Solution #1

(a)

- Support management of assets/liabilities
- Productivity measurement
- Staffing level needed and task allocation
- Measures turnaround time (TAT)
- Measure work flow
- Identifies problems and strengths such as:
  - Insufficient training
  - Inadequate systems.

(b) Strengths:

- Provide information such as: monthly paid claims and unpaid, average days to process, exposure per month.
- All receipts are logged.

Weaknesses:

- No split by claims type
- Differentiate by electronic and paper claims
- No suspended/pended reports
- No information on claims transferred to another department
- No department reports which include all activity
- No claims status by date of receipt
- No paid claims report
- No individual count sheets – Daily
- No mail room status

(c) Intranet:

- Internal system based on Internet technology but blocked to external users.

Internet:

- System of reference and interactions available worldwide, user-friendly.
- Client – Groups – Employers:
  - Access to experience
  - Update of billing addresses, etc.
- Clients – Employees:
  - List of providers
  - Form to be downloaded
- Brokers/Agents:
  - On-line quotes
  - On-line underwriting
  - Access to product description

Solution #1 – Continued

Interactive Voice System/Voice Response Unit:
- System of automatic response by phone.

Optical Character Recognition:
- Technology that permits to read handwritten forms and convert it to match company's systems.

Electronic Funds Transfers:
- Avoid check manipulation
- Money is transferred directly.

Electronic data interchange.

E-Commerce Functions:
- Static: Information is provided only – user cannot enter own data.
- Interactive: Simple information can be keyed into system.
- Semi-integrated.
- Integrated.

Adopt e-commerce mindset:
- Commitment from management
- Everyone must be involved.

Accept that development will be continuous – be flexible.
Adopt rapid iterative design, develop and implementation approach (less than three months).
Have sound technical infrastructure.

Solution #2

(a) Financial Management Process includes the following:

1. Business Planning:
   - Process of determining company's key goals, objectives, and strategies to meet them.
   - Can use financial forecast model to test results of alternative plans/scenarios.
2. Implementation – Implementing activities to meet goals such as:
   - Rating changes (i.e., pricing, profit margins, claim trend assumptions)
   - Change in underwriting practices
   - Managed care initiatives
   - Provider contract initiatives
   - Marketing initiatives
   - Information systems improvement
   - Reduce administrative expense.
3. Reporting and Monitoring of Emerging Results:
   - Specific reports should be designed at a business-segment level to monitor results, comparing actual emerging experience to forecast assumptions.
   - Routine internal reports should be developed showing restated financial results.
4. Corrective Actions:
   - Forecasting process combined with an effective system for monitoring results provides a continual fine-tuning of business plan.
   - If the need for corrective action is identified early, modest "course corrections" may be sufficient.

(b) Ways to project claims PMPM:

- For managed care plan, the ideal way to project claims might be to apply specific provider contracting assumptions to a database containing information on each provider network.
- A simpler approach would be to apply assumed trends to base period claims values.
- While it is possible to project claims by type of service, the simplest and most manageable approach is to combine fee-for-service claims into a very small number of major categories for projection and trend application purposes; capitated components will be projected separately.
- One approach to projecting claims includes applying trends directly to the monthly value from the base period, in effect giving full credibility to the pattern in the base period data.
- Another approach to project claims involves starting with an average claims-per-member value for the timeline month base period, then projecting a progression of monthly values corresponding to trend changes, essentially ignoring the monthly variation in the base data.

Solution #2 -- Continued

- Claims can also be projected by projecting an average monthly value for each projection year, then applying factors to reflect seasonal variations as well as any one-time increases such as those reflecting provider contract changes.
- Treatment of changes in product mix should be handled in a manner consistent with projected income.
- Special analyses will often be required – to adequately reflect specific provider contracting provisions.
- Loss ratios can be used to project claims but is not generally a good vehicle for projecting incurred claims for most business segments because the implicit assumption is that claims levels will be consistent with the pricing assumptions.

(c) Estimation of January 2001 PMPM:

- Annual Trend Method:

$$\begin{aligned}\text{Claims } PMPM_{01/2001} &= \text{Claims } PMPM_{01/2000}(1+\text{Annual Trend}) \\ &= (54.52+45.81)(1+0.154) \\ &= 115.78\end{aligned}$$

- Monthly Trend Method:

$$\begin{aligned}\text{Claims } PMPM_{01/2001} &= \text{Claims } PMPM_{12/2000}(1+\text{Monthly Trend}) \\ &= (109.01+81.63)(1+0.012) \\ &= 192.93\end{aligned}$$

- Seasonal Trend Method:

$$\begin{aligned}\text{Claims } PMPM_{01/2001} &= (\text{Claims } PMPM_{2000})(1+\text{Annual Trend}) \\ &\quad \times (\text{Seasonality Factor}) \times (\text{Seasonality Normalization Factor})\end{aligned}$$

$$\text{Claims } PMPM_{2000} = \frac{(100.33 \times 945{,}000) + \ldots + (190.64 \times 979{,}000)}{945{,}000 + \ldots + 979{,}000}$$

$$\text{Claims } PMPM_{01/2001} = 118.57 \times 1.154 \times (\text{January Seasonality Factor}) \times 1.00$$

Solution #2 – Continued

- Loss Ratio Method:

$$\text{Claims } PMPM_{01/2001} = (\text{Proj. Premium Income } PMPM_{01/2001}) \times (\text{Loss Ratio})$$

$$\text{Projected Premium Income } PMPM_{01/2001} = \frac{165{,}000{,}000}{980{,}000} = 168.38$$

$$\text{Claims } PMPM_{01/2001} = 168.38 \times 0.78 = 131.34$$

(d) I would recommend the seasonal trend method due to the following reasons:

- In projecting claims, it will be necessary to develop a monthly claims pattern. Actual claims patterns typically exhibit some fluctuation from month to month, due in part to seasonal variation.
- Since the business segment is not largely capitated, the seasonality approach is recommended.
- Loss ratio is not generally recommended because the implicit assumption is that claim levels will be consistent with pricing assumptions.
- Do not use the monthly trend method because it ignores seasonal variations (unless only looking at quarterly results).

Solution #3

(a) Pooling methods:

- Catastrophic claim removal:
  - ASL or ISL
  - Remove large claims on an aggregate or individual basis.
  - Add pooling charge.
- Credibility weighting of manual claims and groups' own experience.
- Multiple-year averaging:
  - Combine multiple years of data.
  - Give greater weight to more recent experience.
  - Can't use for medical where you have high turnover or anywhere else experience rapidly gets out of date.
- Limits on loss ratio:
  - Same effect as aggregate stop loss and limiting % increase in rate.

(b) General: Usually credibility uses group sizes based on independent claims each year. Not necessarily true. Therefore, can understate credibility factor. This can underrate bad group or not credit good group enough.

