percentage of coverage is reinsured
- Reinsurer provides net premium to which insurer add its own expense load.

For LTC:

- (i) **Coinsurance or Quota share.** A fixed percentage of coverage is reinsured.
- (ii) **Automatic Excess**
- (iii) **Modified coinsurance**

(b) **LTC:**

- Claim Cost Slope steep
- Low frequency, high severity product
- New Product
- Future of claim cost debatable
- Product is capital intensive: Reserve Strain
- Reinsurer has an advantage: Help insurer avoid past mistakes of this new product. Reinsurer has access to experience of many insurers.

LTD:

- Low frequency, high severity product
- Product is capital intensive
- Amount of total benefit payment not known until end of disability
- High volatility of experience

Solution 10

- (a) Importance of measuring medical effectiveness:
- Measuring medical effectiveness was motivated by the escalating cost of health care in the U.S over the last several years. As a result, cost management efforts had increased with particular emphasis on improving quality of health care.
 - Higher quality services believed to be less expensive; also it is believed that “you cannot control what you cannot measure”. That means it is important for cost containment to measure medical effectiveness.
 - If providers medical effectiveness is measured, the quality of medical care will be effective and this will lead to controlling cost.
 - It is important if we need to compare quality of care between different provider groups.
 - Consumers, employee benefit managers, and health plan managers will be able to use the measurement reports to make better buying decisions.
- (b) The main health plan performance evaluation categories:
- Access: Measured as the opportunity to receive health care treatment or by actual treatment received. Geographic information systems can be used to measure distances between providers and actual or imputed geographic locations. It is important for any health plan to clearly identify the method used in the calculation of accessibility measure, the access standard, etc. one measure of accessibility is the ratio of providers to enrollees.
 - Cost & Financial Measures: cost depends on the benefits provided by the plan, the covered population, etc. cost information provided should cover gender, age, health status, etc. Definitions of cost components like administrative cost should be consistent. Reserving methodology should be identified as part of the financial information.
 - Member Satisfaction: surveys might be used to measure member satisfaction; if so, standard surveys should be utilized. The health plan should explain the survey instrument used (phone, face-to-face, ...), how sample was selected, the statistical confidence, etc. sometimes enrollment/disenrollment rates are used to appraise member satisfaction.
 - Measuring Medical Effectiveness: multiple measures are recommended rather than one measure to measure medical effectiveness. Measures normally used include cost and utilization statistics, preventive health care measures, compliance with practice guides, proxy indicators, and health status outcome.

Solution 11

- (a) Calculate the expected gross premium for this product

Outcome	Frequency	Severity	Pure premium
1	25 %	\$ 875	\$ 219
2	50 %	\$ 750	\$ 375
3	75 %	\$ 550	\$ 413

Average = 335

Expected gross premium = 335 / 0.8 (loss ratio) = \$419.27

- (b) Calculate the credibility

Credibility = $n/(n+K)$

n = number of observations = 7

K = Expected Value of the process variance / Variance of hypothetical means

Variance of hypothetical means

Outcome	Pure premium	(Pure premium – average) ²
1	\$ 219	13,611
2	\$ 375	1,567
3	\$ 413	5,942

Variance = 7,040

$K = 133,581/7,040 = 18.975$

Credibility = $7 / (7+18.975) = 26.9 \%$

- (c) Calculate the credibility weighted total premium for this individual

Experience premium = $(2,500 / 7) / 0.8 = 446.43$

Expected premium = 419.27

Credibility weighted total premium = $(26.9 \% \times 446.43) + ((1-26.9\%) \times 419.27) = 426.59$

Solution 12

(a)

Measures of Claims Quality

Overall Accuracy - % claims paid correctly with no errors - financial or non-financial

Good range is 95%

Payment Accuracy - % claims that pay the correct amount but still could have other errors/non-financial

- could include payee name, address, etc

Good range is 97%

Financial Accuracy - dividing sum of absolute errors (over and under) by total amount paid

Good range is 99.3%

(b)

