GH ADV Model Solutions
Fall 2016

1.

Learning Objectives:
1.   The candidate will understand how to evaluate the effectiveness of traditional and leading edge provider reimbursement methods from both a cost and quality view point.

Learning Outcomes:
(1a)   Calculate provider payments under standard and leading edge reimbursement methods.

(1b)   Evaluate standard contracting methods from a cost-effective perspective.

(1c)   Describe the credentialing and contracting process for providers.

Sources:
Essentials of Managed Health Care, Ch. 4, pages 68-70

Essentials of Managed Health Care, Ch. 5

Commentary on Question:
Overall, candidates performed well on this question for parts a) – c). See section d) for commentary related to that section.

Solution:
(a)   Describe the credentialing process for physicians.

  Commentary on Question:
  Candidates did well on part A if they demonstrated a thorough understanding of the credentialing process. Incomplete responses or responses lacking in detail received partial credit. Responses that failed to demonstrate an understanding of the process received no credit. Candidates should not have regurgitated the list in part B but rather explained the intent of credentialing.

  Credentialing of physicians initially happens during physician recruiting. The health plan reviews and validates a variety of information about the physician, including any past sanctions or disciplinary actions. The process can utilize self-reported data, but primary sources should be verified. In addition, the health plan will continuously monitor the physicians for disciplinary actions, changes in licensure, member complaints, and compliance with utilization review policies/programs.

1. **Continued**

(b)   List elements of a typical credentialing application.

Commentary on Question:
Candidates performed well on this section of the question

- Demographics, licenses, other identifiers
- Education, training, specialties
- Practice details
- Billing/remittance information
- Hospital privileges
- Professional liability insurance
- Work history and references
- Disclosure questions
- Supporting documentation

(c)   Calculate the Per Member Per Month (PMPM) cost for each of the following contract arrangements. Show your work.

    (i)   50% discount off billed charges for all service categories

    (ii)   Capitation of physician services at 105% of professional charges combined with a bundled payment for facility and medical supplies and equipment charges set at 80% of charges

    (iii) 60% discount off billed charges for professional and medical supplies and equipment charges combined with a $2,500 per diem charge for facility services

Commentary on Question:
Some candidates used allowed dollars instead of billed dollars for the calculations, where the intent was to determine the allowed under the proposed arrangement. Additionally, some candidates used the ALOS (average length of stay) in parts I or II but the length of stay is not relevant to these proposed reimbursements.

    (i)   Billed/claim = $10,000+$1,500+$6,000 = $17,500
         $17,500 *30 claims / 12,000 MMs = $43.75 billed PMPM
         $43.75 * 50% = $21.88 PMPM

    (ii)   Professional capitation = 105% * $6,000 * 30 / 12,000 = $15.75
         Bundled payment for facility & supplies = 80% * ($10,000 + $1,500) * 30
         / 12,000 = $9,200 * 30 / 12,000 = $23.00
         Total = $15.75 + $23.00 = $38.75 PMPM

1. **Continued**

       (iii)   Prof/supplies = (1-60%)*($6,000 + $1,500) * 30 / 12,000 = 40% * $7,500 * 30 / 12,000 = $7.50
                    Facility = $2,500/day * 1.8 days/case * 30 / 12,000 = $11.25
                    Total = $7.50 + $11.25 = $18.75 PMPM

(d)   Describe three risks to the MCO for each of the following types of contracts:

       (i)   Global capitation of professional services

       (ii)   Global capitation of all in-network services

       (iii)   Per diem rates for facility charges

Commentary on Question:
On average, candidates demonstrated the impact on quality / withholding of services that may occur within capitation arrangements and how per diem charges incent longer lengths of stay. However, a majority of candidates did not list other effects of the arrangement other than these. Additionally, some candidates focused on the risks from the provider's perspective when the question asked about the MCO's vantage point.

       (i)   **Global capitation of professional services**
- Providers can use more expensive facilities if no control or consideration of facility use when credentialing
- If certain services/providers are carved-out, physicians may abuse ability to send/refer outside the scope of the capitation arrangement
- The MCO may not receive complete information on claims/services provided

       (ii)   **Global capitation of all in-network services**
- Provider at financial risk – if the provider becomes insolvent, the MCO will need to pay other providers to provide covered care (that was expected to be covered by the capitation payments)
- Providers could send expensive/complex care out of network and not realize any financial downside/penalty
- Need adequate covered population to ensure compensation fairly reflects mix of services/intensities

1.   Continued

    (iii)   **Per diem rates for facility charges**
- Does not control utilization/total cost – facilities could extend stays
- If supplies/equipment not included in per diem, facility could increase those charges to recover lost revenue
- Need adequate covered population to ensure compensation fairly reflects mix of services/intensities (i.e. actual and expected costs for the facility will not differ too much)

2. **Learning Objectives:**
2.   The candidate will understand how to evaluate and apply techniques for claims utilization, disease management, and population health.

Learning Outcomes:
(2a)   Describe, compare and evaluate care management programs and interventions.

(2c)   Describe operational issues in the development of a study including acceptable methods for dealing with the issues.

(2e)   Describe value chain analysis as it applies to the planning and management of disease management and other intervention analysis.

Sources:
Duncan, 2nd Edition, Chapters 3, 4, 6, 8-10

Commentary on Question:
Few candidates were able to answer this question completely. Most candidates performed well on the first two parts of the question, but many candidates struggled with the last two parts of the question. Candidates who read and understood the source material performed well on all parts of the question.

Solution:
(a)   Compare and contrast disease management and population health management programs.

      Commentary on Question:
      Most candidates performed well on this part of the question. Full credit was given to candidates who were able to identify two similarities and two differences. Partial credit was awarded otherwise.

      Similarities:
- Both are forms of member intervention in that they educate the member with information to help them manage their condition(s).
- Both aim to improve quality of care and reduce claims costs.
- Both empower the member to take control of their own health.

      Differences:
- DM generally focuses on a target list of specific chronic diseases whereas Population Health Management focuses on the "whole person" irrespective of their condition(s).
- DM focuses on the management of chronic conditions whereas Population Health Management emphasizes wellness, prevention, or early detection of disease.