Theoretical:

- If frequency is small, claims more volatile and increase greater, credibility is lower.
- If claim size varies greatly, will reduce credibility.
- Credibility assumes claims are independent year to year, may not be true. Be careful with life years.
- Group size → higher group size, higher credibility.
- Process variance → as it decreases, credibility increases.
- Variance of hypothetical mean → as it grows, credibility increases.

$$\frac{n}{n+k}$$

n = number of observations

k = $\frac{\text{expected value of process variance}}{\text{variance of hypothetical means}}$

Practical considerations:

- Competition's rates
- Effect on groups during transition to credibility rating
- Administrative costs
- Underwriting skills
- System capabilities
- Management philosophy.

Solution #3 – Continued

(c)

Manual Rate	Group 2	Group 3
Composite rate per employee	263	263
Trend	$(1.012)^1$	$(1.012)^2$
Age/Sex factor	1.05	1.10
Regional factor	1	0.9
Benefit plan factor	0.75	0.75
Net	209.60	199.99

Experience Rate	Group 2	Group 3
Claims < 50,000	186,000	567,000
Trend	$(1.009)^{12} \times (1.012)^7$	$(1.009)^{12} \times (1.012)^8$
No. of employees	100	300
Net PMPM	$\frac{186{,}000 \times (1.009)^{12} \times (1.012)^7}{100 \times 12} = 187.62$	$\frac{567{,}000 \times (1.009)^{12} \times (1.012)^7}{300 \times 12} = 192.94$
Pooling charges	$\frac{35}{(1.009)^{12} \times (1.012)^6} = 29.26$	$\frac{35}{(1.009)^{12} \times (1.012)^6 = 29.26}$
After pooling PMPM	216.88	222.20

Solution #3 – Continued

	Group 2	Group 3
Credibility to experience	25%	50%
Formula	$(0.25 \times 216.88) + (0.75 \times 209.6)$	$(0.5 \times 222.2) + (0.5 \times 199.9)$
Net PMPM	211.42	211.095
+ Admin. expenses	18	15
÷ (1 – commission – risk/profit load)	(1 – 0.08 – 0.05)	(1 – 0.06 – 0.04)
Gross PMPM	263.20	251.22

(d) Manual rates will be the same as calculated above.

Experience Rate	Group 2 (initial)	Group 2 (revised)
Total claims	207,000	216,000
Trend	$(1.009)^{12} \times (1.012)^{7}$	$(1.009)^{12} \times (1.012)^{7}$
No. of employees	100	120
Net PMPM	208.80	181.57

Using the multi-year approach and equal weighting, rate for Group 2 is:

$$(0.5 \times 208.8) + (0.5 \times 181.57) = 195.185$$

$$\text{Manual rate} = 209.60$$

$$\text{Credibility rating} = 0.25 \times 195.185 + 0.75 \times 209.6 = 206.00$$

$$+ \text{Admin. exp.} = 18$$

$$\div (1 - \text{comm.} - \text{risk / profit}) = 1 - 0.08 - 0.05$$

$$\text{Revised Gross PMPM} = 257.47$$

Solution #3 – Continued

Manual rate will be the same as in (c):

Experience Rate	Group 3 (initial)	Group 3 (revised)
Total claims	644,000	581,000
Trend	$(1.009)^{12} \times (1.012)^{8}$	$(1.009)^{12} \times (1.012)^{8}$
No. of employees	300	225
Net PMPM	219.14	235.02
Manual rate	199.99	199.99
Credibility to experience	50%	25%
Formula:	$(0.5 \times 219.19) + (0.5 \times 199.99)$	$(0.25 \times 23.502) + (0.75 \times 199.99)$
Net PMPM	209.565	208.25
+ Admin. expenses	15	18
÷ (1 – comm. – risk/profit)	$(1 - 0.06 - 0.04)$	$(1 - 0.08 - 0.10)$
Gross PMPM	249.52	260.63

Multi-year weighting $= 0.5 \times 249.52 + 0.5 \times 260.63$

Revised Gross PMPM = 255.075

Solution #3 – Continued

Underwriting considerations for group insurance:

- Minimum participation percent – need 75%
- Minimum enrollment
- Minimum group size
- Don't underwrite high risk groups
- Expected employees' contribution

- Eliminate self-employed groups
- Eligibility – Actively at work
- Financial viability of group
  - Payroll deduction ability
  - Part-time service limits – part timers at least 20-30 hours/week
  - Benefit plan richness
  - Family business? Insurance just for the sake of family?
  - Prior history of group – other insurers?
  - Rate guarantees
  - Rate tiers
  - Average age limits – usually under 45
  - Sex mix – Limit to 75% female.

Solution #4

(a)

- Case Reserves or Direct Enumeration, also known as Examiner's Method = Claim Examiner's best guess or estimate of ultimate claim amounts. Most often done for catastrophic or litigated claims. Still need IBNR estimate.
- Average-Size Claim Method = average claim amount times number of reported claims. Not a good method if much variance.
- Projection Method = average claim PMPM × exposure base or number of members – paid claims. Used if unreliable data or lack of data, say when volume is insufficient for other types of analysis. Good reasonableness check of other methods.
- Loss Ratio Method = Estimate a projected loss ratio and multiple by earned premium. Subtract know paid claims. For new block of business without credible history.
- Tabular Method = Apply a continuance table to estimate duration of claims. Useful for Disability and LTC claims. Can only be applied to reported claims. Additional estimates needed for ICOS and IBNR.
- Development Methods = Develop claims triangle of paid claims by incurral month and by paid month. Must be able to record an incurred (service) date and payment date for each claim. Assume historical lag pattern, possibly with adjustments, accurately represents incurred claims that have not been paid. Suitable for most medical coverages.

Solution #4 – Continued

(b)

	1/98 Runout	Ultimate Based on 1/98	Completion Factor
Jan. '98	4,300	45,500	9.45% accumulated paid claims for 1/98
Feb. '98	24,100	45,500	52.97% (line 1, 1/98, Table MM-4a, in 1000s)
March '98	34,900	45,500	76.70%

Oct. 2000 paid as of 12/00	49,300,000	Accumulated paid claims as of 12/00
Nov. 2000 paid as of 12/00	39,200,000	(last column Table MM-4b, in 1000s)
Dec. 2000 paid as of 12/00	8,100,000	
	96,600,000	

	Ultimate Claims
49,300,000 ÷ 0.767 =	64,276,402 (Oct. 00)
392,000,000 ÷ 0.5297 =	74,004,153 (Nov. 00)
8,100,000 ÷ 0.0945 =	85,714,286 (Dec. 00)
	223,994,841

Oct. 2000 unpaid balance as of 12/00 = 14,976,402 (64,276,402 – 49,300,000)
Nov. 2000 unpaid balance as of 12/00 = 34,804,153 (74,004,153 – 39,200,000)
Dec. 2000 unpaid balance as of 12/00 = 77,614,286 (85,714,286 – 8,100,000)
127,394,841 Outstanding liability as 12/31/00

Solution #4 – Continued

(c)

	Based on 1/98 Runout
Apr. 1998	40,200
May 1998	42,000
June 1998	43,200

	1/98 Runout	Ultimate Based on 1/98	Completion Factor
Accumulated	40,200	45,500	88.35% after 4 months
Paid claims for 1/98	42,000	45,500	92.31% after 5 months
(Table MM-4a, in 1000s)	43,200	45,500	94.95% after 6 months

	Ultimate Claims (from part b)	% Paid by 3/31/01	Paid Amount As of 3/31/01	
Oct. 2000	64,276,402	94.95%	61,030,444	
Nov. 2000	74,004,153	92.31%	68,313,234	
Dec. 2000	85,714,286	88.35%	75,728,572	
	223,994,841		205,072,249	Amt. paid by 3/31/01

223,994,841 – 205,072,249 = 18,922,592 outstanding liability as of 3/31/01.