1. Check eligibility
 - was claimant enrolled when claim was incurred
 - was policy in force when claim was incurred
2. Check for pre-existing conditions
 - was the claim the result of a condition not disclosed at issue
 - could be grounds for denial
3. Is benefit being claimed for covered?
 - check coverage eligibility
4. Proof of Loss
 - has insurer received notice of claim including bills, APS, hospital and medical records
 - includes date services rendered
5. Determine eligible charges
 - should policy be contested
 - what amount is eligible under the plan
6. Determine gross/allowed charges
 - apply basic contract parameters to determine gross benefit level
 - includes application of deductibles, copays, coinsurance, out of pocket maximums, policy maximums
7. Determine net benefit level
 - consider existence of other plan liability either coordination of benefits (COB) or subrogation

Solution 12 (continued)

8. Actually making payment
 - to whom should payment be made
 - statement accompanying payment as to how amount determined and any assignment
9. Is there a network of providers under contract
 - payments made directly to providers
 - if capitation, claims processed but no actual payment
 - payment levels may differ by provider
10. Degree of Healthcare management
 - did claim have necessary pre-authorization
 - medically appropriate/necessary
 - care protocols to establish acceptable reimbursement patterns

(c)

Internal Data Sources

Claim form- patient name, DOB, address, procedure, diagnosis/DRG codes, provider name
Hospital Claim Form (UB-92)
Physician Claim Form (HCFA-1500 now CMS)

Medical claims systems - stores claim form info as well as a host of other data

Premium and eligibility system - make sure premiums have been paid and are up to date
- also check to see if claimant is still eligible (on group)

Provider Contracting system -stores provider status (are they active)
- also stores payment arrangement (FFS, capitated, etc)

Utilization Review and Pre-Certification

-stores useful notes for inpatient claims
- logs requests for pre-certifications and provides authorization for type of service performed

Solution 12 (continued)

(d)

Audit Issues

1. Was claimant eligible at time of service?
 - was policy inforce when claim incurred

2. What was provider status and payment arrangement
 - contractual or non-contractual
 - were contract arrangements followed correctly?

3. Were written procedures and guidelines followed when claim adjudicated
 - does company comply with own rules (whether rules are right or wrong)

Solution 13

(a) Capitation

Traditional forms of Capitation:

- Capitation transfers the financial risk of healthcare to the doctors, and doctors receive fixed monthly fee for every member in the plan (without regard if the member receives services or not). Doctors must provide all services no matter what the cost is.
- Full Risk Capitation: In the method physicians carry all the risk of providing health care for a fixed PMPM rate. The fee covers primary and specialty care; if the physician refers a member to a specialist, he/she must pay the bill. Large physician groups contract under this method because they can get favorable rates with specialists. Also, large groups can bear the downside risk.
- Global Capitation: This is one step further compared to the previous method. The Capitation payment here covers all medical expenses including institutional and professional ones. Integrated delivery systems (IDS) usually use global capitation.
- Case Rate, Global Fee or Flat Rate: A bundled case rate or package pricing is established as a single fee for a set of given services. The physician receives the same fee each time regardless of how much time he/she actually spends with a patient.
- Salary – This is the staff model HMO where the physician is a salaried employee of the health plan.

New Alternative forms of Capitation:

- Contact Capitation: This is a modification to the traditional capitation to suit specialty physicians. In this form, specialist physician is paid a lump sum upon his/her first encounter with a new patient. The payment represents the average cost of healthcare and should cover a whole contact period (6 or 12 months). The specialist is responsible for all required care during the contact period. The capitation payment usually includes a risk adjustment according to severity of illness.
- Physician DRG's - This form is still underdevelopment but allows a set payment for a given diagnosis group. The amount is usually adjusted for severity.

Solution 13 (continued)

- **Market Share Capitation:** This form uses market share to allocate capitation between specialty groups. If a certain specialty group sees 10% of the patients, then that specialty group will get 10% of the monthly capitation budget for that specialty type. This method requires historic referral data to base payments. This method is suitable for single specialty groups, but not suitable for individual physicians in a multi-specialty group.