2. **Continued**

(b) Identify questions to ask during the predictive modeling, intervention development, and outreach and enrollment stages of the value chain method when implementing a care management program.

Commentary on Question:
Most candidates received some credit on this part of the question. Full credit was given to candidates who were able to list 2-3 questions for each stage given of the value chain method

Predictive Modeling
- Is the data clean/adjusted?
- Which risk factors are we looking at to identify/prioritize members?
- What stratification approach does the predictive model use?
- Is the predictive model accurate/valid?

Intervention Development
- What diseases should be covered?
- What is the objective of each intervention type?
- What is the evidence basis/clinical best practices for the intervention type?
- What process exists to graduate a member?

Outreach and Enrollment
- How are targets identified for the program? What is the number of targets initially identified?
- How many members are identified for initial and subsequent outreach? How many attempts are made to reach members? What is the expected reach rate? What is the expected enrollment rate?
- What is the expected contact rate? What process is used to increase the contact rate? What other outreach and enrollment tools are employed (e.g. auto-dialer, etc.)?
- What process to outreach to members is employed?

(c) For each of the following areas of care management evaluation:

- Economics of Care Management Programs
- Risk-Adjustment and Predictive Modeling
- Financial Outcomes Evaluation

(i) Explain how actuaries are involved.

(ii) Describe tools actuaries use

2.   **Continued**

Commentary on Question:
Candidates who read and understood the source material performed well on this part of the question. Full credit was given to candidates who clearly explained the involvement of actuaries in each area of care management evaluation and provided an example of one or more tools used in each area. Partial credit was awarded otherwise.

Economics of Care Management Programs
(i)   Actuaries can help in understanding the relationship between inputs and outputs, i.e. the appropriateness of the level and volume of clinical resources to the savings or outcomes of the program.
(ii)   Total savings, ROI, or Net Savings
        Risk Management Economic Model – method for planning care management programs by assessing the potential economic return from a proposed intervention or program
        Opportunity Analysis – focuses attention on discriminating between high-utilizing or high-opportunity members and other high cost or high risk members that may represent a lesser opportunity

Risk-Adjustment and Predictive Modeling
(i)   Actuaries can use risk adjustment and predictive model processes to compare different populations and provide insights on where to devote clinical resources.
(ii)   Propensity scoring – risk-adjustment technique used for assessing program outcomes

Financial Outcomes Evaluation
(i)   Actuaries can help bridge the gap between program outcomes and the overall trend in health plan costs. When measuring the financial outcomes of an intervention program, what is being measured is something that did not occur.
(ii)   Control group methods: randomized control group methods, temporal methods, pre-post cohort ("patient as their own control") method, participant vs non-participant studies
        Non-control group methods: services avoided methods, clinical improvement methods
        Statistical methods: time series methods, regression discontinuity, benchmark methods

2. **Continued**

(d)   Critique the vendor's assertion.

Commentary on Question:
Few candidates performed well on this part of the question. Many candidates attempted to calculate a savings value, although the question did not require a calculation. Full credit was given to candidates who demonstrated an understanding of selection bias as illustrated in Duncan, Chapter 4. Partial credit was awarded to candidates who identified other concerns relevant to the vendor's assertion, but failed to mention selection bias.

The vendor asserts that their CM program will save $3M over a one-year period if 1,000 members participate in their CM program. This equates to $3,000 PMPY, roughly the difference between the control group and the participant group over the 12-month post-intervention time period. Comparing the participant group and the control group is not appropriate because of inherent selection or enrollment bias, i.e. members less severely ill may be more in control of their own care and therefore more willing to engage in a program. It is, therefore, more appropriate to compare the intervention group with the control group.

Additional concerns relevant to the vendor's assertion may include the following:
- It is unclear whether the savings estimate provided by the vendor is trend-adjusted.
- There is no indication of whether the control and intervention groups are comparable or have been propensity score matched.
- It is unclear whether the data contain sufficient run-out to be credible.

3.   **Learning Objectives:**

4.   The candidate will understand how to apply principles of pricing, benefit design and funding to an underwriting situation.

Learning Outcomes:

(4b)   Understand, evaluate and apply various risk adjustment mechanisms.

(4c)   Recommends strategies for minimizing or properly pricing for risks.

Sources:
Financial Reporting Implications Under the Affordable Care Act Section I & IV

Commentary on Question:
This question tested the candidates understanding of the three risk mitigation programs under the ACA: Risk Adjustment, Reinsurance and Risk Corridor. Most candidates were able to correctly answer parts of the question.

Solution:

(a)   For the three risk mitigation programs created under the Affordable Care Act (ACA):

(i)   Describe each program.

(ii)   Create a chart summarizing the markets to which each program applies.

(iii)   Create a chart summarizing who is responsible for the administration of each program.

Commentary on Question:
Most candidates were able to describe the programs, but had difficulty with the administration. Additionally most candidates did not include the applicability of the programs for Grandfathered plans.

(i)   Risk Adjustment is a permanent program that applies to the Individual and Small Group markets, both in and out of the exchange. It is designed so that carriers that have lower than average risk pay into the pool while carriers that have higher than average risk receive money from the pool.

Reinsurance is a three year program from 2014-2016 that provides reimbursement to carriers in the Individual market for large claims. It is funded through an assessment on all self-funded groups, insured employer groups, and Individuals.

3. Continued

Risk corridor is a three year program from 2014-2016. The risk-corridor mechanism calls for payments from the issuer to HHS if actual experience is more than 3 percent below a target, and payments from HHS to the issuer if actual experience is more than 3 percent above the target. The amount of the payment is 50 percent of the amount between +/-3 percent of the target and +/-8 percent of the target and 80 percent of the amount that is +/-8 percent of the target.

(ii)

ACA Provision	Sold within the Exchange		Sold Outside Exchange		
	Individual	Small Group	Individual	Small Group	Grandfathered
Risk Adjustment	Yes	Yes	Yes	Yes	No
Reinsurance	Yes	No	Yes	No	No
Risk Corridor	Yes	Yes	No	No	No

(iii)

ACA Provision	Who administers	
	State Run Exchange	Federal Run Exchange
Risk Adjustment	State or HHS	HHS
	State can decide if HHS	
	all parameters will be Federal	
Reinsurance	State	State or HHS
		State can decide if HHS
		all parameters will be Federal
Risk Corridor	HHS	HHS

(b)

(i) Calculate the expected transitional reinsurance payment as originally prescribed for 2014. Show your work.