Outstanding liability as of 12/31/00 = 127,394,841 (from part b)

Portion of above outstanding liability expected to be paid by 3/31/01:
127,394,841 – 18,922,592 = **108,472,249** or **85.1%**

Solution #5

(a) Trend change in costs from one time period to the next.

Trend uses:

- Rating
- IBNR
- Provider contracting
- Competitive position
- Managed-care initiatives
- Projecting costs into future.

Components:

- Provider reimbursement trend – usually largest component. Δ in reimbursement to provider for a service. Measure by analyzing provider contracts.
- Residual trend
  - Utilization trend – change in frequency of use of service.
  - Fluctuation – large claims, epidemics
  - Intensity Δ
  - Technology Δ
  - Demographic Δ
  - Product mix Δ
  - Code creep
  - Cost shifting
  - Government intervention
  - Deductible leveraging.

(b) Problems:

- Insufficient resources – data, models, people
- Lack of detailed data.
- Effect of claim payment pattern Δs.
- Competition – may not be able to unilaterally Δ rate trend as desired.
- Loss ratio incorporates effect of many premium distortions (e.g., inaccurate managed-care pricing, retrospective premiums)
- Antiselection
- Random fluctuation – catastrophic claims, epidemics.
- Cost increase spiral.
- High-variance cases cancel after high-cost year. Future low years are forgone.
- Anomalies due to change in data systems and products.
- Method used to analyze must balance short-term vs. long-term (Short-term – get most recent data; long-term – more statistically credible)
- Pulse outliers (temporary) and know cause.

Solution #5 -- Continued

- Risk shifting
- Cost shifting
- Data integrity
- Managed-care initiatives.

Techniques to analyze:

- Historical averages/graphs.
  - Highly aggregated data
  - Use judgment, competitive analysis, historical analysis to set trend levels.
  - Recent trends highly influences choice of assumptions
  - Root cause of cyclical nature.
- Actuarial models:
  - Detailed build-up of cost components.
  - Consider "known" impacts and reasonable assumptions.
  - Recent experience heavily influences choice of assumptions.
  - "Known" impacts may not be as accurate as hoped.
- Linear regression – tantamount to using historical average.
- ARIMA models:
  - Fit past experience and extrapolate.
  - Does not deal well w/seasonality.
  - Accurate only for short time.
- External indicators:
  - Statistical
  - Leading indicators.

(c) Total trend = 1.12

Average deductible =				
	100	2,500	250,000	
	250	3,400	850,000	
	500	1,525	767,500	
		7,425	1,862,506	250.84

Deductible leveraging:

$$\text{Manual claim cost} = 263 \times 12 = 3{,}156 - 250.85 = 2905.16$$
$$\times 1.12 = 3253.78 + 250.84 = 3504.62$$

$$\Delta = \frac{3504.62}{3156} = 1.11$$

$$\text{Deductible leveraging} = \left(\frac{1.12}{1.11}\right) = 1.009 - 1 = 0.9\%$$

Solution #6

(a) Part (i):

Ranges of appropriate levels of surplus vary greatly as opposed to other types of insurance products.

The appropriate level of surplus will vary based on:

- Quality of management
- Other products offered
- Regulatory environment.

RBC is most commonly used to determine surplus. External benchmarks are available to determine RBC for various purposes such as statutory filings and rating agency requirements.

RBC is designed to provide a reasonable margin of safety for insurance operations.

A limitation of RBC is that it does not account for vitality surplus – the extra capital needed to undertake corporate initiatives such as starting a new product line. Vitality surplus can also mean increased C4 margins.

Rating agencies may require additional levels of surplus before they will give an insurer a specific rating.

Insurance companies also wish to avoid being taken over by regulators. In order to assure this, they often keep RBC at 200% of the NAIC level.

After developing a preliminary RBC formula for management purposes, the entire product should then be priced in order to meet the company's required return on capital. If the price determined for a product is too high to be competitive, it indicates one or both of the following:

- The product is not competitive and should be removed from the market
- The RBC formula is too conservative and should be reformulated.

Part (ii):

ASO – This will require generally low levels of required surplus because the firm is assuming little or no risk for the coverage.

Major Medical – Fortunately, the riskiest product, traditionally indemnity, is only 5% of the business. The required level of surplus for the PPO business will be less than the indemnity business, but significantly higher than the ASO and managed-care lines.

Solution #6 –Continued

Group Life and Disability – Greater surplus than other types of insurance.

Managed-Care:

- New level of complexity into the financial management process.
- The type of MCO is not sufficient to determine as appropriate level of RBC, risk characteristics vary greatly.
- Revenue is generally capitated, expenses vary.
- Thorough analysis of claims structure is required.
- Risk characteristics of the business can be adjusted to improve situation.
- New guidelines for MCO may require increased required surplus.

(b) The close relationship between profit and growth is partly a result of acquisition and valuation strain. It is a function of the inverse relationship between rapid growth and large profit margins.

One approach to address the relationship between profit, growth, and required surplus is to establish the required level of surplus as a percentage of premium.

In order to be self-supporting, a line of business must generate enough surplus to fund its own risk fluctuation reserve or RBC.

Stock companies must also generate sufficient profits to provide investors with their required stream of dividend payouts.

Several factors affect the size of the required level or surplus:

- Size of company
- Other product lines written
- Underwriting philosophy
- Product mix
- Contingency margins or explicit profit margins in rates.

Interaction of the following factors need to be considered when determining the level of profit needed to fund the required surplus:

- Growth rate
- Operating gain as a percentage of premium
- Long-term surplus requirements.

Alternative way to approach the relationship is for upper-level management to determine what it considers to be an appropriate level of return on equity or capital for each line of business, based on the line's risk characteristics.

Must apply rate to the true level of capital or surplus as opposed to the historically accumulated level.

Solution #6 -- Continued

The desired rate or return for investors must also be considered.