(b) Incentives

Traditional forms of incentive plans:

- **Incentives** are supposed to make physicians practice in a certain way. A separate account is usually set for the money allocated for the incentive program (pool account). Physicians are well informed on the account value and how it will be distributed.
- **Withholds:** A certain percentage of the physician's income is withheld by the plan to cover excess medical expenses. After paying all claim expenses, the physician gets the leftover at year end.
- **Bonuses:** According to a pre-specified performance criteria, the physician will get a bonus at year end. Newer bonus criteria use benchmarks not related to utilization (to medical expenses only)

New Alternative forms of Incentive Plans:

- **Quality-Based Incentives:** These are usually bonus programs that use information on quality of healthcare. Some quality of care criteria: use of practice guidelines, member satisfaction surveys, number of member complaints, preventive care measures. This form worked well in the field of workers' compensation
- **Fee Incentive Method:** This form uses a flat fee to change the behavior of physicians. For example, HEDIS can be monitored so as to increase preventive care. If a physician gets high performance HEDIS scores, he/she will be paid higher fee schedule.
- **Gainsharing:** This arrangement is usually between a hospital and its physicians. The physicians will receive a share of the hospital savings. This method is good when the physicians reimbursement is according to fee schedule, but hospital is paid on a DRG basis. This method is not allowed in federal programs and has had limited use in non-federal programs

Solution 14

- (a) list general types of delivery systems

Indemnity plans

- Fee for Service or scheduled indemnity, pay up to certain amount
- access to any dentists
- Usual Customary and Reasonable (UCR) plans cover up to UCR limit subject to deductibles, coinsurances and plan maximums

Preferred Providers

- plan takes advantage of contracted fees with providers
- plan design is same whether in or out of network
- out of pocket expenses reduced if in-network
- various forms of PPO's
- discounted fee for service
- fee schedule FFS
- EPO exclusive provider organization
- POS - hybrid of indemnity, PPO and DHMO
- discount referral plans - discount cards (not insurance)

DHMO - Dental HMO

- Prepaid or capitated
- Independent Provider Association - pay capitation to independent providers
- Staff model HMO's - providers are EE's of HMO and are salaried

- (b) Plan provisions and Claims Practices

Plan provisions

- exclusions - cosmetic, experimental, on the job injury, no orthodontia
- pre-existing conditions - missing tooth
- benefits after insurance ends - only pay claims after coverage ends if within 31 days
- incentive coinsurance
- benefits are provided at lower coinsurance for Type II and III coverages unless utilize type 1

Solution 14 (continued)

Claims Practices

1. dental review for difficult claims
 - use dental professionals as consultants to review difficult claims
 - need sophisticated adjudication system to properly adjudicate claims
 - check eligibility, age and frequency limitations
2. LEAT - Least expensive Alternative treatment
 - limit reimbursement to least expensive alternative that is still appropriate
3. COB - coordination of benefits
 - to avoid paying in excess of charges
4. Predetermination
 - if treatment expected to cost more than \$x then require pre-treatment review
5. UCR - Usual, Customary and Reasonable
 - limit payment to dentist usual fee or fee level customary for area or reasonable charge if unusual situation

(c) challenges to e-commerce

1. No clear leader to follow – no one sets the pace, discourages others to follow
2. No clear standards for transactions - changing with HIPAA
3. Financial impact cannot be measured - reluctant to make changes
4. Security and privacy regulations are a barrier - result of HIPAA
5. Integration with legacy systems is cumbersome - hard to eliminate so have to figure out how to work with
6. Processing problems become public - internal weaknesses become more visible
7. Local needs do not match national needs - different e-commerce approaches
8. Must adopt e-commerce mindset
9. Accept that e-commerce is continually changing
10. Adopt rapid, iterative approach (changes in less than 3 months)
11. Build good technical infrastructure

Solution 15

(a)

2002 actual days / 1000 (Table MC-2)

	Hosp ID1	Hosp ID2	Hosp ID3	Total
Medical	70	30	20	120
Surgical	60	20	10	90
SNF	5	5	0	10

Hosp	Medical Reduction	Surgical Reduction
ID 1	1.0%	0.5%
ID 2	2.0%	2.0%
ID 3	1.5%	1.0%

2002 Change in days/1000

Medical: Current days/1000 x Percent medical days shifted to SNF
 Hosp ID 1 = $70 \times 0.01 = 0.7$
 Hosp ID 2 = $30 \times 0.02 = 0.6$
 Hosp ID 3 = $20 \times 0.015 = 0.3$
 Total medical = 1.6 days / 1000

Surgical: Current days/1000 x Percent surgical days shifted to SNF
 Hosp ID 1 = $60 \times 0.005 = 0.3$
 Hosp ID 2 = $20 \times 0.02 = 0.4$
 Hosp ID 3 = $10 \times .01 = 0.1$
 Total surgical = 0.8 days / 1000