(ii) Calculate the percent increase in reinsurance payments that you expect to receive under the revised 2014 program parameters. Show your work.

Commentary on Question:
Few candidates knew both the original parameters for 2014 and the final 2014 parameters that are needed to complete this question.

3. Continued

(i) Original program was 80% between $60,000 and $250,000

Member	Paid Claims	Subject to Reinsurance	80% Reinsurance
A	$65,000	Max($65,000 - $60,000,0) = $5,000	80% x $5,000 = $4,000
B	$80,000	$20,000	$16,000
C	$48,000	$0	$0
D	$0	$0	$0
E	$25,000	$0	$0
F	$170,000	$110,000	$88,000
G	$325,000	$250,000 - $60,000 = $190,000	$152,000
H	$55,000	$0	$0
I	$72,000	$12,000	$9,600
J	$15,000	$0	$0
			$269,600

(ii) The final parameters of the transitional reinsurance program were 100% of claims between $45,000 and $250,000

Member	Paid Claims	Subject to Reinsurance	100% Reinsurance
A	$65,000	Max($65,000 - $45,000,0) = $20,000	100% x $20,000 = $20,000
B	$80,000	$35,000	$35,000
C	$48,000	$3,000	$3,000
D	$0	$0	$0
E	$25,000	$0	$0
F	$170,000	$125,000	$125,000
G	$325,000	$250,000 - $45,000 = $205,000	$205,000
H	$55,000	$10,000	$10,000
I	$72,000	$27,000	$27,000
J	$15,000	$0	$0
			$425,000

Percent increase in reinsurance payments = $425,000 / $269,600 = 57.6%.

(c) Describe elements of the risk-adjustment mechanism that may lead to increased uncertainty in your year-end financial statement.

Commentary on Question:
Most candidates knew this material.

3. **Continued**

1) **Uncertainty as to the issuer's risk score** – because the risk adjustment mechanism is based on concurrent analysis, the issuer will not have all of the data at year end that will ultimately be used to calculate its own risk score.
2) **Uncertainty as to other issuers' risk score** – the payment or receivable is dependent on the issuer's risk score relative to market average risk and so will not have this data by year end either.
3) **Uncertainty as to member exposure** – there is some uncertainty as to year-end membership due to 90 day grace periods.
4) **Granularity of the calculation** – This level of granularity will complicate the modeling required to perform effective estimates of risk adjustment balances.
5) **Implications of data reviews** – Data validation reviews occur after the year and could lead to payment adjustments.

(d)

(i)   Calculate the percent of premium paid or received for 2014 from the risk pool by each issuer and identify if it was a payment or receivable.

Show your work.

(ii)   Construct three scenarios for your relative risk score for 2016.

Show your work.

(iii)   Describe the considerations for determining a premium deficiency reserve (PDR) in this situation.

(iv)   Recommend whether or not the risk score should be considered in the PDR calculation. Justify your answer.

Commentary on Question:
For section (ii) the solution shows three possible scenarios. These are not the only possible scenarios. As long as the candidate developed three scenarios which showed various outcomes and they calculated the solutions correctly, they were accepted. Likewise for (iv), the solution shows one possible solution.

(i)

Issuer	Market Share	Risk Score	Relative Risk Score	Outcome
A	70%	1.25	1.016 = 1.25 / 1.230	Receives 1.6% of Prem
B	20%	1.20	0.976 = 1.20 / 1.230	Pays 2.4% of Prem
C	10%	1.15	0.935 = 1.15 / 1.230	Pays 6.5% of Prem
Total	100%	1.23		

1.230 = 70% x 1.25 + 20% x 1.20 + 10% x 1.15

3. **Continued**

(ii)

1) **Scenario #1 - Assumes average risk score from 2014 and 2015 for companies B and C.**

Company	2014 Risk Scores		2015 Risk Scores		2016 Risk Scores	
	Raw	Relative	Raw	Relative	Raw	Relative
A	1.25	1.04	1.25	0.99	1.25	1.01
B	1.20	1.00	1.30	1.03	1.25	1.01
C	1.15	0.96	1.25	0.99	1.20	0.97
Average					1.23	1.00

Company A receives 1% of premium.

2) **Scenario #2 - Assumes risk score trends from level out from 2015 to 2016 for companies B and C.**

Company	2014 Risk Scores		2015 Risk Scores		2016 Risk Scores	
	Raw	Relative	Raw	Relative	Raw	Relative
A	1.25	1.04	1.25	0.99	1.25	0.99
B	1.20	1.00	1.30	1.03	1.30	0.98
C	1.15	0.96	1.25	0.99	1.25	0.94
Average					1.27	1.00

Company A pays 1% of premium.

3) **Scenario #3 - Assumes risk score trends from 2014, 2015 to 2016 for companies B and C.**

Company	2014 Risk Scores		2015 Risk Scores		2016 Risk Scores	
	Raw	Relative	Raw	Relative	Raw	Relative
A	1.25	1.04	1.25	0.99	1.25	0.94
B	1.20	1.00	1.30	1.03	1.40	1.05
C	1.15	0.96	1.25	0.99	1.35	1.01
Average					1.33	1.00

Company A pays 6% of premium.

3. **Continued**

    (iii)   Premium deficiency reserves are typically established for financial reporting purposes. A gross premium valuation is completed in order to determine whether or not a deficiency exists.
Items to consider when calculating a premium deficiency reserve include:
.

a. Exposure—Consider reasonable increases and decreases in membership which should reflect changes due to mortality, lapses, and the impact of expected premium rate changes.
b. Premium Rate Changes— This assumption should take into account factors such as market conditions and regulatory restrictions.
c. Claims Trend—Consider changes in provider agreements, adverse selection due to premium rate increases and plan design, and other factors that affect future claim payments.
d. Risk-Sharing Arrangements—Take into account risk sharing arrangements such as provider agreements.
e. Interest Rates—Use interest rates in the present value calculation that are reasonable.
f. Reinsurance—Consider the expected effects of reinsurance.
g. Taxes—The premium deficiency calculation includes the impact of taxes.
h. Expenses—Need to see if other blocks of business can cover the overhead expenses.