In a growing business line, profits must be sufficient to cover the increases in required surplus or risk fluctuation reserves.

Solution #7

(a) Challenges of using data:

- Consistency of data – Need the most consistent data to compare results over various time periods. Inconsistent data can lead to wrong conclusions. Consistency and reasonableness of the data is the responsibility of the actuary. Accuracy and comprehensiveness is the responsibility of the data preparer.
- Availability of data – Can you get the data you require? Source of data – electronic (faster) or manual (more costly). You may need the data quickly. Can systems operate fast?
- Reliability of data – Must check validity of data. Check data against itself. Actuary responsible for reasonableness/consistency. Data preparer responsible for accuracy/comprehensiveness. If data not reliable, determine effect/bias on results and disclose.
- Value of data – Can meaningful decisions be made from the data and subsequent analysis?
- Extract from data – How the data is presented depends on the audience. The amount of time available for assessment also may impact how data is extracted.

Actuarial Standards of Practice #23 – Data Quality:

- Selection of data:
  - Consider intended use of data.
  - Intended use dictates nature and extent of review needed.
  - Data should be reasonable and comprehensive with attention to internal and external consistency.
- Availability of data:
  - What alternatives are available?
  - Cost and time frames reasonable?
  - Actuaries should disclose source of data.
  - What sampling methods used to collect data?
- Reliability of data:
  - Is data appropriate for purpose and is it current enough?
  - Data preparer responsible for accuracy/comprehensiveness.
  - If you can review data, do it. Otherwise state that you can't and not limitations.
  - Accuracy and comprehensiveness is responsibility of those who supply data. However, actuary should review for reasonableness and consistency when practical.
  - Use of imperfect data (incomplete, inaccurate) result in material bias.
  - Disclose extent to which imperfect data produces material bias to work.
  - Document adjustments/modifications made because of imperfections.
- Value of data:
  - Disclose materiality of any potential bias due to imperfect data.
  - If you still have concerns, note them in the report.
  - If you departed from any procedure in the Standards of Practice materially, be prepared to justify.

Solution #7 – Continued

(b) Part (i):

Comparability of data is the most important thing when developing HP performance measurement criteria:

- Review data for accuracy, consistency, reliability, comprehensiveness.
- Determine number of unusable records.
- Periodically audit/review data.
- Data retain value if moved.
- Determine time period.
- Is it from an appropriate source?

Source of HP performance data:

- Claims system data:
  - Usually electronic
  - Readily available
  - Cheap to access
  - Limitation is the accuracy and completeness of coding by providers and claims examiners.
- Medical records (patient records):
  - More accurate
  - Costly to use
  - Doesn't capture services provided by another provider.
- Patient-reported data:
  - Only source for some of more cognitive items
  - Usually done by survey
  - Form of survey can influence outcome
  - Reliability subject to interpretation.
- Population exposure data:
  - Usually provided by employer.
  - Not always optimal.

Part (ii):

Measurement Process:

- Use defined standards and definitions.
- Ensure quality of data (see above).
- Use statistically credible sample.
  - Stratified or random
  - Results affected by turnover of providers, number of providers, size of group.
- Make sure population is relevant – Don't ask 18-year-old male about maternity.
- Disclose and make available your methods.

Solution #7 -- Continued

- Provide an interpretation:
  - Sources of data
  - Credibility
  - Interpretation of results
  - Comparative data (socio-economic)
- Areas to compare?
  - Opportunity to receive treatment
  - Number of providers
  - Access to specialty
    - Cost/financial
      - Adjust for age/benefits
      - 3-year trend
      - National trend
  - Member satisfaction
      - Out-of-network use
      - Waiting time
      - Grievance
      - Complaints
  - Medical effectiveness
      - Proxy indicators
      - Outcomes
      - Compliance with protocols
      - Cost-management data
      - Preventive practices.

Solution #8

(a) External sources – must understand:

- Characteristics of population that would affect mortality and morbidity
- Time period
- Limitations of collection mechanism
- Appropriateness of the data for the task.

Example of sources:

- Federal government publications (e.g., Medicaid, CPI, etc.)
- Actuarial publications (e.g., SOA reports and tables)
- Reinsurer, consultants, state.

Internal sources – very important source of information.

Example of sources:

- Claim paying system data
- Premium billing system
- Commission payment system.

(b) Assumptions:

- Morbidity
- Mortality
- Interest (since long-term)
- Lapses (function of marketing, distribution, price)
- Expenses
- Taxes
- Future trends in LTC costs.

Standards of Practice:

- Reflect the actuary's best judgment of future events.
- Have to consider available data and expected future changes.
- Should incorporate appropriate provisions for adverse deviations.
- Should be reasonable (not unduly optimistic nor pessimistic)
- Should be consistent with each other.

+ → sensitivity analysis should be made. Also cash-flow testing.

Solution #8 – Continued

(c) Part (i):

Claims Reserves:

- Due and unpaid liabilities – Claims reported and processed but payment not recorded.
- In course of settlement – Claims reported but not yet adjudicated and paid.
- Incurred but not reported – Claims anticipated but not reported.
- Loss adjustment expense – Cost associated with adjudication of unpaid claims.
- Present value of amount not yet due – Incurred before valuation date but not accrued yet.
- Resisted claims – (Known litigation situation exists)
- Outstanding accounting feeds.

Active Life Reserves:

- Unearned premium reserves – Portion of premiums covering a period of time beyond valuation date.

Contract Reserves:

- Portion of premium covering claims costs > ret. premium later.

Premium Deficiency Reserves.

Part (ii):

Methods:

- Case reserves – Estimate ultimate claims – Amount already paid.
- Projection method – Develops historical claims rate.
- Loss-ratio method – Develops based on historical ratios of incurred claims to earned premiums.
- Tabular method:
  - Uses continuance table.
  - Interest discounting
  - Develops PVANYD.
- Development method.

Solution #9

(a) Measures Related to Growth:

- Premium equivalents:
  - Should be adjusted for trend
  - Inflation could mask a declining book of business.
  - Risk-based adjustments
  - Convert into premium equivalent that would be generated if customer purchased traditional, fully-insured indemnity insurance.
- New cases sold
- Number of group contracts
- Number of employees and dependents covered
- Commissions
- Investment income.

(b) Measures Related to Profit:

- Statutory vs. GAAP measures
- Using profit as a percent of premium is a good idea. It adjusts for growth.
- Underwriting gain vs. operating gain
  - Underwriting gain does not include net investment income.
  - Operating gain includes net investment income.
- Return on equity: $\frac{\text{GAAP Profits}}{\text{GAAP Capital and Surplus}}$
- Economic Value Added:
  - Better measure than ROE measure. Opportunities may be passed up if ROE is used even though value could be added.
  - Defined as the excess profit from a business over and above its cost of capital.
- Loss Ratios:
  - May be distorted by reserve adjustments, seasonality, and cyclicality.
    - Seasonality issue – Use 12-month rolling loss ratios.
    - Cyclicality issue – Try to get the whole cycle period in the loss ratio calculation.
- Service Businesses – Calculate profit per employee.