SNF: Total medical & surgical days shifted to SNF for all 3 facilities
 = $1.6 + 0.8 = 2.4$ days / 1000

2002 Change in ALOS (average length of stay)

Current:

Medical = 27 admits/1000 from Table MC-2

Surgical = 18 admits/1000

Total = 45 admits/1000

Days/1000 = Med + Surg days/1000 = $120 + 90 = 210$

ALOS = $210/45 = 4.67$ days

Solution 15 (continued)

Med/Surg days after reducing for SNF days:

Medical = $120 - 1.6 = 118.4$ days/1000

Surgical = $90 - 0.8 = 89.2$ days/1000

Total = 207.6 days/1000

ALOS = $207.6/45 = 4.61$ days

Change in Med/Surg ALOS = Shifted ALOS – Current ALOS =
 $4.61 - 4.67 = - 0.06$ days

- (b) Gatekeepers have varying levels of authority depending on system
- EAP – Employee Assistance Program
 - Counselors are numerous, knowledgeable, cast a wide net
 - Contact is early before problem is major
 - Counselors not all credentialed and qualified
 - Counselors lack medical background
 - Counselors may not be philosophically aligned with Behavioral Health program goals
 - PCP – Primary Care Physician
 - Many MCOs require PCP approval for services
 - Encourages continuity of care
 - Prevents unnecessary use of specialty services
 - Medical clinicians shown to be less likely to detect or treat mental disorders
 - Mental Health & Substance Abuse Case Manager and Assessor
 - Case managers do initial assessment over phone
 - Assessors do face-to-face evaluation and treatment planning
 - Few systems successful in matching cases to specific provider disciplines
 - Many systems successful in matching clinicians or assessor to case by specialty interests, gender, language, ethnicity

Solution 16

(a)

Capitate Hosp ID1 for inpatient.

<u>Service</u>	<u>Utilization</u> (Table MC-2)	<u>Rate</u> (Table MC-7)	<u>PMPM</u>
Medical *	70	\$ 1,200.00	\$ 7.00
Surgical *	60	\$ 1,500.00	\$ 7.50
Alcohol & Drug Abuse *	2	\$ 600.00	\$ 0.10
Maternity **	13	\$ 2,200.00	\$ 2.38
Skilled Nursing Care **	0.5	\$ 600.00	\$ 0.03
Total Medical			\$ 17.01
Admin	8%		\$ 1.58
Risk	6%		\$ 1.19
Total cap			\$ 19.78
Total = 17.01/ (1-.08-.06)			
Pmpm= util x rate / 12000			

* = days, rates per day

** = admits, rate per case

(b)

Assumptions in actuarial cost model

1. Demographic mix of members
2. Enrollment Class (commercial, Medicare, Medicaid)
3. Geographical area
4. covered services
5. targeted reimbursement rate
6. payer's PMPM revenue (if contract is on a percent of premium basis)
7. experience of the hospital and services referred to outside hospitals
8. experience costs of the payer
9. competition
10. level of health care management
11. level of utilization management
12. patient cost sharing
13. coverage period / contract period
14. prior reimbursement levels

Solution 16 (continued)

(c)

Additional considerations for hospital.

- Potential to generate new business and preserve existing business (ie., grow market share)
- Relationship with physicians; willingness to understand capitation arrangement and work with utilization mgmt programs
- Align risk with incentives – physician incentive program
- Stop loss arrangement
- Cost of referrals to other hospitals
- Demographics of group
- Details of the contract
- Size of the MCO
- Ability to drive market share
- Product diversity & strategy of MCO
- Contract strategy of MCO
- Reputation of MCO
- Underwriting capability of MCO
- Reporting capability and systems requirements
- Business relationship
- Competitive environment

Solution 17

(a)

Calculate average % of Medicare-

PCP (Tables MC-5 and MC-7) $.95(1.2)+.05(1.5)=121.5\%$

SCP (Tables MC-5 and MC7) $.45(1.2)+.4(1.35)+.15(1.5)=130.5\%$

Develop Medicare Base (Table MC-5) $PCP=13.85/121.5\%=\$11.40$

$SCP=66.49/130.5\%=\$50.95$

Recognize Actual PMPMs (Tables MC-5, MC-7)