    (iv)   I recommend including the Risk Adjustment in the Premium Deficiency Reserve. According to ASOP 42, all areas that impact premium need to be considered when setting a premium deficiency reserve

4.   **Learning Objectives:**
2.   The candidate will understand how to evaluate and apply techniques for claims utilization, disease management, and population health.

Learning Outcomes:
(2a)   Describe, compare and evaluate care management programs and interventions.

Sources:
Program Measurement and Evaluation Guide for EHM (pages 19 – 24)

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)   Describe options for methodologies measuring the directly monetized metric used to evaluate savings of EHM programs.

   Commentary on Question:
   Candidates in general responded with the major bullet items. Fewer candidates included details supporting each item. Additional credit was given to candidates who included those details.

   1) Adjusted-expected compared to actual cost trend
      a. Actual and expected are decomposed into components.
      b. Components include demographic, risk, price per unit, etc.
   2) Chronic versus Non-chronic trend comparison
      a. Often used for DM programs. Not applicable to other programs.
      b. Key assumption is that absent EHM or DM, chronic and non-chronic has same trend.
   3) Participant versus non-participant cost comparison
      a. Key assumption is that cost trajectories (or trend) would be the same absent EHM. Non-participant trend is used to create expected cost of participant.
   4) Comparison with matched controls in a non-exposed population
      a. This is the most rigorous metric other than the "gold standard."
      b. Uses a population not exposed to EHM, but with similar characteristics. Assuring characteristics are similar is key to success of this.
   5) Cost trend compared with industry peers
      a. Recommended only for relatively large organizations with access to a database of peer trends.
      b. Because most large companies have implemented EHM, it is becoming very challenging to use this methodology in many industries.

4. **Continued**

(b) Describe the characteristics of a "gold standard" for measuring monetized savings including the implementation challenges.

Commentary on Question:
Most candidates struggled in responding to this question. There were a broad range of answers provided by candidates. Partial credit was given for identifying implementation challenges even if the candidate did not correctly identify the gold standard.

- The gold standard is based on randomizing people to EHM or no EHM.
- Requires 25,000.
- Rarely feasible because employers want EHM to apply to an entire population.

(c) Calculate the 2015 PMPM savings from the EHM program for XYZ.

Show your work.

Commentary on Question:
Majority of the candidates did well on this calculation and described the equations.

- Calculate trend for industry peers
  ($320/$300 = 6.7%)
- Calculate expected 2015 PMPM based on industry peer trend
  ($310 x 1.06667 = $330.67)
- Calculate savings
  Savings = Expected PMPM compared to Actual PMPM
  ($330.67 - $325 = $5.67)

(d) Describe safeguards for improving the validity of the savings calculation.

Commentary on Question:
Candidates struggled to answer this question completely. A lot of candidates wrote to factors affecting trend being similar between XYZ and peer groups but missed on the number of members, assuming peer groups did not have EHM and it would be preferable to have multiple years of data.

- This metric needs 25,000 members.
- It is assumed the peer groups do not have an EHM program.
- It is assumed that other factors that affect trend are similar to peer group.
  o In other words, there are no demographic or other changes that contributed to the trend differential.
- It would be preferred to have several years of data.

5.

Learning Objectives:
1. The candidate will understand how to evaluate the effectiveness of traditional and leading edge provider reimbursement methods from both a cost and quality view point.

Learning Outcomes:
(1a) Calculate provider payments under standard and leading edge reimbursement methods.

(1c) Describe the credentialing and contracting process for providers.

Sources:
Essentials of Managed Health Care, Kongstvedt, 6th Edition, 2013
- Ch. 4 The Provider Network

GHA-102-13: Evaluating Bundled Payment Contracting

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Describe aspects of provider contracting ABC should consider.

Commentary on Question:
The most common answer that did not receive credit was listing different aspects (such as "size of network") without providing a description of the aspect.

- ABC should consider the following:
  - Contract terms
    - ABC needs to consider the cost/discount level it can negotiate with providers
    - ABC should limit carve-out and stop-loss provisions in order to minimize its risks
  - Covering a large enough variety of services
    - ABC needs a comprehensive network or the product won't be competitive, or ABC may pay high OON claims
  - Covering the appropriate geographic area
    - What is the area in which an adequate network is necessary? This will impact where a product can be marketed/sold.
  - Member disruption
    - Members have established relationships with providers and won't be happy if they have to change providers

5. **Continued**

(b) Recommend characteristics for each aspect from (a) above that ABC should incorporate. Justify your recommendations.

Commentary on Question:
The most common responses that did not receive credit were lists of different types of networks and descriptions of the provider credentialing process. Candidates needed to recommend specific characteristics (consistent with the response to part a), and explain why these are desirable.

- Contract terms
  - ABC should prioritize contracting with providers who are receptive to including quality/efficiency in the payment calculation – particularly those who recognize and are working towards reducing costs and providing optimal care.
  - ABC should make sure the contract terms satisfy its financial targets and achieve enough of a difference in cost vs. its current offering to provide a compelling value proposition to customers.
- Covering a large enough variety of services
  - ABC should contract a comprehensive network, but focus on narrowing choices for practice areas with a number of available providers and wide differences in practice patterns. ABC also should make sure the contracted physicians use / refer to in-network hospitals.
- Covering the appropriate geographic area
  - ABC should target an urban area with a high level of provider competition. This will ensure it has a sizable population to market the product to, and will also have adequate network coverage but for a differentiated, selective network of providers.
- Member disruption
  - This is a new product, so disruption is not a concern. However, ABC should make sure there is strong alignment between facilities and physicians so the member experience is not adversely impacted.

5.   Continued

(c)   Describe financial, operational, and quality issues specific to bundled payment contracts.