Solution #9 – Continued

(c) $$ROE = \frac{\text{Profit}}{\text{Surplus + Capital}} = \frac{\text{Profit}}{20\% \text{ of Premium}} = 18\%$$

Profit = 0.20 × 0.18 × premium = 3.6% of premium.

∴ operating gain = 3.6% of premium.

Investment Income = 0.30 premium × 5% = 1.5% of premium.

Underwriting gain (after-tax) = 3.6% of premium – 1.5% of premium
= 2.1% of premium

$$\therefore \text{Pre-tax underwriting gain} = \frac{2.1\%}{0.63\%} = 3.33\% \text{ of premium.}$$

Solution #10

(a) Basic information requirements necessary for the proper handling of health claims:

- Information to identify the policyholder and the claimant:
  - Entity contracting
  - Individual insured
  - Dependent relationship
  - Eligibility of claimant.
- Proof of loss – According to contract.
- Date of loss – Whether the contract was in-force.
- Amount of loss – Eligible charge based on the contract.
- Information on to whom the payment should be made:
  - Beneficiary
  - Assignee.

(b) Health claim adjudication process:

- Benefit eligibility and proof of loss:
  - Contract provisions.
  - Exclusions, limitations, pre-existing conditions.
  - Collect bills from hospital and doctors
  - Date of accident or illness.
- Determine eligible charges – Scheduled or usual, customary and reasonable.
- Determine gross benefit level
  - Apply deductible, co-payment, and out-of-pocket
  - Apply policy maximums.
- Determine net benefit level
  - Coordinate with other coverage
  - Primary or secondary payer.

Solution #11

(a) Smith Corp. should consider the following:

- Reimburse on a least expensive alternate treatment (LEAT) basis only.
- Create an extensive set of age/time limitations to guide care.
- Exclude cosmetic/experimental care.
- Waive deductible for preventive (overall dental health will be improved)
- Lower coinsurance for orthodontia.
- Add a separate deductible for orthodontia.
- Set annual maximum of $1,000.
- Raise the deductible to something substantially higher.
- Raise family deductible from 2X to 3X.

(b) Plan design characteristics to limit anti-selection include:

- Limits on frequency of choice.
- Limits on degree of change (e.g., can only move one tier at a time).
- Modify current dental plan and add one or two coverage options but limit spread among options.
- Require proof of insurability.
- Delay full payment (i.e., full coverage for cavities after one-year wait).
- Maintain a parallel plan design (e.g., the same lifetime max/ortho max should be used for all).
- Package with other plans (i.e., include a low-cost dental with low-cost medical and a high-cost dental with a high-cost medical)
- Test plan assumptions with a test group of employees.
- Changing coordination of benefits provision to exclusion or carve-out method.
- Add waiting/deferral periods for new/late enrollments (non-contributory plan).
- Add waiting period for certain procedures.
- Exclude pre-existing conditions (i.e., missing tooth).
- Limiting extension of benefits provision.
- Add a managed-care option (fixes payment levels for various expenses and encourages preventive care).
- Fix employer contribution and vary employee contributions (will allow opting-out while still maintaining minimum participation level).
- Eliminate dental coverage altogether (i.e., offer a health-care expense account for dental expenses).
- Consideration of rules for transferred business.
- Create a list of eligible industries.
- Create a definition for eligible individual (e.g., don't cover dependents if they are covered by spouse's plan).

Solution #12

(a) Business Objectives:

- Growth -- How will that affect reinsurer?
- Simple vs. complex goals
- Reasonable and consistent goals
- Clearly defined goals
- Market conditions
- Target markets

Administration:

- Are procedures followed?
- Are restatements active and followed?
- Reporting frequency.

Management:

- Competent
- Appetite for risk
- Attitude

Objectives of Reinsurance Program:

- Maximum profits? Minimum volatility? Maximum stability? Access to services?
- Tailor program and objectives.

Financial Condition:

- Rating agencies
- Financially capable of meeting objectives
- Where would additional financing come from?

Underwriting:

- Who will do?
- Skill level
- Authority level.

Claim Adjudication:

- Claim-paying philosophy
- Authority level of examiners
- Workload, compared to industry norms.

Marketing and Sales:

- Training
- Target market
- Market segments

Solution # 12 -- Continued

Expected Profits to Reinsurers:

- Adequate premium
- Appropriate spread of risk

(b) LTC Challenges:

- Young product – benefits continually expanding.
- Low frequency, high severity
- Claim-cost curve is steep. Decades for experience to emerge.
- Future direction of claim costs is debatable. Medical advances could extend treatment. Cures could reduce costs.
- Insured claim cost data is scarce. Most pricing based on population data.
- Capital intensive:
  - RBC requirements onerous
  - Substantial reserves
  - Small employers may have trouble competing.
- New financing approaches
- Homogeneous data difficult to get. Variances in underwriting, marketing, distribution, claim administration
- Reinsurer expertise is limited
- Specialized nature
- Low participation can lead to antiselection.
- Small market – Small employers' pricing is questionable. Large employers' have not pursued reinsurance since small percentage of premium dollar.
- Changing consumer behavior:
  - New services and expanded availability of existing services.
  - Changing family structure
  - Changing attitude towards nursing homes
  - Easing regulation of beds
  - Medical advances – could increase or decrease costs
- Need accurate assumptions – lapse, expense, interest.

Solution #12 -- Continued

DI Risks:

- Low frequency, high severity
- Handling of offsets (e.g., WC, SS) – usually kept by insurer
- Basis upon which to price
  - Reinsurer favors individual calculation (more complicated, costly).
  - Insurer favors percentage of premiums (easier, beware of deductible leveraging).
- Potential antiselection
- Potential abuse – particularly during downturns in economy
- Attachment point estimation
- Capital intensive
- Need substantial reserve
- Accurate assumptions – lapse, expense, interest.

Medical Risk:

- Attachment point estimation
- Misestimate trend
- Antiselection
- Rate increase spiral
- Need accurate and excellent pricing, underwriting, claim adjudication
- Misestimate expenses.

(c) Programs:

- DI – Automatic Excess:
  - Retain first x of monthly benefit, reinsure excess.
  - "Follow fortunes" of insurer.
  - Can charge premium to reflect risk.
  - Protects insured from catastrophic claims.
- LTC – Proportional reinsurance:
  - Receive x% of premium and pay y% of claims, x not equal to y, usually.
  - Can set x and y so as to meet needs of customer and profit.
- Medical:
  - Individual stop-loss – Limits exposure on each individual life
  - Aggregate stop-loss – Limits exposure on aggregate.

