Solution #1:

(a) A premium deficiency reserve is needed when it is anticipated that the current premiums are not sufficient to cover future claims and expenses. A gross premium valuation should be done to determine if the reserves in aggregate are sufficient.

It is critical to recognize whether surplus runs the risk of becoming impaired.

Premium deficiency reserves are different from contract reserves in that the premiums were originally intended to be sufficient, but later it is determined that they will not be adequate.

Often, premium deficiency reserves are not held for group customers because rates can be increased in the future, but it is necessary to consider how long rates are guaranteed into the future if premiums are locked in at a level below expected costs.

Policies can be grouped and sufficiencies within the grouping can offset deficiencies. The grouping should be material to the results and consistent with the way the company manages the business.

Suggested groupings: Medical – individual, large group, small group, mega group
Medicare
Medicaid
HMO

(b) Reserve increases – must be realistic and need to consider whether regulatory bodies will allow; consider the impact of rate increases on persistency.

Enrollment – improvements cannot be used to eliminate the deficiency unless historically proved to do so.

- Consider lapses
- Cancellations – only include if likely to occur.

Interest Rate

Future Claims Trend

Expenses – if other products will cover overhead, overhead does not need to be included.

Taxes – projection should be after-tax.

Provider Reimbursement Contracts: Amounts owed can only be included if the amount has been determined and actually billed.

Solution #1 - Continued

Include Capitation at the current levels.

Consider the need to purchase services on a fee-for-service basis (more expensive) if a contracted provider goes insolvent.

Reserves must be held from the valuation date until the deficiency no longer exists.

Some deficiencies are eliminated through premium increases; some continue forever.

(c) Premium Deficiency Reserve:

=	Present Value of Future Claims
+	Present Value of Future Expenses
−	Present Value of Future Premiums
−	Present Value of Future Premiums
−	Current Premium Reserves
−	Current Contract Reserves
−	Current Claim Reserves

Premium in 1999 = 8,352,000
Employees = 3,000
Increase = 5%
So, premium in 2000 = $8{,}352{,}000 \times 1.05 = 8{,}769{,}600$

Claims 7/98-6/99 = 8,769,000
Trend from 1/99-7/00 from midpoint to midpoint
Trend factor = $(1.009)^{12} \times (1.012)^{6} = 1.196$

Therefore, expected claims for 2000 are (8,769,000) (1.196) = 10,488,832.

There are no contract reserves held.
Administrative expense $= 12 \times 3000 \times 12 = 432{,}000.$
Commission 5% premium $= 8{,}769{,}600 \times 0.05 = 438{,}480.$

Expected claims	10,488,832
Premium charged	−8,769,600
Administrative expense	432,000
Commission	438,480
Deficiency Reserve	2,589,712

Solution #2

(a) Table MM-1 (in 000s)

1998 reported incurred claims	= 1,129,000
1999 reported incurred claims	= 1,283,000
Increase	= 13.64%

Per Table 2, claims trend:

The claims trend from midpoint 1998 to midpoint 1999

$$= \underbrace{\left[(1.008)^6\right]}_{\text{6 mos. '98 trend}} \times \underbrace{\left[(1.009)^6 - 1\right]}_{\text{6 mos. '99 trend}} = 10.69\%$$

Member Growth must account for the difference:

$$\text{Member growth} = \left(\frac{1.1364}{1.1069} - 1\right) = 2.66\%$$

This calculation assumes that the age/sex and plan design at Wonderful Life has not changed. If it has, then 1998 and/or 1999 claims should be adjusted to reflect this before determining growth increase percentages.

Solution #2 – Continued

(b) Our trend = $\left[(1.008)^6 \times (1.009)^6 - 1\right] = 10.69\%$

Industry trend = 7.0%.

Reasons for difference:

- Plan design – high/low deductible, Rx coverage
- Regional variances
- What is industry trend?
  - Premiums?
  - Claims?
  - CPI?
  - Plan designs?
- Major medical is not MCO and with lesser controls, its trend may be higher.
- Wonderful Life's aggressive negotiations with PPOs might help immunize against cost shifting.
- If Wonderful Life's trend can be supported by the market without reducing prospects and losing clients, it is not a major concern.

Trends:

Trend is made up of two main components:

- Increase in price levels
- Residual trend.

The primary reason trends can vary from the industry and is not price but the residual price.

→ Utilization
→ Case severity mix
→ Demographic changes (aging population)
→ Geographic mix
→ New technology
→ Shifting practice patterns.

Also, plan design is key.

→ Plans with different deductible/co-pay provisions will have different impact on leveraged trend factors and leveraging effect of fixed deductible.

Solution #2 – Continued

(c) Underwriting Cycle:

Claims trends are determined by looking at historical changes in prices and utilizations and assuming that those changes will persist. When claims trends are rising, insurance companies are playing catch-up since they cannot anticipate the higher-than-expected trend. (This is the bad part of the cycle.) When trends are decreasing, the insurers are overestimating trend and this is the good part of the cycle.

Essentially, premium increase trends lag claim increase trends.

The cycle is also driven by more aggressive underwriting in periods of gain and more conservative in periods of loss.

Underwriting cycles are the nature of the business. Managed care has some better control due to provider contracting.

If loss ratios are increasing, this implies that the company is in the downward portion of the underwriting cycle and that trends may be higher than anticipated. However, because the industry trend is at 7%, Wonderful Life cannot increase premiums to much without concern for losing business.

Surplus must be saved during "good times" to compensate for the "bad times."

Cycle has been six years (three years of gains and three years of losses) and was driven, to a great extent, by changes in claim trends.

Results for individual plans have frequently been different from the aggregate cycle.

If the historical cycle of three years followed by three years of losses is used to predict the future, underwriting gains should be expected in 1999. If the extended nature of the most recent phases is an indication, the period of underwriting losses could continue through 1999.

Wonderful Life's enrollment was flat in 1997 and 1998 (see Tables MM-5a, MM-5b, or MM-6b) but increased between 1998 and 1999.

The loss ratio increase between 1998 and 1999 might be related to the underwriting cycle, if the enrollment growth was due to more aggressive underwriting.

There was also price pressure to market.

Solution #3

(a)

Credibility	Group 1 0%	Group 3 50%
Manual Claims:		
Base Claim Rate	263	263
× Trend	1.00	$(1.012)^2$
× Age/Sex	0.9	1.1
× Plan Design (Benefit)	0.7	0.75
× Region	0.9	0.9
	149.12	199.99
Experience Claims:		
Claims < 50K	N/A	567,000
× Trend		$(1.09)^{12}(1.012)^{8}$ *
× PEPM		$\frac{567{,}000(1.09)^{12}(1.012)^{8}}{300(12)} = 192.94$
Gross Premium:		
Z = Credibility Factor		
[(1–Z) (Manual Claims)	(1) (149.12)	(0.5) (199.99)
+Z × Experience Claims]		+ (0.5) (192.94)
+ Admin.	20	15
÷ (1 – commission % – risk %)	(1 – 0.1 – 0.06)	(1 – 0.06 – 0.04)
	$201.33	$234.96

* 9/1/2000 midpoint

Solution #3 – Continued

(b)

	Experience Refund Balance	
=	Prior Balance Carry Forward	–25,000
+	Premiums	8,352,000
+	Investment Income	0
–	Claims > 50K	5,658,000
+	Pooling Charge	29.26 (12)(3000)
–	Administration	(3000)(12)(12)
–	Commissions	0.05 (8,352,000)
–	Risk/Profit	0.03 (8,352,000)
		515,480

Pooling Charge:
Mid-Point = 1/1/99

Trend Adjusted:

$$\text{Pooling Charge} = \frac{35}{(1.09)^{12}(1.012)^{6}} = 29.26 .$$

Solution #4

(a) Projection Elements are:

1. Definition of Projection Cells
   - Define by market segments, product classes, etc.
   - Need to be homogeneous.

2. Base Period
   - Should generally be a period of 12 months, to eliminate seasonal effects.
   - At least three months of claims run-out be available.
   - Ability to reconcile with financial statements.