>   **Commentary on Question**:
>   *Candidates typically received all of the points for this question, or received very few points. A well prepared candidate knew the appropriate source material to pull this information from, while an unprepared candidate typically went to an unrelated area of the syllabus.*

- Defining the episode – must be clearly defined as it defines contractual obligations. This would include defining the trigger date, when the case ends, and which services are included.
- Evaluating catastrophic risk – bundled payments reflect an average per patient cost but few cases are average. An outlier risk analysis that includes a classical stop loss analysis can evaluate and adjust for the financial risk to the sponsoring organization.
- Financial stability for low caseloads – random fluctuations are greater for provider groups with low caseloads and could lead to average case mix that is significantly different than the average assumed in the bundled rate.
- Determining provider allocation of funds – the bundled rate negotiated between providers and payers is typically lower than the total the payer would have spent piecemeal, which means some combination of more efficient care, lower-expense care, and retaining more care within the system is necessary for a provider to maintain current profit margins.
- Distinguishing case severity – consider excluding the highest-severity patients or adopting stop loss provisions so the bundled payment does not need to address an unreasonably large amount of variation in necessary care.
- Quality outcome requirements – quality may be compromised if providers reduce needed services to reduce expenses.

5. Continued

(d) Calculate a bundled payment contract rate such that 99% of the experienced claims cost is covered. Show your work.

Commentary on Question:
The original goal of this question was to not only calculate a payment rate for the contract, but to identify which services (comprising at least 99% of total costs) would be included in the bundle. The question did not specifically ask to identify services included in the bundled payment, so candidates that calculated the 99th percentile of the average total costs ($16,541) received full credit for this question.

	Member 1		Member 2		Member 3		Average				
	Visits	Total Costs	Visits	Total Costs	Visits	Total Costs	Visits	Cost/Visit	Total	Rolling Sum	% of Total
Pre Op Visits	2	$240	4	$360	3	$300	3	$100	$300	$300	1.8%
Surgery Performance	1	$10,000	1	$9,000	1	$8,000	1	$9,000	$9,000	$9,300	55.7%
Implant	1	$7,500	1	$5,500	1	$5,000	1	$6,000	$6,000	$15,300	91.6%
Rehab	1	$500	2	$1,200	2	$800	1.67	$500	$833	$16,133	96.6%
Post Op Visit 30 days	2	$395	3	$420	4	$400	3	$135	$405	$16,538	99.0%
Post Op Visit 60 days	1	$100	2	$150	2	$150	1.67	$80	$133	$16,672	99.8%
Post Op Visit 90 days	0	$-	1	$50	1	$60	0.67	$55	$37	$16,708	100.0%

The total average cost for these episodes, including all services, is $16,708 (summing the final column). By including everything through the Post Op Visits – 30 days, you get $16,538, which is 98.98%. The recommendation is to include everything through Post Op visits, 60 days at a contracted rate of $16,672 or less.

6. **Learning Objectives:**

3. The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:

(3a) Describe the types of claim reserves (e.g., due and unpaid, ICOS, IBNR, LAE, PVANYD).

(3b) Explain the limitations and applications of the various valuation methods.

(3c) Calculate appropriate claim reserves given data.

(3e) Evaluate data resources and appropriateness for calculating reserves.

(3f) Describe, calculate and evaluate different types of reserves and explain when each is required.

Sources:
Individual Health Insurance, Ch. 6

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)

    (i) Describe types of financial statements ABC needs to produce.

    (ii) Explain how reserves should be incorporated within each statement.

Commentary on Question:
This question tested a candidate's ability to recall applicable financial reporting for U.S. Health and Canadian Disability insurance. Candidates generally performed well on this section of the question.

1. Statutory Statement
   a. Purpose is to demonstrate solvency, so reserves are conservative
   b. According to standards set by each state -- NAIC Orange blanks

2. GAAP Statement
   a. Focus on matching profit streams with revenue streams, so reserves reflect "best estimate"
   b. Reserves may have provision for adverse deviation
   c. Solvency is a secondary concern
   d. Regulated by FASB

6. **Continued**

     3. Tax Statement
        a. Internal Revenue Service set standards such that profits beyond a certain level are recognized immediately
        b. Reserves will therefore be less conservative

     4. Embedded Value Statement
        a. According to accounting standards set by the IASB and codified in the International Financial Reporting Standards
        b. Reserves considered in in mergers and acquisitions

(b) List and describe types of reserves and liabilities included on the balance sheet.

Commentary on Question:
To receive full credit, a response must have addressed several categories of reserves and provided descriptions of each. Many candidates performed well while others earned partial credit for focusing primarily on types of claims and/or premium reserves.

- Premium Reserves
  - Unearned premiums – set aside portion of premium that has been received for coverage which has not yet occurred as of the valuation date
  - Premiums paid in advance
    - When premium paid is more than what is required for the current renewal period as of the valuation date
    - E.g., when monthly premium due January 1st is paid in late December
  - Premium due and unpaid – limit to smaller of 90 days past due or one modal premium
- Claim Reserves
  - Incurred prior to the valuation date but not reported as of the valuation date
  - Processed as of the valuation date but not yet paid
  - Seriatim case reserves
  - Outstanding accounting feed
  - Claims under litigation
  - Present value of amounts not yet due for long-duration claims
- Expenses
  - Loss Adjustment Expenses
  - Deferred Acquisition Costs
  - Taxes
- Premium deficiency reserve
  - When the present value of future liabilities is less than the present value of future premiums
  - For a specific block of policies (rather than an insurer's entire business)

6.   Continued

- ACA-compliant reserves for
  - Risk-adjustment
  - Risk corridors
  - MLR rebates
  - Reconciliation of various government subsidies
- Reserves for contracts with providers
  - Withholds
  - Bonuses
  - Other pay-for-performance arrangements
  - Risk-sharing mechanisms
- Reserves for contracts with employers
  - Experience refunds
  - Accounting feeds receivable
- Reserves specific to Government Plans
  - Medicare Supplement refund reserves
  - Medicare Part D risk-sharing reserves
  - Special Medicaid reserves

(c)

(i)   Calculate the IBNR claims reserve using the triangulation method. Show your work.

(ii)   List adjustments to the Triangulation Method that could lead to alternative claims reserve results.

Commentary on Question:
The majority of candidates received partial credit for(c)(i) by calculating the IBNR based on age-to-age factors. Many candidates also received partial credit for calculating that IBNR based on the assumption that January completion factors were representative of all incurred months.