  } Use both

    - Beware of deductible leveraging.
    - Attachment point set at expected plus margin.
    - Could only cover 70% -- insurer retains cost control incentive.
    - Need to accurately project expected.
    - Can adjust attachment points to meet customer needs

Solution #13

(a) Major drivers of consumerism in the health-care industry:

- Growth of Consumerism in Society:
  - Aging workforce
  - More educated
  - Increased wealth
  - Greater demand for more convenient goods and services.
- Employers:
  - Shift to defined-contribution plans
  - Force employees to become more involved in health care
- Government Initiatives:
  - HIPPA
- Media and Public Perception
- Information Technology – Internet
- Private accreditation and advocacy groups – enables consumer to distinguish plans based on quality.
- Social trends – value on self-reliance.

(b) Current managed care trends that might contribute to the cost increase:

- Restructuring – Physicians regrouping, abandoning solo practice. Direct contracting by employer has challenged the existing system.
- Competition – Growing number of for-profit health plans.
- Cost increases – Cost shifting strategies have run their course.
- Quality – Trend toward real quality of care.
- Reduction in available capital for health-care plans.
- Aging – The graying of America.
- The effect of the Internet on business.

(c) Approaches the employer could use to mitigate this rate increase:

- Provider community:
  - Report cards at provider level
  - Review quality assessment
  - Consider alternative medicines
  - Direct contracting
  - Employer clinics
  - Telemedicine
  - Case management
  - Centers of excellence
  - Risk-sharing arrangements.

Solution #13 – Continued

- Health plan:
  - Report cards
  - Case management
  - Risk-sharing
- Employees:
  - Increase cost-sharing
  - Total health management
  - Choice of competing options
  - Health risk assessments

Solution #14. MC Extension

Part (a) 1. Expected 2001 HMO and POS hospital inpatient costs

	HMO	POS	Combined
Baseline Experience			
Clm Experience in 2000 (Tbl MC-3)	33,600,000	62,200,000	
Average Monthly Members (Tbl MC-6)	80,000	130,000	
Months per year	12	12	
pmpm - year 2000 (Clms / Mbrs / 12)	$35.00	$39.87	
Solution Method 1			
Trend in Hospital charges (i.e., cost trend)			10%
Trend in Utilization			
- 2000 days per 1,000 (Tbl MC-4)			318
- 2001 days per 1,000 (Tbl MC-3)			290
- Utilization adjustment (=2001 / 2000 days/1000 = 290 / 318)			91.2%
- Utilization trend (= .921 – 1)			-8.8%
Net Trend Factor (=1.1 x .912)			1.00314
Pmpm - year 2001	$35.11	$40.00	
(=2000 pmpm I/P claim cost x charge trend x utilization trend)			
Solution Method 2			
2000 Inpatient days per member per year	0.318	0.318	(Tbl MC-4)
Average charge per day - year 2000	$1,320.75	$1,504.60	(from Tbl MC-3)
Trend in hospital services	10%	10%	
Average charge per day - year 2001	$1,452.83	$1,655.06	
Inpatient days per member per year	0.290	0.290	(Tbl MC-4)
Months per year	12	12	
Pmpm (= avg chg/day x I/P days/yr / 12)	$35.11	$40.00	

Part (a) 2. Determine total required premium (pmpm)

	HMO	POS
Claims pmpm (given in problem)	$170.00	$185.00
Administrative Expenses - Fixed (Table MC-6)		
Annual expenses - year 2000	$16,000,000	$26,000,000
Average monthly members	80,000	130,000
Trend = 4% (to 2001)	1.04	1.04
Months per year	12	12
Pmpm	$17.33	$17.33
Formula = (annual expense) x (1 + trend) / (member months) / 12		

Administrative Expenses - Percent of Premium (Table MC-6)		
Average commissions	2.50%	2.50%
Premium tax	0.25%	1.00%
Margin & contingency	1.50%	1.50%
Subtotal	4.25%	5.00%
Total Premium	$195.65	$212.98
Formula = (Claims + Fixed Expense) / (1 – % expenses)		

Part (b) 1. Calculate manual premium rates by tier using HMO rate relativities

	Single	2 Party	Family	Composite
Composite Premium Rate (from above)				$195.65
Calculate HMO Manual Premium Rates				
Calculate Weighted Average Contract Size				
Distribution	35%	15%	50%	
Contract Size	1.00	2.00	3.80	2.55
Calculate Weighted Average HMO Premium Relativity				
Premium Weight - HMO Relativities	1.00	1.90	3.50	2.385
Calculate HMO Conversion Factor = 2.55/2.385				1.069
Manual Monthly HMO Premium Rates	$209.18 (=195.65 × 1.069)	$397.45 (=209.18 × 1.9)	$732.14 (=209.18 × 3.5)	

Part (b) 2. Calculate manual premium rates by tier using POS rate relativities

	Single	2 Party	Family	Composite
Calculate Weighted Average HMO Premium Relativity				
Premium Weight - POS Relativities	1.00	1.70	4.20	2.705
Calculate POS Conversion Factor = 2.55/2.705				0.943
Manual Monthly HMO Premium Rates With POS Relativities	$184.44 (=195.65 × 0.943)	$313.54 (=184.44 × 1.7)	$774.64 (=184.44 × 4.2)	

Reasons for/against mirroring POS rating slope

- More competitive single, two party rates
- Less competitive family rates (which could raise overall average age)
- Potential for antiselection if different slopes (relative rates by tier) are used
- Aligning relative rates by tier with expected costs is preferred to avoid adverse selection
- Using consistent slopes will reduce potential selection bias between products

Part (b) 3. Documentation to include in files to demonstrate that Actuarial Standards of Practice concerning HMOs or other managed care health plans were followed

According to Actuarial Standard of Practice No. 16, the following items should be included:

Transfer of Financial Risk to Providers - Impact on rates

- Capitation included in rating (none for Bedford Group)
- Stop loss considered (none for Bedford Group)
- Capitation versus reasonable projected claim costs (none for Bedford Group)
- Provisions - potentially insolvent risk takers - Bedford reviews financials
- Financial incentives to providers - are they reported in Bedford's financial results
- Settlements treated as assets - are they reported in Bedford's financial results
- Experience rating, consider settlements and claims under capitation (none for Bedford Group)

Management of Health Care Delivery Systems - Impact on rates

- The management of delivery of care affects the process used to set claim liability estimates. The actuary should account for changes in the delivery system such as changes in provider reimbursement, changes in provider network, effectiveness of utilization review, capitation arrangements, or use of non-plan providers.
- The actuary should comment on ability to achieve utilization targets impacted by changes in the delivery system.
- Data monitoring for an HMO organization requires provider contracting data in more detail than an unmanaged organization to estimate the impact of changes in the delivery system.
- Basis for claim reports should include whether claims are gross or net of such items as provider withholds, COB, reinsurance, provider stop loss, and provider discounts.