3. Projection Period
   - Usually 2-5 years.
   - Should have a clear understanding of purpose for which it will be used.

4. Membership Projection
   - Changes to membership can be expressed as absolute increases or decreases, or in the form of percentage changes.
   - Consider interrelationship of membership growth and premium rate increases.
   - Know whether projections are sales goals, desired results, or realistic best-estimate.

5. Income Projection
   - Could be on a cell basis or a group-by-group basis.
   - For early months, use assumed average rate increases.
   - For later months, set rate increases based on projected incurred claim levels, to produce a specified target loss ratio.
   - Consider "product mix" such as changes in benefits, demographics composition, morbidity level, etc.

6. Claims Expense Projection
   - Apply specific provider contracting assumptions
   - Apply trends to base period monthly claim value.
   - Start with an average claim-per-member per value for the 12-month base period, then projecting monthly value corresponding to trend changes.
   - Applying factors to reflect seasonal variations.
   - Loss ratios are not generally a good vehicle because the implicit assumption is that claim levels will be consistent with pricing assumptions.

Solution #4 – Continued

7. Administrative Expense Projections
   - Based on separate budget.
   - Adjusted for membership.
   - Expenses should be treated consistently with expenses in the company's financial statement.

8. Other Items
   - Premium tax, commissions, investment income, etc.

9. Comparison of Interim Period Results
   - To test reasonableness of the forecast.
   - Some fine-tuning of the forecast may be needed.

(b) Important to restate base values because:
- To produce realistic picture of the underlying experience.
- Restated results can be viewed as business performance reports.
- Restated result is a more accurate representation of performance.

(c) (i)

Determine the effect of the above items on restated operating earnings before taxes.

$$\begin{aligned} UPR_{Difference} &= UPR_{Restated} - UPR_{Original} \\ &= 32{,}000 - 35{,}000 \\ &= -3{,}000 \end{aligned}$$

$$\begin{aligned} \text{(D/U) Due Unpaid Difference} &= D/U_{Restated} - D/U_{Original} \\ &= 24{,}000 - 28{,}000 \\ &= -4{,}000 \end{aligned}$$

$$\begin{aligned} IBNR_{Difference} &= IBNR_{Restated} - IBNR_{Original} \\ &= 148{,}000 - 150{,}000 \\ &= -2{,}000 \end{aligned}$$

Solution #4 – Continued

Restated Premium Income = 1,584,000 – (–3,000) + (–4,000)
= 1,583,000

Restated Change in Reserve = 4,000 + (–2,000) = 2,000

(ii)

1999 Restated Financial Statement

Premium Income	1,583,000
Paid Claims	1,279,000
Change in Reserves	2,000
Total Claims Expense	1,281,000
Gross Margin	302,000
General Administrative Expense	157,000
Commissions	81,000
Premium Tax	32,000
Total Expense	270,000
Operating Margin	32,000
Investment Income	49,000
Other Income	1,000
Total Other Income	50,000
Operating Earnings before Taxes	82,000
Taxes	30,800
Operating Earnings after Taxes	51,200

Solution #5:

(a) Factors influencing the reasonableness of the raw completion factors include:

- IBNR Model output uses 6-month average completion factors, which may not accurately reflect current run-out patterns.
- System conversion resulted in faster claim payments at all lags.
- Claim lags prior to 1998 may not reflect recent experience.
- System conversion resulted in faster claims submissions by Providers.
- Historical completion factors may be lower than current.
- Year 2000 efforts to reduce claim inventories by year end 1999.
- Removal of claim edits will speed up processing.
- Claim Department overtime to reduce inventories will change recent lag factors.
- Reserve estimates for recent lags will be volatile due to processing changes.
- Completion factors for early months are not a good estimate. For example, the December 1999 hospital factor is too high. Also, the November 1999 hospital factor, as compared to the November 1998 hospital factor, is greater by 26%.
- As a result, adjustments are needed to reflect processing changes to produce reasonable reserve estimates.

(b) Other techniques include: (relevant examples can also be drawn from the case study)

- Simple averaging, such as 3-months, 6-months, or 12-months, is commonly employed.
- Removing "bumps" by throwing out high and low values used in creating the average values not likely to be replicated in future payment patterns. Also, "bumps" can be smoothed by removing catastrophic of "shock" claim dollars from incurred and paid cells.
- Weighted averaging, such as sum of digits, squared sums of digits, or constantly declining percent weighting.
- Using other types of means such as harmonic or geometric means.
- Using dollar weighted ratios by first averaging dollars, then creating ratios.
- Using per-member-age-to-age ratios (first divide payments per lag by exposure to PMPM payments).

Solution #5 – Continued

(c) Adjustments or alternatives to produce an improved IBNR estimate include:

- Blending with the projection method. By dividing small incurred and paid amounts by numbers close to zero, the resulting minor differences are magnified into large swings in incurred claims. Thus, a credibility process is used to substitute for unstable values. Typically, completion factors below 40% to 70% should be replaced with other estimates.
- Also, trended PMPM projections are often employed by replacing the last few months of unstable completion estimates by incurred claim estimates developed by exposed membership by trended PMPM costs. Further, multiple trends and PMPM projections may be used to produce a number of estimates.

- Blending with the Loss Ratio Method: This method could be used when membership is not available and may be used to compare the results of the development and projection methods.
- Historical earned premiums and completed incurred claims can be used to develop a loss ratio pattern. Then the loss ratios are applied to earned premiums for recent months to obtain incurred claims.
- The Loss Ratio Method is often used for newly issued blocks of business.
- Pricing assumptions are often used for loss ratios until experience has developed. However, developing incurred claims may indicate that premiums are inadequate and thus, the Loss Ratio Method would understate incurred claims.

- Application of Credibility Weights: Involves blending completed estimates with projected claim cost estimates. Weights are usually assigned in inverse relationship to how close completion factors are to 1.000. For the first month, the completion factor is commonly zero. Three to five months of completed estimates are often blended with alternative methods.
- Tests of suitability of loss ratios or PMPM estimates is to check figures produced by completion versus projection or loss ratio method.

- Ad Hoc and Other Over-Riding Adjustments: Factors include trends, claim inventory and processing-system changes, and reinsurance coverage.

Solution #6

1. Participation Requirement
   - Minimum 75% in all employer's plans
   - Bailey's has 90%, so this is OK.

2. Minimum Enrollment
   - Needed to achieve efficiency in premium collection
   - Varies by size of employer
   - Bailey's is good, with 1,350 enrolled.

3. Eligible Group – Group Definition
   - Bailey's is a true employer/employee relationship

4. Minimum Size of Group
   - Bailey's is good with 1,500 employees.

5. Eligibility
   - Require an actively-at-work provision.

6. Financial Viability
   - Employer has to be strong financially. Check credit rating and financial information on employer, quarterly results, business plan, proposed expansion or merger.
   - Need financial information on Bailey's.

7. Employer Contribution
   - Expected that employer contributes
   - Bailey's pays 80% of health-care cost.

8. Payroll Deduction
   - Should not be too much higher than other plans to avoid anti-selection.
   - Employees pay 20% of cost regardless of coverage tier.

9. High-Risk Groups
   - Usually excludes high-turnover groups.
   - Usually have a no-write list.
   - Bailey's is a white-collar company.

10. Average Age
    - Want age below 45 to use community rates
    - Calculate an age/set factor for the group and reject it if factor is too high.
    - Bailey's average is below 45.

Solution # 6 – Continued

11. Male/Female Mix
    - Exclude groups with too many females (i.e., 75%) because of high maternity cost.
    - Bailey's has less than 40% females.