Medicare Base * Reimbursements * % of Utilization

E.g. PCP IPA 1 = $11.40 * 120\% * 95\% = \$13.00$

	IPA1	IPA2	IPA3
PCP	13.00	-	0.85
SCP	27.51	27.51	11.46
Total	40.51	27.51	12.31

Given Information (Table MC-8):

Physician IPA 1 = \$38.00

Physician IPA 2 = \$25.00

Physician IPA1 PCP Actual = Target

Physician IPA 1 SCP Target = $38.00 - 13.00 = \$25.00$

Adjust SCP Targets for Provider Change

IPA 1: $25.00 * (30\%/45\%) = \$16.67$

IPA 2: $25.00 * (55\%/40\%) = \$34.38$

IPA 1 Target = $13.00 + 16.67 = \$29.67$

IPA 2 Target = \$34.38

Solution 17 (continued)

(b)

Recognize Specialty Costs (SCP) are 10% too high = $27.51/25.00 = \$1.10$

Actual SCP Costs

IPA 1 = $16.67 * 1.1 = \$18.34$

IPA 2 = $34.38 * 1.1 = \$37.83$

Actual IPA Costs:

	IPA1	IPA2
PCP	13.00	-
SCP	18.34	37.83
Total	31.34	37.83

See Table MC-8 for Physician Risk Share Arrangements

IPA 1 Withhold = $31.34 * 10\% = \$3.13$

Net IPA 1 Payment = $31.34 - 3.13 = \$28.21$

Withhold Returned to Target PMPM; \$1.46 of withhold returned to IPA 1

Final Payment = $\$29.67$ pmpm

IPA 2: (Actual > Target => No Bonus) Final Payment = $\$37.83$

IPA 3: No Change; Final Payment = $11.86 + 0.85 = \$12.31$

Total Payment = $29.67 + 37.83 + 12.31 = \79.81

Solution 17 (continued)

(c)

Let x = revised Medicare pct of RBRVS for IPA 2

Solve for x such that the old average reimbursement = new average reimbursement after the shift of the specialty group from IPA 1 to IPA 2 (Tables MC-5 and MC-7):

Old Average = $.45 (1.20) + .40 (1.35) + .15 (1.50) = 1.305$

New Average = $1.305 = .30 (1.20) + .55 (x) + .15 (1.50)$

$\Rightarrow x = 1.309$ or need to lower IPA2 reimbursement to 130.9% of Medicare RBRVS

(d)

Advantages

- More predictable cost for MCO
- Cheaper for MCO to administer
- Guaranteed cash flow to the specialist group
- Reduces bad debt expense
- Capitating specialists and paying fee-for-service to PCPs can be advantageous

Disadvantages

- Potential to increase utilization
- Hard to determine which members to assign to specialist group
- Inability of specialist group to manage financial risk
- Need higher membership base in order to be credible (3 times or more)
- Need provisions to account for members who change doctors
- Need to consider carve-outs from the capitated arrangement

If paid as pct of premium, then specialty group is subject to the pricing/underwriting

- capabilities of the insurer

Solution 18

(a) (i) and (ii)

Annual Utilization / 1000 = 7,000 scripts (Table MC-4)

Develop number of formulary and non-formulary scripts for purpose of calculating rebates.

(see Tables MC-4 and MC-7)	No. of Scripts	Pct Formulary	No. of Formulary	No. of Non-formulary
Generic Scripts = .40 x 7,000	2,800	100%	2,800	0
Single Source Brand = .45 x 7,000	3,150	70%	2,205	945
Multi-Source Brand = .15 x 7,000	1,050	85%	893	158
Total	7,000			

	Generic	Single Source Formulary	Sngl Srce Non-Formulary	Multi-Srce Formulary	Multi-Srce Non-Formulary
Util. Per 1000	2,800	2,205	945	893	158
AWP	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00
Discounted AWP (MC-7)	\$20.00	\$72.00	\$72.00	\$48.00	\$48.00
- Copay	(\$10.00)	(\$20.00)	(\$40.00)	(\$20.00)	(\$40.00)
+ Dispensing Fee (MC-7)	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
+ Administrative Fee (MC-7)	\$0.50	\$0.50	\$0.50	\$0.50	\$0.50
= Cost / Rx without Rebates	\$12.50	\$54.50	\$34.50	\$30.50	\$10.50
- Rebates (MC-7)	(\$0.75)	(\$0.75)	\$0.00	(\$0.75)	\$0.00
= Cost / Rx with Rebates	\$11.75	\$53.75	\$34.50	\$29.75	\$10.50