Multiple delivery systems and financial structure

- Consider different financing mechanisms such as capitation, staff model, a fee-for-service, or a combination of these arrangements.
- Consider scope of services by contract type – when data ambiguities exist, the actuary should ensure that assumptions made are reasonable and any data limitations are noted and accounted for.
- Consider change in membership mix – the actuary should consider membership shifts from experience to projection periods between various health care delivery and reimbursement structures where different costs exist. The impact on medical cost trend should also be considered.

Part (c) Potential impact of adverse selection from the following types of market reform

Insurer Rules of Issue

Insurers can refuse health coverage based on past health history or general indicators of health status. Insurers in most states are allowed to refuse renewing policies based on previous claim experience and deny for pre-existing condition. Not allowing these practices would create adverse selection for insurers since there would be no incentive for individuals to insure themselves until they became seriously ill or expect to have high future medical bills. Can change rules of limit while protecting against adverse selection by:

- Limiting guarantee issue period to open enrollment period
- Setting maximum time spans for pre-existing condition exclusions
- Applying guarantee issue/renewability on all products in a given market

Government Mandated Benefits and Laws

Effect of standard benefit packages on adverse selection depends on the package of reforms that are implemented. Mandated benefits have the potential for reducing selection for similar standard benefit plans and increasing premium. This may lead companies to self-insure which will segment the risk. Medical savings accounts and catastrophic health insurance

policies would increase risk segmentation and possibly adverse selection Laws that could moderate adverse selection include:

- Anti-managed care laws
- Any willing provider
- Freedom of choice laws

Rating Methodologies

- Community rating may result in adverse selection if young and healthier risks opt out of the population instead of subsidizing higher cost risks. Moderate age bands and industry rates may decrease adverse selection in areas where community rating is used.
- Allowing MEWA exceptions could lead to adverse selection by allowing groups with better risks to band together to purchase experience rated insurance leaving poorer risks in the community rated block. Adverse selection due to MEWA exceptions could be eased if these plans are limited or by developing a risk-adjustment mechanism to redistribute costs from the community rated pool to those opting out of the pool.
- Risk adjustments are designed to reduce incentives for risk selection. Retrospective methods like pooling and prospective methods like age/sex factors may reduce adverse selection (best if used in combination).

Marketing Practices

Agents/brokers who are incented to target neighborhoods to select favorable risks may have impact on adverse selection. Standard benefit package and guarantee issue underwriting reduce effects of adverse selection. Without guarantee issue, market conduct examiners are limited to preventing false and misleading statements.

Solution # 15. MC Extension

Part A. Differences between BH/CD and Radiology services regarding how access to care is obtained and utilization is controlled

Access to Care

BH/CD

- EAP program - no medical background but always there and intervene early
- PCP - treat and diagnose some of the easier problems
- Behavioral health case manager

Radiology

- Always need a referral to obtain these services

Utilizatin control

BH/CD

- Case manager
  - promote correct diagnosis and treatment
  - prevent recidivism
  - promote efficient use of resources

Radiology

- Don't allow physician to use his own equipment - will encourage overuse
- Contract with a lab to do the services and always require that services be obtained there
- Put a copay/coinsurance on radiology services
- Provider feedback and education

Part B. Mechanisms The Bedford Group can use to reduce provider reimbursement costs

BH/CD

- Coverage limit on days, visits or admits
- Alternative forms of treatment: partial hospitalization, outpatient treatments for substance abuse
- Goal directed psychotherapy
- Crisis intervention

Radiology

- Negotiate with limited network = more leverage
- Reimburse at lower margin for in office equipment

Part C. Issues to consider in determining whether carve-out is preferable to carve-in strategies

Carve-out Strategies

- Works where separate admin stregthens accountability, lowers cost, improves access to care
- Economies of scale allow BH companies to manage overall costs and quality
- Budgets are more predictable
- Avoid paying twice: capitation and out-of-network

Carve-in Strategies

- Useful in controlling inappropriate utilization and promoting integrated care
- Link behavioral issues to medical costs, use BH issues to offset medical costs
- Perform a cost benefit analysis to determine if advantageous

Part D. Capitation rate for physician radiology services

Services per 1000 members in 2000 = 1,200 Table MC-4
Budgeted services per 1000 members in 2001 = 1,000 Table MC-4
Pmpm cost = $8.50 Table MC-5
25% increase in price with budgeted decrease in 2001 of 1000 services/1000 members
The cap rate would be = $8.50 x 1.25 x 1000/1200 = $8.85 pmpm

Part E. Determine LBS 2000 capitation based on Bedford Group's actual utilization

Need to determine the cost/admission for Hospital 3.
Then determine cost/day for 2000

Total inpatient Hosp cost = Total cost – Total outpatient cost
Total inpatient cost Hospital 3 = Total inpatient cost – Inpatient cost @ Hosp 1 – Inpatient cost @ Hosp 2
Cost/Day Hospital 3 = Total inpatient cost @ Hosp 3 / (Hosp 3 days / 1000) / (members / 1000)
Cost/admission Hospital 3 = cost/day hospital 3 × (# of days / # of admissions)

Total inpatient hospital cost = $24,000,000 - $10,080,000 = $13,920,000
see Table MC-5 for outpatient costs MC-5 ($4.00 × 210,000 × 12)
Hosp 1 cost = $600 × 2 × 210 = $252,000 Table MC-7 - cost/day, Table MC-2 - days/1000
Hosp 2 cost = $1,000 × 27 × 210 = $5,670,000 Table MC-3-for members
Total cost Hosp 3 = $13.92m – 0.252m – 5.67m = $7.998 m
Cost/day Hosp 3 = $ 7.998m / 31/210 = $1,228.57
Cost/admission Hosp 3 = $1,228.57 × 31 / 2.6 = $14,648 Table MC-2

Cost/admission Hosp 1 = $600 × (2/0.4) = $3,000 Table MC-2
Cost/admission Hosp 2 = $1,000 × (27/2.5) = $10,800 Table MC-2

Determine # of admissions for 2000 LBS Assumptions

Hosp 1 = 0.4 × 1.000 = 0.4
Hosp 2 = 2.5 × 0.5 + 2.6 × 0.5 × 0.8 = 2.29
Hosp 3 = 2.6 × 0.5 × 0.2 = 0.26

Determine cost / admission for 2000 LBS Assumptions

Hosp 1 = $3,000 × 1.00 = $3,000
Hosp 2 = $10,800 × 1.50 = $16,200
Hosp 3 = $14,648 × 1.00 = $14,648

Total Inpatient cost 2000 LBS Assumptions

Cost per Hosp = (Admissions/1000) × Cost per admission × (members/1000)
Hosp 1 = 0.4 × $3,000 × 210 = $252,000
Hosp 2 = 2.29 × $16,200 × 210 = $7,790,580
Hosp 3 = 0.26 × $14,648 × 210 = $799,800
Total inpatient cost = $252,000 + $7,790,580 + $799,800 = $8,842,380

PMPM Cost

Inpatient = $8,842,380 / 210,000 / 12 = $3 51
Outpatient = $4 00 × 1 15 × (1 – 0 25) = $3 45
LBS Charge = $1 10
Capitation cost = $3 51 + 3 45 + 1 10 = $8 06

Total Cost

2000 cost = $24,000,000
2000 cost using LBS assumptions = $8 06 × 210,000 × 12 = $20,311,200
Savings = 2000 cost – 2000 using LBS cost = $3,688,800

Solution 16. MC Extension

A. Calculate the actual 2000 and budgeted 2001 degree of healthcare management and factors to consider

Ensure that the unmanaged and optimally managed targets are the same as in the Bedford Groups actual population.