12. Part-time Employees
    - Require a minimum number of hours per week.
    - Bailey's only has full-time employees.

13. Past Carriers
    - Do not want employers that have high turnover rate (more than three in last five years).

14. Family Business
    - May give employment to family members to get insurance.
    - Not really a concern with a large employer like Bailey's.

15. Rate Tiers
    - Use same-rate tiers as competing plans.
    - Need to match PPO rate structure in Bailey's case.

16. Benefit Design
    - Avoid rich plan at high price to avoid anti-selection.
    - Avoid providing too rich benefit in HMO compared to indemnity plan.
    - Bailey's HMO benefits are reasonable compared to PPO.

17. Rate Guarantees
    - Typically 12 months.
    - Has Bailey's requested one?

18. Individual Underwriting
    - May require all employees to complete a short-form questionnaire.
    - Minimum required for a large employer life Bailey's.

19. Claim Experience
    - Ask for any information on previous large clams, maternity costs.
    - Is Bailey's claims experience available?
    - Anything that should be known about Bailey's past or future expected experience?

Solution #7

1. Inventory Control
   - Log claims into system properly.
   - All transactions, regardless of form, should be counted.
   - Front-end control. Date stamped and recorded immediately.
   - Transfers to other departments noted with agreed times of return.
   - Store work centrally. Maintain file integrity.
   - Physical inventory of work on hand. Update with daily counts of receipts, productivity, and remaining inventory.

2. Pended/Suspended Claims
   - Largest portion of problem cases
   - Should be documented procedures for every category of suspend claims.
     - Which department is responsible for solving the issue?
     - What information will be needed to resolve the issue?
     - What is the timeframe for getting the information to the decision-maker?
     - What is the timeframe for response?
     - How are decisions conveyed to the claims staff?
     - What is the timeframe for completing the claim?
   - Tracking monitoring mechanism.

3. Work Flow
   - Work flow begins when a claim is received by the organization, not the department.
   - Handle transaction as few times as possible.
   - Use electronic claims submission.
   - Claim work flow should be reevaluated periodically.
     - Major events may have caused changes in work-flow design.
     - Innovative clerk procedures may differ from established work flow. These should be expanded or curtailed.

4. Turnarould Time Management
   - Goals for turnaround time based on:
     - Contractual requirement
     - Regulatory requirement
     - Provider billing cycle
     - Competitor practice.
   - Should be incremental goals for points where a claim stops during processing.
   - Reports to monitor
     - Pended/suspended claim reports
     - Paid claims reports
     - Check register
     - Lag claims report.

Solution # 7 – Continued

- Bottlenecks investigated.
  - Insufficient staff.
  - Delays in resolving pended/suspended claims.
  - Delays in check runs.

5. Staff Training
   - Classroom training for new staff
     - Managed care orientation
     - Probationary period
   - Self-assessment surveys
   - Use quality assurance results.
   - Begin with issues that will affect the biggest improvements.
   - Train those with greatest need.
     - Use standardized materials.
     - Include pages from a procedure manual.

6. Quality Assurance
   - Typical flow of quality review process: The reviewer:
     - Gets report of productivity by analyst.
     - Randomly selects claims for review.
     - Audits claims.
     - Completes the audit sheet.
     - Meets with the analyst to discuss discrepancies.
     - Reaches consensus about which cases have errors.
     - Have the errors corrected.
   - Standards for quality
     - Overall percentage of claims paid correctly.
     - Financial payment accuracies – percentage of claims with right amount paid but with other errors. Add overpayments and underpayments and divide by total amount paid.
   - Audit claims
     - Was claimant eligible at date of service?
     - What was the provider status and payment arrangement?
     - Were procedures, policies, and guidelines followed?
   - Repeated errors indicate training needs, policy clarification, or tightening of policies, guidelines, or procedures.
   - Track adjusted claims
     - Types of claims susceptible.
     - Categories of adjusted claims.
     - Which analysts are responsible for adjusted claims?

Solution # 7 – Continued

7. Policies and Procedures
   - Comprehensive policy manual.
   - Standard format for procedures.

8. Coordination with Other Departments
   - Positive working relationships.
   - Information and process needs should be identified with every department.
   - Monitoring/feedback to evaluate effectiveness of coordination.
   - When claims decisions are delayed or payments inaccurate, customers do not care which department is at fault.

9. Data Processing
   - Cut steps with automation.
   - Improve accuracy, workflow, consistency.
   - The system should provide necessary date (demographic, medical, payment eligibility, benefits).
   - Validity edits during data entry.
   - Claims adjudication.
   - Easy to use system.
   - Staff in areas responsible for data used in claims processing must understand their impact.

10. Customer Service
    - Track complaints from members/providers.
    - Maintain close contact with Member Services and Provider Relations.

Solution #8

(a) Potential markets for individual disability and health insurance:

Personal Medical Expenses

1. Hospital Inpatient – Those who are apprehensive of high hospital costs and are willing to bear OPD costs or have insufficient funds for more coverage.

2. Major Medical – Generally for those who want coverage for extremely expensive medical cost at a low premium, are willing to pay for routine costs, and can afford considerable cost sharing.

3. Comprehensive Coverage – Have ability to pay and are unwilling to share in risk of high medical expenses.

4. Short-Term Medical – For newly qualified students as they enter professional market or for individuals between jobs or ineligibility period. Usually covers a range from 60 to 180 days.

5. Supplementary Medical Expense Product
   - Complements a limited medical expense policy or fills a general need irrespective of other policies.
   - Medicare Supplemental Insurance may pay for benefits not covered under Medicare.
   - Design a policy with a very high or no deductible to supplement.

6. Travel Insurance, Travel Sickness, Sports Accidents – Customer-specific.

7. Personal Insurance Disability Income Protection – For a self-employed individual or someone without benefits at work;
   - Looking for an appropriate replacement ratio after social insurance programs.

8. Supplementary Disability Coverage – Generally tops-up coverage if inadequate individual policy or limited group policy.

9. Business Overhead Expense Disability – Pays for business overhead expense once you get disabled.

10. Disability Buy-Out Insurance – Pays for the amount equivalent to disabled partner's share in business so that remaining partners may purchase his share.

Solution # 8 – Continued

(b) Marketing Channels

1. Agent and Broker – Most prevalent. Agent may be exclusive or general agent.

2. Cross-Selling: Sell one company's life products and another company's health product.

3. Sell Supplemental Health Insurance to employees on a deduction basis. Requires rough canvassing of the employees by agents or special solicitors.

4. Direct Marketing Sales - Mass – Most common to associations. Sponsoring organizations is better, sometimes just a list.

5. Direct Marketing Sales – Newspaper – Customer has to call or send a coupon for more information. Call may be followed up by a call from the insurer to solicit client.

6. Direct Marketing Sales – Telephone – Initial contact is by phone. Objective of call is to establish contact.

7. Direct Marketing Drawbacks – Lack of face-to-face. Limited to simple coverage with low premium.

8. Site Marketing – Vending machines/booths at airports. Simple, low probability, high benefit products (e.g., accidental disability, travel insurance).

9. Group Conversions – High premium, low benefit.

Compensation Approaches

10. Large, early-year commission. More common for disability income insurance than for medical expense. Reflects the fact that disability is often sold in conjunction with life. Also, disability historically profitable, so deserves sales emphasis. Example is 55% first year, 5% afterwards.

11. Lower Initial and Higher Renewal Compensation: Common for medical expense policies because premium is generally higher and persistency poorer. Pattern helps to make first year commission attractive enough to stimulate sales and sufficiently small to amortize expenses.

12. Single Premium Compensation: May pay same sales compensation on single-premium products as for annual premium products as long as rate is not too high. May need to do it to avoid agent's selection of one product.

Solution # 8 – Continued

13. Employee Payroll and Telemarketing: May use salaried personnel instead. Could use agents compensated on a percentage-of-premium basis.