Cost per script without rebates = Discounted AWP – Copay + Dispensing Fee + Admin Fee

Cost per script with rebates = Cost per script without rebates - Rebates

To develop total premium pmpm:

Solution 18 (continued)

<u>Description</u>	<u>Without Rebates</u>	<u>With Rebates</u>
Net cost exc. sales, marketing, profit	18.05	17.69
/1-(sales, marketing, profit=1-.11-.025)	/(1-.135)	/(1-.135)
=Total premium pmpm	20.87	20.45

Note: from Tbl MC-1, admin expense = 11%

Net Cost = Avg cost/script x (7 scripts per mbr per year) / (12 months)

Alternatively Net Cost = $(\sum \text{Cost/Rx} \times \text{Util}/1000)/12,000$

Without rebates, average cost / script = 30.95=weighted avg by scripts from above chart

With rebates, average cost / script = 30.32

Solution 18 (continued)

- (b) The purpose of rebates is for manufacturers to gain as large as possible market share for their product in pharmacy classes with many therapeutically equivalent drugs, while still have patent protection.

Rebates vary by actual market share and are therefore calculated long after drugs are dispensed. Consequently, patient cost sharing amounts will not reflect rebates.

There is a conflict of interest as PBMs may pursue highest rebate instead of lowest net cost. PBMs keep a portion of the rebate. Rebates can not be viewed in isolation as they are only one part of the puzzle. Higher rebates may be balanced by higher AWP's, etc.

To increase rebates:

- Formulary design eg, exclude from formulary drugs where bio-equivalents or therapeutic equivalents are available
- Benefit design – do not cover non-formulary drugs to drive higher formulary utilization

Solution 19

(a) Structural Criteria

- Ability to provide services
- Access to providers
- Includes Board Certification for physicians, credentialing, licensure of facilities, recordkeeping
- Easily documented physician network appointments

Process Criteria

- How care is provided (processes and procedures)
- Is there a link to outcomes?
- Examples: health screening rates, preventive care, office waiting times, number of out of network referrals

Outcome Criteria

- Reflects performance of whole system
- Examples: mortality rates, infection/complication rates, morbidity rates
- May not show reason on cause of poor outcome

Peer Review

- Compare provider's practice with peers or acceptable benchmarking
- Audits identify outliers as cases to be reviewed

Appropriateness Review

- Extent of providing appropriate, timely, and necessary level of care
- Identify over- and under- utilization areas

(b)

- Most states require Quality Assurance programs to be filed to receive licensure
- NAIC HMO Model Act: requires HMO to establish procedures to ensure services meet reasonable standards and requires internal programs to monitor and evaluate quality
- NAIC Quality Assessment & Improvement Act: requires HMOs to identify opportunities to improve care, measure performance of providers, conduct peer review, analyze utilization levels, and give input to providers on quality improvement process

Solution 19 (continued)

- NAIC Health Carrier Greivance Procedure Model Act and UR Review Model Act: 2 levels of review – (i) written review, (ii) hearings by health professionals with appropriate expertise
- NAIC Health Carrier External Review Model Act: when internal appeal process is exhausted, applies to denials based on medical necessity

(c)

Demand Management

- Activities designed to reduce utilization by members
- Includes cost sharing by members
- Also nurse advice lines, selfcare, medical informatics, etc.

Specialty/Referral Management

- Use PCP as gatekeeper
- Use of authorizations:
 - Single visit
 - Prohibit secondary referrals
- Review reasons for referral

Institutional Utilization Management

- Precertification
- Pre admission testing
- Same day surgery
- Mandatory outpatient surgery
- Concurrent review
- Maximum length of stay
- Rounding by UM nurse for discharge planning
- Retrospective review
 - Claims review – look for mistakes, fraud, upcoding
 - Pattern review – examine utilization pattern to determine where action is needed
- Alternatives to acute care hospitalizations such as SNF, hospice, home care, step-down units
- Case management -- used to manage high cost cases

Solution 19 (continued)

(d)