A variety of adjustments and other methodologies were given credit for Part (c)(ii).

6. **Continued**

(c)(i)

Paid Claims

		Incurred Month					
		Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15
Paid Month	Jan-15	$900					
	Feb-15	$650	$1,000				
	Mar-15	$350	$1,100	$800			
	Apr-15	$125	$700	$400	$700		
	May-15	$50	$400	$100	$400	$1,200	
	Jun-15	$20	$200	$400	$200	$900	$800

Cumulative Paid Claims

		Incurred Month					
		Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15
Paid Month	Jan-15	$900					
	Feb-15	$1,550	$1,000				
	Mar-15	$1,900	$2,100	$800			
	Apr-15	$2,025	$2,800	$1,200	$700		
	May-15	$2,075	$3,200	$1,300	$1,100	$1,200	
	Jun-15	$2,095	$3,400	$1,700	$1,300	$2,100	$800

Completion Ratios

		Incurred Month					
		Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15
Paid Month	Jan-15	0.581					
	Feb-15	0.816	0.476				
	Mar-15	0.938	0.750	0.667			
	Apr-15	0.976	0.875	0.923	0.636		
	May-15	0.990	0.941	0.765	0.846	0.571	
	Jun-15	1.000					

CompletiCompletion Factors

		Incurred Month					
		Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15
Paid Month	Jan-15	0.430					
	Feb-15	0.740	0.291				
	Mar-15	0.907	0.612	0.439			
	Apr-15	0.967	0.816	0.658	0.384		
	May-15	0.990	0.932	0.713	0.603	0.345	
	Jun-15	1.000	0.990	0.932	0.713	0.603	0.345

6. **Continued**

	Incurred Month						
	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Total
Ultimate	$2,095	$3,433	$1,824	$1,824	$3,482	$2,321	$14,978
Paid	$2,095	$3,400	$1,700	$1,300	$2,100	$800	$11,395
IBNR	$0	$33	$124	$524	$1,382	$1,521	**$3,583**

(c)(iii)
- Averaging the completion ratios attributable to a given month of payout (using a variety of averaging methods)
- Averaging the completion factors used to calculate ultimate incurred claims (using a variety of averaging methods)
- Developing and using seasonality factors
- Smoothing techniques
- Basing triangulation on different lag data (e.g., PMPM claims, weekly claims, number of services, number of claims)
- Employing projection method or loss ratio method for recent months, perhaps by credibility-weighting

(d) Explain why the past claims run out pattern may not be representative of the future pattern.

Commentary on Question:
A variety of reasons were given credit for Part (d) and most candidates earned credit for responding to Part (d). Extensive lists lacking explanations were considered for full credit in addition to thorough explanations.

- Claims administration – payment mechanism changed to or from electronic claims submission, change in claims administration IT systems, change in workflow, including claims department staffing, holidays, and vacation, changes to adjudication process
- Seasonality – lag report contained only six months of data, accumulation of deductible and other cost-sharing parameters over the course of a year, flu season, number of service days and processing days
- Change in the level of claim backlog during historical period
- Changes in benefits and plan design
- Changes in mix of services and/or risk profile of covered population
- Large claims

6. **Continued**

(e) Calculate the IBNR claims reserve for April, May, and June using the loss ratio method using the ultimate claims results for Q1 2015 from Part (c). Show your work.

Commentary on Question:
Candidates generally performed well on Part E. To earn full credit, an average loss ratio needed to be calculated based upon the candidate's results from Part (c)(i) and multiplied by April, May, and June premiums to estimate ultimate incurred claims. Claims paid to-date were subtracted from ultimate incurred claims to estimate the IBNR associated with April, May, and June incurred months. A small number of candidates did not recall the loss ratio method.

	Jan-15	Feb-15	Mar-15	Average Loss Ratio
Premium	$3,500	$3,750	$3,750	
Paid	$2,095	$3,400	$1,700	
Ultimate (from part c)	$2,095	$3,433	$1,824	
MLR	59.9%	91.5%	48.6%	**66.7%**

	Apr-15	May-15	Jun-15	Q2 Totals
Premium	$4,000	$4,500	$5,000	$13,500
Paid	$1,300	$2,100	$800	$4,200
Ultimate (66.7% x Premium)	$2,667	$3,000	$3,334	$9,001
IBNR (Ultimate - Paid)	$1,367	$900	$2,534	**$4,801**

7. **Learning Objectives:**
2. The candidate will understand how to evaluate and apply techniques for claims utilization, disease management, and population health.

Learning Outcomes:
(2b) Estimate savings, utilization rate changes and return on investment as it applies to program evaluation.

Sources:
Chapter 1 Managing and evaluating healthcare intervention programs – also chapter 8 appendix

Commentary on Question:
Overall, candidates did very well on this question. The math was straightforward and most people seem to have a general understanding of plausibility factors.

Solution:
(a) Calculate each program's net savings. Show your work.

Commentary on Question:
Candidates did well on this part of the question. Common mistakes were made when using unit cost, not using the correct membership, and getting confused when converting to PMPMs or Util/1000.

- Net Savings = Programs savings – Program Costs
  - o Utilization Per 1000 = (Units/Membership)*1000
  - o Trended Utilization = (Util Per 1000) *(1+Trend)
  - o Reduced Admissions due to program = Program Util/1000 – Trended Util/1000
  - o Program Savings = Reduced Admits*Allowed Per Unit(Program Year)
  - o Program Costs = Program Costs PMPM * Membership * 12

	Baseline admits/1000	Program Year admits/1000	Trended Admits/1000	reduced admits	gross savings	program costs	net savings
Diabetes	500	490	500	10	9,900,000	8,640,000	1,260,000
Pulmonary Disease	500	520	525	5	650,000	300,000	350,000
Heart Failure	100	101.7647059	106	4.235294118	3,600,000	3,060,000	540,000
Asthma	200	185	208	23	644,000	840,000	(196,000)

7. Continued

(b)   Describe the theory of plausibility factors.

Commentary on Question:
Candidates mostly got the second bullet point, but not the first. Needed both bullet points for full credit.

- The theory of plausibility factors is that they independently validate the measured financial results of a care management savings calculation.
- It does this by demonstrating actual utilization is reduced by the intervention.