14. Vesting in Renewal Compensation: Vesting greater if agent is not an employee of the company. Limit vesting if agent was financed by the company at the beginning. Vesting may vary in proportion to agent's length of service.

15. Compensation Treatment on Premium Increases: Treat premium increases on attained-age rated policy or with built-in increases as renewal increases for compensation purposes. Increase in benefit limits, initiated by agent, possible first year commission.

16. Persistency Bonuses: Sometimes paid to encourage better customer service and more careful selection of customers. More important for medial expenses insurance than for life or LTD because of the higher lapse rates seen. Some companies offer a volume bonus on disability business. May also pay higher commission on less frequent premium payment periods to recognize better persistency inherent to the premium mode.

17. Replacement Policies Compensation: First year compensation only on increase in premium as a disincentive to unnecessary switching. Some companies may pay full compensation to encourage replacement.

18. Conversion Policy Compensation: Usually not much involvement from agent thus no sales compensation paid. The agent may receive a service fee for the work he did to help. Full compensation is paid in a fully individual underwritten policy sold in lieu of the group conversion.

Solution #9

(a) In setting rates, the credibility of the group's experience and the confidence are considered. Credibility of data is a relative concept and is the weight to give to experience. Confidence is an absolute measure and represents the likelihood that the experience is close to the theoretical value. Hence, partial consideration is given to group's experience and part to the manual rate when setting rates. ABC's medical experience is deteriorating at a greater rate than the overall block. Life rates were set a rate manual or "pure premium" levels.

Why health rates are increasing and life rates are not decreasing – as a medium-sized insurer, the life business is not credible, while the medical business is 50% credible. This is due to the fact that:

1. As volatility of claim experience decreases, credibility increases. The medical business is much less volatile than the life business due to lower claim amounts and more frequent claims. Therefore, the confidence in experience is higher since medical claims are homogeneous (similar in size).

2. To be considered credible, the life business needs many more life-years of experience than does medical; confidence in the group's actual experience is low as there are few claims.

(b) Methods that can be used to pool life or medical claims:

1. Remove catastrophic claims above a set level from experience. This is also know as specific claims pooling. A charge to cover the average cost of catastrophic claims is charged to all groups.

2. Aggregate stop loss where aggregate claims experience above a set level is removed from the experience. Again, a charge representing the average cost of aggregate pooling is charged to all groups.

3. The group's experience can be credibility-weighted with the entire pool's experience. If the group's experience is considered $Z\%$ credible, then:

$$\text{Credibility} - \text{Weighting} = Z \times \text{Group's Experience} + (1 - Z)\text{Pool Average Claim Cost.}$$

Solution # 9 – Continued

4. Multi-year averaging is a weighted average of several years' experience that helps smooth out random fluctuations in experience. As an example:

   Period Claims in year A =

   $$\frac{\text{Group claims in year } A\times 5+\text{group claims in year } (A-1)\times 3+\text{group claims in year}(A-2)\times 1}{9}$$

5. Loss Ratio/Rate Increase Limits. Similar to aggregate stop loss. Must charge a pooling charge. Place an upper limit on loss ratio for setting future rates.

(c) Disadvantages:

1. Employer takes financial risk that would otherwise belong to the insurance company.
2. Employer now must take care of administration or pay a TPA to administer.
3. May need stop loss coverage from insurer.
4. Company must be able to handle claim fluctuations.

Advantages:

1. Don't subsidize bad experience of other groups that are insured. The goal is to save money.
2. Avoid premium tax, risk margins, and state-mandated benefits.
3. Because there is less regulation, the company has more flexibility in plan design and funding.
4. Employer cash flow has increased flexibility and possibly increased investment income as assets backing liability are held directly by employer.

Solution #10:

(a)

1. Calculate IN network Charges	**IN network = 0.7 × industry average**
Diagnostic =	$30 \times 0.7 = 21, 15 \times 0.7 = 10.5$
Preventative =	$40 \times 0.7 = 28, 20 \times 0.7 = 14$
Restorative =	$50 \times 0.7 = 38.50, 25 \times 0.7 = 17.5$
Prosthodonitic =	$400 \times 0.7 = 280, 500 \times 0.7 = 350$
2. Calculate Gross IN Network Charges	**Gross per member per month = projected annual services per 1000 member IN NETWORK* average cost per service/1000/12**
Diagnostic =	$800 \times 21 / 1000 / 12 = 1.4$
Diagnostic =	$700 \times 10.5 / 1000 / 12 = 0.6125$
Preventative =	$650 \times 28 / 1000 / 12 = 1.5167$
Preventative =	$200 \times 14 / 1000 / 12 = 0.2333$
Restorative =	$300 \times 0.9 \times 38.50 / 1000 / 12 = 0.8663$
Restorative =	$150 \times 0.9 \times 17.50 / 1000 / 12 = 0.1969$
Prosthodonitic =	$200 \times 0.9 \times 280 / 1000 / 12 = 4.20$
Prosthodonitic =	$100 \times 0.9 \times 350 / 1000 / 12 = 2.625$
3. Calculate Gross OUT Network Charges	**Gross per member per month = projected annual services per 1000 member OUT NETWORK* average cost per service/1000/12**
Diagnostic and Preventative	No changes because no out of network benefits paid for any diagnostic or preventative
Restorative =	$300 \times 0.1 \times 55 / 1000 / 12 = 0.1375$
Restorative =	$150 \times 0.1 \times 25 / 1000 / 12 = 0.03125$
Prosthodontic =	$200 \times 0.1 \times 400 / 1000 / 12 = 0.66667$
Prosthodontic =	$100 \times 0.1 \times 500 / 1000 / 12 = 0.416667$

Solution # 10 – Continued

(a)

4. Calculate Gross IN Network Cost Sharing	**IN network cost sharing per member per month = projected annual services per 1000 member IN NETWORK* average copay per service/1000/12**
Diagonostic and Preventative	0 because copay is 0
Restorative =	$300 \times 0.9 \times 15 / 1000 / 12 = 0.3375$
Restorative =	$150 \times 0.9 \times 15 / 1000 / 12 = 0.16875$
Prosthodontic =	$200 \times 0.9 \times 100 / 1000 / 12 = 1.50$
Prosthodontic =	$100 \times 0.9 \times 100 / 1000 / 12 = 0.75$
5. Calculate Gross OUT Network Cost Sharing	**Out of network cost sharing per member per month = projected annual services per 1000 member OUT NETWORK* average copay per service/1000/12**
Diagnostic and Preventative =	0 because no out of network
Restorative =	$300 \times 0.1 \times 25 / 1000 / 12 = 0.0625$
Restorative =	$150 \times 0.1 \times 25 / 1000 / 12 = 0.03125$
Prosthodontic =	$200 \times 0.1 \times 250 / 1000 / 12 = 0.416667$
Prosthodontic =	$100 \times 0.1 \times 250 / 1000 / 12 = 0.208333$
6. Calculate NET IN Network Charges	**NET IN network charges = gross per member per month less gross in network cost sharing**
Diagnostic =	$1.4 - 0 = 1.4$
Diagnostic =	$0.6125 - 0 = 0.61$
Preventative =	$1.5167 - 0 = 1.52$
Preventative =	$0.2333 - 0 = 0.2333$
Restorative =	$0.8663 - 0.3375 = 0.5288$
Restorative =	$0.1969 - 0.16875 = 0.02815$
Prosthodontic =	$4.20 - 1.50 = 2.70$
Prosthodontic =	$2.625 - 0.75 = 1.875$
7. Calculate NET OUT Network charges	**NET OUT network charges = gross per member per month less gross OUT network cost sharing**
Diagnostic and Preventative =	No charges because no benefits paid for any diagnostic or preventative.
Restorative =	$0.1375 - 0.0625 = 0.075$
Restorative =	$0.03125 - 0.03125 = 0$
Prosthodontic =	$0.66667 - 0.41666 = 0.25$
Prosthodontic =	$0.41667 - 0.20833 = 0.20833$

Solution #10 -- Continued

(a)

8. Calculate NET TOTAL Network Charges	**NET TOTAL = NET IN network charges + NET OUT network charges**
Diagnostic =	1.4 + 0 = 1.4
Diagnostic =	0.61 + 0 = 0.61
Preventative =	1.52 + 0 = 1.52
Preventative =	0.2333 + 0 = 0.23
Restorative =	0.5288 + 0.075 = 0.60
Restorative =	0.02815 + 0.00 = 0.03
Prosthodontic =	2.70 + 0.25 = 2.95
Prosthodontic =	1.875 + 0.20833 = 2.08
9. Calculate GRAND TOTAL	**Sum of NET total diagnostic, preventative, restorative, prosthodontic**
	+ 0.61 + 1.52 + 0.23 + 0.60 + 0.03 + 2.95 + 2.08 = 9.42

(b) 1. Age/Sex
- Costs vary by demographics.
- Males usually lower dental costs.
- Hockey team usually all young males.
- Hockey prone to teeth injuries $\Rightarrow$ may not want to lower.