Adjust if necessary for:

- Demographics
- Geographic area
- DRG case mix and severity
- Mix of population covered (e.g., Commercial, Medicare, etc.)
- Whether days for newborns, skilled nursing facility or maternity are included

Note that given information that targets do reflect Bedford Group's demographic and geographic mix. Targets may need to be adjusted for other factors

Degree of healthcare management (DOHM) = (unmanaged - actual days)/(unmanaged - optimal days)

From Table MC-4
2000 DOHM = (345 – 318) / (345 – 180) = 16.3%
2001 DOHM = (345 – 290) / (345 – 180) = 33.3%

B. Describe medical management approaches that may be used to meet budgeted utilization for 2001

- Prospective Review
  - precertification
  - pre-admission testing / same day surgery
  - mandatory outpatient surgery
- Concurrent Review
  - maximum length of stay
  - discharge planning
  - UM nurse: to do hospital rounding, gather information, telephone rounding, review against criteria
  - PCP model: to monitor all care, PCP makes daily rounds, specialists report to PCP
  - Specialist model: specialist in charge but must get case back to PCP asap
  - Hospitalist model: inpatient medical specialist takes care of all rounding for the PCP
- Retrospective Review
  - claim review
  - pattern review

Solution 17. MC Extension

A. Three general categories of Rx relating to manufacturers' patents

1. Generic Drugs:

- no patent protection
- same active ingredients as brand drugs
- cheapest drugs

2. Single Source Brand Drugs:

- no generic or bioequivalent substitution
- protected under patent
- most expensive drugs

3. Multiple Source Brand Drugs:

- patent has run out
- other manufacturers market their own versions of the drug

B. Plan features to control Rx average charges and utilization

- Define scope of drugs covered
- Member cost sharing:
  - lowers amount paid for drugs and drug utilization
  - e.g., copay: higher copays for brand or member pays difference between brand and generic
  - lower maximum benefit
  - coinsurance
  - deductibles
- Require formulary compliance
  - closed formulary is most effective
  - incentive formulary
  - open formulary is least effective
- Mail order options
  - greater discounts through bulk purchase

C. Functions performed by a PBM and how they manage drug costs

- PBM establishes pharmacy networks, achieve retail relationship and discounted pharmacy pricing
- PBM eliminates drug benefits for payers and produce reports
- PBM relies on a network of pharmacies, manufacturers, health plan providers and patients

PBM can:

- Encourage generic and therapeutic substitutions
- Implement/update formulary to include new classes of drugs and therapeutic equivalents
- Establish drug management mechanisms
  - prior authorization: drug appropriateness, avoid drug interactions
  - maximum dispensing limit: avoid stockpiling
  - step therapy: look for alternative and cost effective therapies
- Achieve discounts and rebates from manufacturers; level of rebate depends on market share
- Provider mail order capabilities
  - mail order pharmacies have lower cost and efficiencies

Solution 18. MC Extension

A. Components of Income Statements

Revenue:

- Premium (earned, change in unearned reserve)
- Fees (e.g., PPO rental, ASO, UM fees)
- Coordination of Benefits (COB) Recoveries
- Reinsurance recoveries
- Investment income

Medical Expense:

- Paid claims, capitation and fee-for-service (by hospital, physicians, prescription drugs, etc.)
- Change in accruals
  - Incurred but not reported (IBNR) reserve using lag triangles or other reasonable methods
  - Reported but not paid
  - Change in provider liabilities

Administrative Expense:

- Salaries
- Sales/marketing
- Overhead
- Taxes

Operating gain = Revenue - Claims Expense - Administrative Expense
Try to split by type of business (e.g., Commercial vs Medicare) and by Product (e.g., PPO vs. HMO)

Assumptions Needed:

- Membership projections
  - Sales input
  - Persistency and new business
- Premium increase projections
  - Timing and amount consistent with underwriting and actuarial pricing strategies
- Experience period base to project claims
  - May be incomplete so estimate using IBNR
  - Trend forward: components of trend include medical inflation, utilization, provider contract changes, medical management initiatives, etc.
- Administrative expense assumptions from budget or other projections
- Assumed return on equity (ROE) or expected loss ratio
- Project by line of business or product and then roll up
- Anticipate the impact of timing of changes since all are expected to occur mid-year

B. Impact of Automation

- Decrease lag on paid claims, increase speed of payments
- Cash flow increases, decreases float
- IBNR will decline
- Increased expenses for implementation initially, decrease long term
  - could result in reduced salary expense
- Increase accuracy
- No impact to capitation or fixed salaries

C. Impact of Change to IPA

- Medical costs would be expected to increase
  - Salaries replaced with capitation or fee for service
  - Hard to control utilization which needs to be considered in the trend estimate
- IPA gains negotiating leverage and reimbursement may increase in response
- Broader network could increase enrollment
- Claim projections more volatile than for fixed salary
- Administrative expenses increase due to more UM nurses, etc.

D. Impact of Implementing Stricter UM Controls and a Disease Management Program

- Utilization management shows high ROE
  - investments up front should lead to lower medical costs
- Forecast should show some decrease to claims for current year and more for following year
  - Quantify initiatives and be careful of start-up and looming curve
- In-house disease management
  - all profit would stay with the company
  - continuity of care for DM is critical and can lower future claims expense
  - maybe more effective than outside vendor but company may have less expertise (difficult to project the impact of disease management on financial statements)
- External vendor disease management
  - much of profit goes to vendor
  - less continuity of care between providers
- Disease management initiative may have little impact on current forecast

E. Impact of Legislative Changes

- Premium tax
  - will increase administrative expense
  - could decrease the net operating gain unless adequately priced for (premium increased)
  - some expense can be offset against income tax on risk pool assessments
  - may cause groups to self-insure which would impact the mix of business in the financial statement
- Risk Pool
  - Not easy to determine the impact on financial statements. If the company has more members that qualify, then they will benefit which helps bottom line
- Mandated benefits
  - has a direct increase to claims expense
  - could increase adverse selection and hence claims cost indirectly
  - premium will need to increase in forecast to cover costs
  - system changes will increase administrative expense