- Any willing provider laws – can't restrict network to physicians with best utilization patterns
- Direct access to specialty care – some SCPs may be used as PCPs with certain medical conditions
- Laws governing drug formularies – may require plans to cover non-formulary drugs if medically necessary. Most states provide exception to obtain non-formulary drugs
- Antitrust exemptions for physicians – allows physicians to jointly negotiate fees with MCOs which may significantly increase fees and utilization
- Defining UR as the practice of medicine – opens up MCOs to medical malpractice suits
- “prudent layperson” for emergency room use – expands coverage of ER use
- clinical mandates (LOS for maternity) – eliminates carriers ability to control length of stay
- mandated benefits (Mental Health Parity) – increases utilization

Solution 20

(a)

- 1) Guaranteed Issue Provision
 - a) Cover eligible individuals regardless of health status
 - b) Need price regulation so that carriers don't rate their way out of guaranteed issue
- 2) Guaranteed Renewability
 - a) Prohibited from discontinuing coverage for unhealthy individuals
 - b) Rate Controls to prevent carriers to rate based on expected future claim costs
- 3) Pre-existing condition limitation
 - a) Individuals with continuous coverage are exempt from Pre-ex exclusions
 - b) Allows individuals to move from job to job if they have continuous coverage
 - c) Doesn't guarantee identical coverage or coverage at all
- 4) High Risk Pools for uninsurables
- 5) Health Insurance Purchasing Cooperatives (HIPCs) / community rating
- 6) Standard Benefit Packages
 - a) Defines benefits so that policies can be compared
- 7) Mandated Benefits
 - a) Defines specific services to be covered and allows for rate comparisons
- 8) Community Rating to Reduce Rate Variation
 - a) Modified Community Rating with limited set of characteristics
 - b) Pure community rating leads to adverse selection

(b)

- 1) Prospective Risk Adjustment
 - a) Using diagnosis, drug data, demographic data, ACGs, etc. to assess carrier risk profile
 - b) Portion of community rating premiums will be transferred to other carriers based on risk profiles
 - c) Current Adjustment Methods are not great

Solution 20 (continued)

- 2) Retrospective Risk Adjustment
 - a) Plans pay into risk pool fund
 - b) Based on actual experience, funds are redistributed
 - c) May not provide right incentives to manage high cost cases
- 3) Blended Risk Adjustment
 - a) Combine both methods
 - b) Retrospective corrects for errors in prospective method

I recommend blended approach because it captures the best of both worlds. The retrospective component corrects for the errors in the prospective method

Solution 21

(a)

NAIC HORBC Model Act specifies:

- Regulatory action available to state insurance commissioner
- DOES NOT specify the risk-based capital formula
- Two calculations important: ACL = authorized control level; TAC = company specific total adjusted capital from statutory statement
- Calculate ratio: TAC / ACL ; ratio determines appropriate action

<u>Ratio</u>	<u>Action</u>
≥ 2.0	None
[1.5, 2)	Company action level
[1.0, 1.5)	Regulatory action level
[.7, 1.0)	Authorized control level
$< .7$	Mandatory control level

(b)

Risk-based capital measurements are used for:

- Financial assessment of insurance company (e.g., acquisition situation or shareholder assessment)
- Rating agency assessment of financial strength
- State regulators use to set minimum capital levels
- Blue Cross/Shield Association uses to set requirements for member plans
- Insurance companies use to allocate capital to product lines; assessment of financial performance

(c)

$$RBCAC = H_0 + (H_1^2 + H_2^2 + H_3^2 + H_4^2)^{1/2}$$

Where:

H_0 = Asset risk in affiliates

H_1 = Other asset risk

H_2 = Underwriting risk

H_3 = Credit risk

H_4 = General business risk

Solution 21 (continued)

(d)

Ways to reduce RBCAC:

- H_0 = reduce investment in affiliates subject to RBC
- H_1 = change asset mix to investments with lower RBC impact; divest common stock
- H_2 = improve claims loss ratio (increase premium/reduce claims), change mix of business to business with lower RBC factors (i.e., dental, ASO), use reinsurance, improve managed care RBC discount through more capitation, decrease receivable risk through letter of credit or withholds
- H_3 = no information in question – but can be improved through paying capitation directly to providers vs. through an intermediary
- H_4 = move more business into non-underwritten lines (ASO/ASC)