2. Regional
- Costs and utilization vary by regions.
- Northeastern U.S. tends to have higher costs.

3. Industry/Profession
- Dental costs vary by industry
- Teachers, actors, and athletes tend to have higher costs.
- Hockey team prone to dental "accidents."

4. Participation Levels
- Dental experience varies by low many participate in the plan.
- Need higher participation to keep costs down.

Solution # 10 – Continued

(b)

5. Benefit Designs
   - Cost-sharing feataures
   - Copays
   - Pre-exclusions
   - Industry data will likely have different benefit designs than this plan.

6. Trend
   - Industry data likely collected some time ago.
   - Dental Costs increase over time.
   - Adjust data to take into account current expense levels.

7. Reimbursement Mechanism/Utilization Management
   - Costs of league will vary from industry depending on type of network and reimbursement mechanism.
   - Hockey teams play "road" games and may be at out network when need dental care.

8. Plan Financing/Employer Contributions
   - How plan/premiums collected impact who enrolls
   - Want 50% contribution or 100% participation to keep costs down.

Solution #11

(a) Uses of reinsurance include:

- Improve financial capacity: Can sell higher benefit amounts and longer benefit periods than otherwise financially able.
- New business growth: Sell many policies in a short amount of time using reinsurer's advice to quickly get to market.
- Stabilize earnings: Smooth random fluctuation.
- Reduce capital strain: LTC is a capital-intense product due to active live reserves and risk-based capital requirements.
- Improve balance sheet position: Meeting rating analysts' scrutiny and ratio requirements.
- Improve intellectual capacity: Knowledge and reinsurer's expertise in design, pricing, underwriting, etc.
- Acquisition: Buy profitable blocks of LTC insurance from other companies who want to leave market. The buyer assumes all obligations from the seller's portfolio through an assumption reinsurance agreement to give enough time to decide which company's paper will be used to write the policies. This improves persistency and maximizes values of policies purchased for both parties.
- Joint venture: Mutual interest of two companies entering the market can be a fronting arrangement, can be used when there is a lacking of ceding company commitment.
- Fronting may be used because the reinsurer is not licensed as direct insurer.
- LTC is a perfect candidate for reinsurance since it has a low frequency of accuracy but high costs upon occurrence.
- LTC is a relatively new and evolving product and there is little insured data. Experienced LTC reinsurer can help guide the company in expanding market share in a stable and profitable way.
- Reinsurance has strategic guidance, marketing support, market research sales compensation, design, product, development pricing, etc.

Solution # 11 -- Continued

(b) Criteria for selecting a reinsurer:

- Financial strength and continuity: Is the reinsurer financially strong enough to handle the growth? Will the reinsurer be able to withstand strain during poor experience?
- Rates and terms: Be sure company agrees with reinsurers' suggestions. Reinsurers manage results only as long as participating but ceding company is still liable for the LTC policies.
- Services: Broad range allows flexibility and meets ceding company's needs.
- Flexibility: Willing to adapt to different market changes and situations. Different reinsurance techniques off varying degrees of flexibility.
- Experience: Are they experienced in LTC? How has their financial performance been?
- Understanding: Do they do their own underwriting or farm it out for a fee? Does the contracted underwriter have incentive to focus on financial performance?
- Loss of profit: Consider amount of lost potential profit when deciding what percent to co-insure.
- Management time: Reinsurance should reduce the need for ceding company's management involvement.
- Business relationship: Good rapport is needed when unforeseen arises.
- Degree of expertise in LTC.
- Reinsurance administration costs: Reinsurer's requirements and amount of risk willing to accept, affect ceding company's administrative costs.
- Availability of reinsurance to produce profit on its portfolio is just as important to its continued existence as it is for primary company.

Solution #12:

(a) Potential reasons for low paid claims in 1996 relative to more recent years:
- Initial underwriting (short-form) leads to select a healthy population.
- Favorable effect of underwriting is strongest in first year.
- Actively-at-work requirement results in a more select group.
- 1996 payments are limited to 1996 incurrals.
- 1997 to 1999 may include several years of incurrals.
- Notice of claim may be delayed, especially in the case of a long elimination period.

(b) Basic assumptions behind cumulative antiselection theory.

CAST Theory Assumptions:
1. Antiselection occurs in health policies, whereby high users continue their policies and low users do not.
2. This causes lapses to occur whereby "good" risks exit for a different policy (higher lapse) and "impaired" risks stay on board (lower lapse rates).
3. This causes our morbidity experience to deteriorate.
4. This causes a need for us to raise premiums to meet even higher morbidity.
5. This causes further antiselection whereby we go back to step 1 (endless cycle).

More:
1. Antiselection is higher on health insurance than life because:
   - Frequency of claims is higher.
   - Easier for insurer to predict being sick than dying.
   - Elective/voluntary procedures.
2. Lapse rates are much higher for a block of health policies than for life policies.
3. CAST theory stronger for health because more of the bad risks stay on.
4. Split lives into healthy and impaired status.
5. Develop loss ratios for classical reserves and CAST reserves – CAST reserve long range will continue to deteriorate even if select-ultimate adjustments made to classical reserves.

- Divide population: $l_x = \underset{\text{healthy}}{{}_a l_x} + \underset{\text{impaired}}{{}_i l_x}$

  Instead of ultimate claim costs, claim costs that depend on duration are used throughout the life of the policy.
  - Claim costs increase with duration.
  - Each group, healthy and impaired, has claim costs independent of duration but dependent on attained age.

Solution #12 – Continued

Healthy lives are always select. The select factor applies at every duration.

$${}_aS_t = (\text{Select factor}) \times S$$

Published values of aggregate claim costs are correct for durations 0 and 1.

$$l_x S_x = {}_a l_x \; S_x$$

$$l_{x+1} S_{x+1} = {}_a l_{x+1} \; {}_a S_{x+1} + {}_i l_{x+1} \; {}_i S_{x+1}$$

- Divide claims costs:

  Mortality: ${}_aS_{[x]+t}$
  Impaired: ${}_iS_{[x]+t}$
  Total: $S_{[x]+t} = {}_aS_{[x]+t} + {}_iS_{[x]+t}$

- $q^{ai}_{[x]+t} = P\left(\text{member of } {}_al_{[x]+t} \text{ becomes member of } {}_il_{[x]+t+1}, \text{net of reserves}\right)$

- Claims costs of impaired lives are proportional to the claims cost of health lives:

  ${}_iS_{[x]+t} = k_2\left({}_aS_{[x]+t}\right)$
  $k_2 > 1$
  $k_2 = \text{function of } [x], t$

- ${}_iq_{[x]+t} = k_1\left({}_aq_{[x]+t} - u\right) + u$
  $0 < k_1 < 1$
  $u =$ "pure" lapse rate

  ${}_iq_{[x]+t}$ and ${}_aq_{[x]+t}$ are the probabilities of lapsing from each class.