(c)   Explain why plausibility factors may be a poor indicator of DM program savings.

Commentary on Question:
Candidates did very well on part C. Other answers were accepted besides those listed below, but the answer below would have gotten full credit.

- The admissions are only used on primary diagnoses codes and therefore only account for a very small % of total units and may not imply lack of success with other types of utilization for the same disease state
- The risk profile of the population is not considered
- It doesn't take into account the volatility of admissions rates
- Utilization trends are ignored

(d)   Calculate the plausibility factor for each program. Show your work.

Commentary on Question:
Results were mixed on Part D. Some candidates seemed to understand what plausibility factors were, but couldn't calculate them.

- Plausibility Factor = Disease State Util Per 1000 Program Year/Disease State Util Per 1000
- Using Base Year U/1000 and Program Year U/1000

7. **Continued**

Table Below

	Base Year U/1000	Program Year U/1000	Plausibility Factor
Diabetes	500.00	490.00	0.98
Pulmonary Disease	500.00	520.00	1.04
Heart Failure	100.00	101.76	1.017647059
Asthma	200.00	185.00	0.925

(e) Recommend whether or not TMNT should continue each program.

Justify your answer.

Commentary on Question:
Candidates did okay on Part E. Based on information in part C candidates were not supposed to use the value of the plausibility factor as a deciding factor, but rather use the net savings value to make their recommendation.

Diabetes, COPD, and HF are all positive net savings, but only Diabetes is validated. Plausibility factor is relatively useless in this case though as described in part C – population changes happen as well as trend and general volatility of claims. Diabetes, COPD, and HF programs should all be continued. Asthma program should not be continued.

8. **Learning Objectives:**

1.   The candidate will understand how to evaluate the effectiveness of traditional and leading edge provider reimbursement methods from both a cost and quality view point.

Learning Outcomes:

(1e)   Evaluate the effectiveness of pharmacy benefit manager on controlling costs and providing quality care.

Sources:

Kongstvedt Chapter 11

Commentary on Question:

Commentary listed beneath question component.

Solution:

(a)   Describe utilization and formulary management programs that reduce total pharmacy costs, including negative impacts these programs may have on plan participants.

        Commentary on Question:

        Overall candidates did well on this part of the question. Candidates who did not receive full credit typically did not address the negative impacts the programs could have on plan participants, or simply listed programs without providing an adequate description.

        Step therapy – Members are required to use lower cost alternatives prior to being eligible for more expensive treatments. Negative impact: members may be dissatisfied with being required to take non-prescribed alternatives, or initial step medications may prove ineffective.

        Drug utilization review – Program that is intended to identify and correct inappropriate or unsafe drug utilization patterns and identify opportunities for cost reductions (such as generic substitution). Plan participants may be dissatisfied with barriers to receiving prescribed medications, or dissatisfied with substitution suggestions/requirements.

        Closed formulary – A formulary that excludes specific medications, often based on cost or efficacy. Plan participants may react negatively to prescribed medications not being covered on the formulary, resulting in greater out-of-pocket costs.

        Dispensing limitations – Limits on the quantity/duration of supply permitted to be dispensed, or the requirement that a pharmacy receive prior authorization prior to dispensing. Plan participants may react negatively to delays in receiving prescriptions or the need for additional refills/trips to the pharmacy.

8. **Continued**

(b)   Describe how the current benefit design may contribute to high plan costs.

Commentary on Question:
Candidates who did not receive full credit typically did not comment on the differential in the retail generic and brand copayments and/or the mail order coinsurance.

1. The differential in the retail generic and brand copayments is insufficient to encourage generic substitution, resulting in a lower generic dispensing rate and a higher plan cost.
2. The 2-tier design does not provide an incentive for members to choose preferred brands over non-preferred brands, when preferred brands are generally less costly for the plan.
3. The mail order coinsurance design is both confusing and potentially more costly for members, failing to encourage members to use the mail distribution channel, which is less expensive for the plan.
4. The current benefit design is unmanaged, lacking utilization management programs and missing opportunities for plan savings.

(c)   Explain how the proposed plan design promotes more cost-effective drug utilization.

Commentary on Question:
Overall candidates performed well on this part of the question.

1. The differential in the retail generic and brand copayments has increased, providing greater incentive for members to choose generic prescriptions when available.
2. The 3-tier copayment structure encourages members to choose preferred over non-preferred brands, reducing plan costs.
3. The mail order benefit is more clearly defined, and represents a 2x multiple of the retail copayment. Since most mail order prescriptions are for a 90-day supply, participants have an incentive to fill at mail order instead of paying three retail copayments.
4. The proposed plan includes utilization management programs, which may prove both cost-effective and clinically beneficial.

9.

Learning Objectives:
4.   The candidate will understand how to apply principles of pricing, benefit design and funding to an underwriting situation.

Learning Outcomes:
(4a)   Understand the risks and opportunities associated with a given coverage, eligibility requirement or funding mechanism.

Sources:
GHA-104-15: Actuarial Aspects of Employer Stop Loss

Commentary on Question:
Candidates generally did well on this question. Some confused rating considerations with underwriting considerations.

Solution:
(a)   Describe underwriting considerations for:

      (i)   Specific Stop-Loss

      (ii)   Aggregate Stop-Loss

Commentary on Question:
Many candidates included rating considerations rather than underwriting ones.

(i) Specific Stop-Loss
Underwriting large known losses
    Techniques used to identify large known losses:
        Identify via year-to-date policy/claims info
        Require notification of identification of potential large loss
        Require disclosure statement
    Approaches to evaluate the risk a given loss presents to the SL policy:
        Request an APS regarding the known loss
        Refer the loss to a medical professional skilled at assessing the likely future costs of a known conditions
    Actions taken when an identified loss will have a material effect in the upcoming year:
        Rating the policy up for the known loss
        Setting a separate SSL deductible for the known loss (i.e. lasering).
        Exclude the known loss from coverage.
Block management
    Aggregate info for credibility

9. Continued

        Sold-to-manual ratios
            Compare to manual rate, note variations from the manual
            Considerations when setting SSL rate:
                How often the plan sponsor switches SL insurers
                Whether or not the SSL deductible is appropriate for the plan
                Whether the producer has an established track record of success with the insurer
                SSL rate history
                Historical SSL experience
    (ii) Aggregate stop-loss UW considerations
        Aggregate margin factor
            Higher margin for smaller plans
        Specific stop-loss deductible
            Plans with higher specific stop-loss deductibles are more volatile than those with smaller deductibles
            Plan's specific stop-loss deductible should fall w/in a range of 5-15% of aggregate losses

(b)   Describe steps to set aggregate attachment factors based on past claims experience.