Solution # 12 -- Continued

(c)

- Validate Lapse Assumption:

  Lapse rate for period

  $$= \frac{\text{Total active lives at beginning of period} - \text{Total active lives at end of period}}{\text{Total active lives at beginning of period}}$$

  Pricing Assumption Lapse Rates:
  1996: 0.40
  1997: 0.25
  1998: 0.25

  Actual lapse rates are consistent with pricing assumptions.

- Determine Restated Incurred Claims

  Incurred Claims = Paid Claims + End-of-Year Claim Reserves - Beginning-of-Year Claim Reserve

  Restated Incurred Claims:
  1996: 2,352,000
  1997: 2,664,000
  1998: 2,563,000
  1999: 2,089,000

- Determine Actual-to-Expected Claim Cost Ratios:

  Number of healthy lives × expected incurred claim cost for healthy lives + number of impaired lives × expected incurred claim cost for impaired lives.

  Expected Claims:
  1996: 2,352,000
  1997: 2,657,200
  1998: 2,508,800
  1999: 1,978,000

  $$\text{Actual-to-expected ratio} = \frac{\text{Restated incurred claims}}{\text{Expected claims}}$$

Solution # 12 -- Continued

Actual-to-expected ratios:

1996:	1.000
1997:	1.003
1998:	1.022
1999:	1.056

Restated claims are consistent with pricing assumptions for 1996, but higher in subsequent years.

The gap between restated claims and pricing assumptions is growing.

- Development of CAST Claim Costs:

$$\text{1996 healthy life claim cost} = \frac{\text{restated incurred claims}}{\text{number of lives}} = 49.$$

At each duration, claim costs for healthy lives are proportional to those assumed in pricing.

Pricing assumptions for healthy life expected claim costs in other years are consistent with experience.

- Estimate the Healthy/Impaired Partition:

Solve for X (the number of healthy lives).

X × expected claim cost for healthy lives
+ (Total active lives − X) × expected claim cost for impaired lives
= restated incurred claims.

1996:	Healthy:	48,000	Impaired:	0
1997:	Healthy:	28,563	Impaired:	237
1998:	Healthy:	20,958	Impaired:	642
1999:	Healthy:	15,217	Impaired:	983

The partition into healthy and impaired lives is less favorable than assumed in pricing.

Solution # 12 – Continued

- Recommendations for Additional Analysis:

  - For each future duration, project the probability that a healthy life will lapse, ${}_{a}q_{[x]+t}$.
  - For each future duration, project the probability that a healthy life will become impaired, $q^{ai}_{[x]+t}$.
  - For each future duration, project the numbers of healthy and impaired lives, ${}_{a}l_{[x]+t}$ and ${}_{i}l_{[x]+t}$.
  - For each future duration, project the amount of claims.
  - Determine the premium per life necessary to achieve the target profitability for this block of business.

(d)

- Rate increases can make antiselection worse.
- Rate increase can result in more lapses.
- The additional lapses tend to come from the healthy lives.
- The added lapses will result in a higher cost per remaining policy.
- A rate increase can lead to an assessment spiral.
- There may be contractual limits on the right to raise rates.
- Rates may not be changed for a "noncancelable and guaranteed renewable" contract.
- State insurance departments may not approve or take a long time to approve the rate increase.
- Or there might be long delays in approval.

Solution #13

(a) Advantages and disadvantages of providing medical benefits to retirees:

Advantages:

1. The benefits were popular when the retirees were active employees and they are familiar with them, so the retirees pressure the employer to continue them.
2. Offering retirees benefits allows the company to reward employees with a long time of service with the company.
3. As retiree benefit costs increase, there is a need for retirees to be able to choose more limited coverage as the required contribution grows.
4. Increasing cot of retiree benefits encourages employers to adopt a defined-contribution approach and offering flexible benefits allows employers to utilize this approach.

Disadvantages:

1. It is difficult to maintain communication since many retirees may live out of the area and may not be able to attend company-sponsored events.
2. Retirees may have less of a need for flexible benefits since they may be a more homogeneous group than active employees.
3. The reasons for giving flexible benefits to active workers do not exist for retirees.
4. The employer could incur large costs due to antiselection by those with chronic conditions who will elect options with the maximum coverage.

(b) Approaches to establishing credit in a retiree flexible benefit plan:

The employer determines the amount of credits to set aside in a fixed credit pool for each retiree based. As an example, credits can be based on service, age, or dependent status. The amount of credits can be distributed in one lump sum or in annual payments. The retiree determines how to spend credits:

- Retiree can use the credits as a bank and draw down the account every year based on selected options.
- The lump sum can be converted into an annuity with similar options as available in the pension plan.

The credits can be used to purchase medical, dental, or life insurance sponsored by the company or by an outside organization.

Solution # 13 -- Continued

(c) Methods available to QRS to reduce its retiree medical costs:

- Integrate retiree medical benefits with Medicare on an exclusion or a carve-out basis instead of standard COB.
  1. Standard coordination of benefits
  2. Exclusion: Excludes any benefit payable from primary plan, then apply the benefit formula from the secondary plan.
  3. Carve out: Employer benefit is determined as if there are no other plans, then other plan benefits/Medicare are subtracted from employer plan benefits.
  4. Supplement: A supplemental plan pays for expenses the primary plan does not.

- Introduce or reduce customary and reasonable expense limits.

- Encourage spouse to buy coverage from his/her own employer by applying penalties if he/she does not.

- Introduce dynamic benefit provisions (e.g., change deductibles as costs increase).

- Introduce managed care by using
  1. Utilization Review programs
  2. Large-claim management
  3. PPO, POS, or HMO
  4. Centers of excellence (e.g., cancer)
  5. Health care coalitions to address quality, affordability, and access issues.

- Manage pharmacy benefits using:
  1. Formularies
  2. Drug utilization review
  3. Requiring mail order for maintenance drugs
  4. Use of preferred pharmacies and real time administration
  5. Use of more favorable discounts and rebates.

- Increase retiree contribution level.

- Make eligibility more difficult to qualify for (e.g., stricter than pension plan qualification).

- Drop retiree coverage.

Solution #14

(a) From the perspective of the hospital, their issues are summarized as:

- Can it educate its physician members to practice sound medical management?
- Is there an incentive plan in place for physicians to achieve to desired results?
- What risks are there if members seek care at other participating hospitals?
- Risk involved for catastrophic claims
- Risk for out-of-network usage
- Risk for changing demographics from current situation
- Bedford's underwriting capability; product mix
- Capitation should have some margin over and above most likely costs.

From the perspective of the Bedford Group, their issues are summarized as:

- Will capitation lead to underutilization
- Who is at risk when members use other hospitals, either in or out-of-network
- Capitation will lead to more certainty in projecting costs
- Should align goals of utilization management of Bedford with the Hospital
- Will the hospital be persuaded to send patients to other hospitals since they will not get any more money.

Solution # 14 – Continued

(b) Evaluation of a $15.50 capitation level

First determine 1999 pmpm costs:

	Payment Table MC-7 for Hospital ID 1	Utilization Table MC-2 for Hospital ID 1 in 1999	Pmpm
Medical	$1,200 / day	70 days / 1000	$7.00
Surgical	$1,500 / day	60 days / 1000	$7.50
Psyche	$0 (not covered)	N/A	$0.00
Substance Abuse	$600 / day	2 days / 1000	$0.10
Maternity*	$2,200 / case	13 cases / 1000*	$2.38
SNF*	$600 / case	0.5 cases / 1000*	$0.03
Total			$17.01

*Reimbursement for SNF and Maternity is on a per case basis, therefore, utilization has to use admits instead of days.

Pmpm formula = payment × utilization / 12,000

Next adjust 2000 utilization and redevelop the pmpm capitation.

	Payment Table MC-7 for Hospital ID 1	Utilization Change in utilization from Table MC-4	Pmpm
Medical	$1,200 / day	65 days / 1000* =70–5 (115–120 days)	$6.50
Surgical	$1,500 / day	55 days / 1000* =60–5 (85–90 days)	$6.88
Psyche	$0 (not covered)	N/A	$0.00
Substance Abuse	$600 / day	2 days / 1000	$0.10
Maternity	$2,200 / case	13 cases / 1000	$2.38
SNF	$600 / case	0.5 cases / 1000	$0.03
Total			$15.88

*The change in utilization is assumed to all come from Hospital ID 1 from the question. Table MC-4 gives the differences in utilization between 1999 and 2000, therefore, the change in days would be the change for Hospital ID1 except for Psyche.

Solution # 14 – Continued

The proposed capitation of $15.50 is below the estimated 2000 pmpm of $15.88 after adjusting for the expected reductions in utilization. A capitation below $15.88 may not be acceptable to Hospital ID 1. Capitations should reflect reasonable expectations of cost per service and utilization.

(c) Anticipated 2000 reimbursement: assume stable membership (equal to 1999)

1999 membership = 80,000 + 130,000 = 210,000 (from Table MC-3)

= average monthly membership

Anticipated 2000 reimbursement = $15.50 x 210,000 x 12 = $39,060,000

1999 reimbursement = $17.01 x 210,000 x 12 = $42,865,200

2000 adjusted for utilization change = $15.88 x 210,000 x 12 = $40,017,600

Year	Capitation	Total Dollars	Difference from 1999
1999	$17.01	$42,865,200	
2000 adjusted	$15.88	$40,017,600	$2,847,600
2000 proposed	$15.50	$39,060,000	$957,600
Total Change			$3,805,200

Based on adjusted utilization, the reduction in revenue to Hospital ID1 from the 1999 level is $2,847,600. The proposed capitation of $15.50 is an additional $957,600 reduction for a projected total reduction of $3,805,200. This is a significant reduction of revenue to Hospital ID 1.

Solution #15

(a) Develop the pmpm Withhold settlement

Target = $38.00
(Table MC-8 for IPA 1 and restated in question)

1999 cost = $40.00
(from question)

Withhold = 10% × $40.00 = $4.00
(10% from MC-8 for IPA 1)

Excess over target = $40.00 - $38.00 = $2.00

Withhold to be returned to IPA 1 = $4.00 - $2.00 = $2.00

(b) To determine the PCP and SCP costs for IPA 1, first need to solve for IPA 1 costs based on total cost information provided in the case study. The percentage of members using each IPA is found in Table MC-5. The reimbursement fee schedule is found in Table MC-7. The average cost of $13.85 for PCPs and $66.49 for SCPs is from Table MC-5.

PCP Development:

PCP costs: 95% of members use IPA 1 paid at 120% of RBRVS
5% of members use IPA 3 paid at 150% of RBRVS

Solve for PCP costs given the average cost = $13.85 (Table MC-5)

Let X = IPA 1 PCP cost, then

$0.95(X) + 0.05(X)(150\% / 120\%) = \$13.85 \rightarrow X = \$13.68$

Similarly for SCP development:

45% of members use IPA 1 paid at 120% of RBRVS
40% of members use IPA 2 paid at 135% of RBRVS
15% of members use IPA 2 paid at 150% of RBRVS

Solve for SCP costs given the average cost = $66.49 (Table MC-5)

Let Y = IPA 1 SCP cost, then

$0.45(Y) + 0.40(Y)(135\% / 120\%) + 0.15(Y)(150\% / 120\%) = \$66.49 \rightarrow Y = \$61.14$

Solution #15 -- Continued

(c) General considerations associated with calculating reserves for physician services when a risk sharing arrangement is involved includes:

- Conservatism in reserves is important but should be balanced with need for best estimate IBNR
- For risk based payments, liabilities are based on claims experience versus target
- Experience should be based on incurred claims as of the valuation date for risk based payments
- Examine stop loss provisions for offsets to provider liability

(d) Concerns to discuss with CFO include:

- $40 value from the IPA is only a paid value, not an insured value. There is a potential for other claims to come in.
- What are the reasons behind the adverse experience?
- Is the group treating sicker individuals?
- Need to discuss adequate reimbursement for next year.

Solution #16:

First determine the average wholesale price (AWP) for drugs.

Calculate 1999 cost = (17,400,000 + 33,800,000)/(80,000 + 130,000) = $243.81 pmpy (from Table MC-3).

Drug Cost = (ingredient cost + dispensing fee + admin fee – rebate – copay) × no. of scripts

Let AWP = average wholesale price for brand drugs

Based on information provided:

	Generic	Formulary Brand	Total
Percent scripts (from question)	40%	60%	100%
Scripts/member/year	2.88 =7.20 × 0.40	4.32 =7.20 × 0.60	7.20 Table MC-4 & question
Ingredient Cost based on brand AWP	0.7 × AWP	AWP	
Discounted Ingredient Cost (Table MC-7)	(0.7 × AWP) × 0.6	AWP × 0.9	
Dispensing Fee (Table MC-7)	$2.00	$2.00	
Admin Fee (Table MC-7)	$0.50	$0.50	
Rebate (Table MC-7)	$0.75	$0.75	
Copay	$3.00	$8.00	
Net cost pmpy (from above)			$243.81

Solution # 16 – Continued

Solve for AWP from above information:

$$\$243.81 = (0.6 \times (0.7 \times \text{AWP}) + 2.00 + 0.50 - 0.75 - 3.00)$$

$$\times 2.88 + (0.9 \times \text{AWP} + 2.00 + 0.50 - 0.75 - 8.00) \times 4.32$$

➔ Brand AWP = \$53.84

Next, project to year 2000 based on information provided. The 2000 AWP = 1999 AWP × 1.1. Let AWP = 1999 Brand AWP as above.

	Generic	Formulary Brand	Non-Formulary Brand
Percent scripts (see question)	40%	55%	5%
Scripts/member/year (7 scripts pmpy from question and use Table MC-4 to allocate)	2.80	3.85	0.35
Ingredient Cost based on AWP trended 10%	0.7 × AWP × 1.1 = \$41.46	AWP × 1.1 = \$59.22	AWP × 1.1 = \$59.22 (53.84 × 1.1 = 59.22)
Discounted Ingredient Cost (see question)	(0.7 × AWP × 1.1) × 0.6 = \$24.88	(AWP × 1.1) × 0.8 = \$47.38	(AWP × 1.1) × 0.8 = \$47.38
Dispensing Fee (Table MC-7)	\$2.00	\$2.00	\$2.00
Admin Fee (Table MC-7)	\$0.50	\$0.50	\$0.50
Rebate	\$0.75	\$0.75	\$0.00
Copay	\$3.00	\$8.00	20%

	Generic	Formulary Brand	Non-Formulary Brand
Net cost pmpy (from above)	$(24.88 + 2.00 + 0.50 - 0.75 - 3.00) \times 2.80 = \$66.16$	$(47.38 + 2.00 + 0.50 - 0.75 - 8.00) \times 3.85 = \$158.35$	$(47.38 + 2.00 + 0.50) \times (1 - 0.2) \times 0.35 = \$13.97$

Total projected cost pmpy = $66.16 + 158.35 + 13.97 = \$238.48$ pmpy

Total projected cost pmpm = $238.48 / 12 = \$19.87$

Solution #17

(a) Use Hospital ID2 reimbursement schedule found in Table MC-7 to determine claim costs before reinsurance.

- Large claim costs:

  Claim #1: 1 day × \$1,800 + 82 days × \$1,200 / day = \$100,200

  Claim #2: 1 day × \$4,000 + 131 days × \$1,500 / day = \$200,500

  Claim #3: 1 day × \$1,800 + 49 days × \$1,200 / day = \$60,600

- Reinsurance Recovery under the current deal:

Claim #1: (100,200 – 50,000) × 0.7 =	\$35,140
Claim #2: (200,500 – 50,000) × 0.7 =	\$105,350
Claim #3: (60,600 – 50,000) × 0.7 =	\$7,420
Total Recoveries =	\$147,910

- Reinsurance Recovery under the proposed deal:

Claim #1: (100,200 – 75,000) × 0.9 =	\$22,680
Claim #2: (200,500 – 75,000) × 0.9 =	\$112,950
Claim #3: (60,600 – 75,000) × 0.9 =	\$0
Total Recoveries =	\$135,630

- Financial impact:

  The current deal results in \$12,280 more recoveries for the Bedford Group and is financially better than the proposed deal. The reinsurance premium rate is the same under both the current and proposed deals so there is no financial benefit from either.

Solution # 17 – Continued

(b) General considerations for evaluating the need for reinsurance include:

- Meet capital requirements or increase financial capacity
- Stabilize earnings or legal requirements to have a sound financial plan
- Protect against large claims:
  - Large HMOs do not seek reinsurance
  - Bedford is not large, therefore they should keep their reinsurance
- A plan to avoid insolvency
- Review hospital contracts:
  - Per diems are better than percent off billed charges
- Management's philosophy of risk
- May give away profits to reinsurer
- Get expertise from reinsurer
- Growth in POS will increase out-of-network claims
- Out-of-network feature makes it more difficult to estimate reinsurance premium
- POS increases need for reinsurance
- Need better out-of-network contracting/negotiations, especially for percent of billed hospitals
- Reinsurer may pay less on out-of-network cliams versus in-network claims
- Large out-of-network penalty should apply in benefit plan
- Use pre-cert or large case management to control large out-of-network claims

Solution #18

(a) Traditional Medicaid programs, where providers are reimbursed fee-for-service, have experienced significant increases in costs. Programs have faced limited state financial resources and a lack of budget predictability in future costs.

Other problems with FFS Medicaid include the low provider payment rates and the resulting restrictions on provider access due to low provider participation in the Medicaid program.

The lack of care coordination in unmanaged Medicaid programs has the following challenges:

- Reliance on the high cost of the hospital emergency department as a major source of primary care.
- Episodic care
- Absence of routine, continuing first-contact medical care and preventive medicine.
- An absence of a primary care physician (along with the practice of doctor-shopping).
- Social/sociomedical challenges that impact access to care (e.g., transportation).
- No care management
- Poor quality of care

(b) Medicaid eligibility classifications include Aid to Families with Dependent Children (AFDC), Supplemental Security Income (SSI), children covered by federally mandated expansion, institutionalized, and state-funded medically needy and medically indigent residents.

Intermittent eligibility for benefits (e.g., due to income fluctuations) leads to discontinuity in coverage and service use.

Managed care Medicaid programs can be implemented using either mandatory or voluntary enrollment. Under mandatory enrollment, individuals that don't enroll in a managed care program are assigned to a plan (default enrollment).

Voluntary programs are susceptible to biased selection dynamics – by enrolling low-cost beneficiaries as high cost persons remain in traditional Medicaid or PCCM programs.

The AFDC population is more similar to commercial HMO members and thus more acceptable to health plans, and mandatory enrollment.

The Medicaid population differs from traditional commercial members with a greater need to educate beneficiaries of their choices, multi-language and multi-cultural needs, difficulties in tracking address changes, and high enrollment costs.

The enrollment challenges have led some states to select independent enrollment borkers or benefits counselor contractors to manage the process on behalf of the state. There have also been controversial efforts to regulate the marketing behavior of Medicaid managed care plans.

(c) Rating factors would include eligibility classification or aid category (AFDC/TANF, blind, disabled, aged, ...), age, sex, region, carve-outs (or benefit design), and level of stop loss.

(d) Health plans should consider the following issues in their provider contracting:

- Capitation as a means of contracting.
- Many states have implemented Primary Care Case Management (PCCM) programs as an initial step toward managed care.
- Safety net providers have a tradition of taking care of Medicaid patients.
- Maintaining the continuity of existing Medicaid providers will avoid disruptions in ongoing care.
- Certain providers (such as FQHCs and RHCs) receive special consideration for inclusion and fee levels.
- Attention to Ob/Gyn/Pediatric physicians due to the high percentage of women and children.
- Low provider payments in traditional Medicaid, which is the basis for the capitation paid to health plans.
- Access to providers – both geographic and hours (24 hour, or enhanced hours).
- Providers that can address the language and cultural needs of this population.
- Federal regulations that effectively limit the amount of risk to physicians to 25%, and place additional requirements on the health plan regarding stop-loss insurance and member surveys.
- State Medicaid programs have operated under a federal requirement that their payments to capitated health plans may not exceed the expected fee-for-service equivalent costs.

Solution #19

(a)

	Case Management	Disease Management
Goals	Cost control	Improve long-term outcome
Care	Streamline components	Integrate components
Ability to bear risk	Lacks ability	Improved ability
Member target	One with more than one condition	One with a particular disease
Caregivers	Generalists, usually nurses	Specialists, part of a multi-disciplinary team
Practice guidelines	Externally imposed	Internally designed
Monitoring	Periodic	Prospective and concurrent
Focus	High-risk, high-cost, usually inpatient, on treatment	Prevention and education, common and chronic outpatient condition
Data sources	Non-integrated, from inpatient stay	Integrated, from all points of care

(b) Criteria for selecting targeted diseases for the disease management program include:

- High cost
- High volume
- Outpatient focus, low technology condition, non-surgical condition
- Has discrete episode coding boundaries
- Frequent referrals to specialists
- High rate of patient noncompliance with treatment regime
- Practice guidelines exist or can be created
- Can show results in short time frame (1-3 years)
- There can be agreement on quality care and what to measure
- High variability in treatments
- Examples include asthma, diabetes, AODS, cancer, and CHF.

Solution # 19 – Continued

(c) Ways HMO *X* can reduce ER costs include:

- Increased hours for physician – the ER may be used as primary care and increased hours may reduce ER over-utilization.
- Require authorization – can be from a nurse-advice line or PCP. Will help reduce unnecessary ER visits.
- Require ER co-pay/cost sharing (usually waived if admitted) – deters members from using ER unless true emergency. Educate members on proper ER use.
- Contract with hospitals – reduce cost of each ER visit.
- Know the employers – helps in understanding why costs are what they are and may illustrate an avenue for cost reduction.

Solution #20

(a) Primary Care pmpm
Withhold = 10% of primary care budget = 10% ($15.00) = $1.50
Budgeted capitation payment less withhold = $15.00 - $1.50 = $13.50 pmpm

Specialty Care pmpm = 5,719 × $82 / 12,000 = $39.08
Surplus (deficit) = $40.00 - $39.08 = $0.92
Primary care risk share = 50% ($0.92) = $0.46 pmpm

Hospital pmpm
Inpatient = 277 × $1,638 / 12,000 = $37.81
Outpatient = 473 × $322 / 12,000 = $12.69
Surplus (deficit) = $50.00 - (37.81 + 12.69) = ($0.50) pmpm

Withhold payment = Withhold -Deficit = $1.50 - $0.50 = $1.00

Final compensation = Initial payment + Share of Surplus + Withhold payment
= $13.50 + $0.46 + $1.00 = $14.96

(b) Capitation – prepayment of service on a per-member, per-month basis.
- Rating variable = age/gender, geographic, practice type
- May cover primary care or may be full risk capitation
- May include withholds and/or bonus pools
  - Withholds provide for cost overruns of refer and institutional services
  - Bonus pool surpluses shared at end of year with physicians.

Fee-for-service – physicians paid for actual services performed
- Payment may be based on: usual, customary, and reasonable charges discount of billed charges relative value scale, or negotiated schedule.
- Payments may be volume-based: sliding scale fee allowances mandatory reduction in fees.