Commentary on Question:
Candidates who didn't get at least 4 out of the 9 steps did not receive any credit. Most candidates listed at least 4.

1. Obtain running 12-month paid losses for one, two, three years depending upon the number of certificates and the availability of data.
2. Adjust the paid losses of each running 12-month period for specific stop loss reimbursement.
3. Divide by the number of certificates covered by the plan in each running 12-month period to calculate losses paid PEPM.
4. Adjust for any plan design differences between the experience periods and the period to which the aggregate attachment factors will apply.
5. Trend the losses PEPM from the midpoint of each running 12-month period to the midpoint of the period to which the aggregate attachment factor will apply.
6. Calculate weighted average trended losses PEPM.
7. Blend weighted average trended losses PEPM with annual losses PEPM.
8. Adjust for contract type.
9. Multiply by the aggregate margin factor (e.g. 125%).

9. Continued

(c)   Calculate the reimbursed losses under each quote using the 2014 experience for:

(i)   Specific Stop-Loss

(ii)   Aggregate Stop-Loss

Show your work.

Commentary on Question:
Almost all candidates calculated part (i) correctly. Most didn't get full point on part (ii), some from not calculating the minimum attachment point; others from not using the max between the minimum and the aggregate attachment factor times the actual certificate months.

	Plan 1	Plan 2
Actual certificate-months	11,875	11,875
Total losses	$84,621,250	$84,621,250
(i) Specific SL reimbursements	$1,800,000	$1,575,000
Eligible aggregate losses	$82,821,250	$83,046,250
Minimum attachment point	$82,920,750	$79,151,625
Aggregate attachment point = Max(minimum attachment point, aggregate attachment factor x actual certificate months	$90,131,250	$86,034,375
(ii) Aggregate reimbursement	$0	$0
Total SL reimbursement	$1,800,000	$1,575,000

(d)   Recommend whether or not Moonraker should pursue Stop-Loss coverage. Justify your response.

Commentary on Question:
No credit was given if a candidate did not make a clear recommendation. Half credit was given to candidates who showed little justification, which was most. Full credit was given for complete and thought out justification of the recommendation, including benefits of pursuing stop loss coverage. Candidates who received full credit provided a variety of acceptable answers. Below is an example.

9. **Continued**

It is recommended for Moonraker to pursue stop loss coverage. Specific stop loss protects the employer from adverse volatility in the severity of losses per person. Aggregate stop loss protects the employer from adverse volatility in the frequency of losses. Stop loss coverage will reduce the amount of risk in moving from fully to self-insured. Moonraker has a number of existing high cost claimants. Specific stop loss will guard against a truly catastrophic claimant. With respect to aggregate stop loss, even though the 2014 experience didn't result in any reimbursement, it's important to understand that 2014 claims are not necessarily indicative of future experience. Aggregate stop loss would help mitigate large unknown changes in the trend, such as provider reimbursement changes and technology advancements.

10. **Learning Objectives:**
2. The candidate will understand how to evaluate and apply techniques for claims utilization, disease management, and population health.

Learning Outcomes:
(2f) Apply the actuarially adjusted historical control methodology.

Sources:
Managing and Evaluating Healthcare Intervention Programs, 2nd Edition, Ian Duncan

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Describe requirements of a valid DM evaluation methodology.

Commentary on Question:
Generally, candidates did well on this question. Full credit was awarded for getting the majority of the points listed below. Additional responses, such as equivalence between populations and use of a reference population, were given partial credit as well.

- Must have scientific rigor necessary for an academic study
- The methodology must be one that a purchaser is familiar with, and perceived in the marketplace as sound
- Methodology must be documented in sufficient detail for another practitioner to replicate the study
- The results must be consistent with the client's savings expectations, and plausible
- The application should lead to stable results over time
- Methodology must be practical – i.e cost effective

(b) Describe control group methodologies that could be used to evaluate a DM program.

Commentary on Question:
Candidates generally did well on this section. Full credit was awarded if candidates listed the majority of the methods below with reasonable descriptions. Descriptions needed to be provide detail on the concerns, use or implementation of the method to receive full credit.

- Randomized – comparing equivalent samples drawn randomly from the same population, the gold standard but difficult to implement
- Geographic – comparing equivalent populations in two different locations; adjustments should be made to account for differences in the market

10. Continued

- Temporal – compares equivalent samples drawn from the same population before and after the intervention. The most commonly used method
- Product Control Method – compares samples drawn from the same population in the same point in time, but with different products. Adjustments need to be made to account for differences in plan designs
- Patient as their own control – different from temporal in which the intervention and comparison populations are sampled in each period to ensure equivalence. Subject to regression to the mean
- Participant vs. Non Participant – experience of those who voluntarily elect to participate in compared with those who don't participate. Subject to self-selection bias

(c) For propensity scores

(i) Describe their purpose.

(ii) Explain the approach used to calculate them.

Commentary on Question:
This question was a differentiator among candidates. Many confused p-values, which are a test of statistical significance, with propensity scores. Many candidates also gave overly mechanical or technical responses, describing little more than the mathematics of propensity scores but failing to describe the purpose, value or full approach to implement propensity scores. This question was intended to evaluate a candidates understanding of how to use propensity scores, not complex arithmetic.

i. A propensity score is a composite variable that summarizes multiple characteristics inherent in a population into a single variable, allowing you to match on a score rather than directly on the characteristics. This helps to solve the equivalence problem of evaluating a DM program
ii. The following process is used to calculate propensity scores
    a. Run logistic regression to create the score
        i. Logit function usually used since the predicted outcome is binary.
    b. Match each participant based on propensity score
        i. Target member matched to comparison member based on different methods. Methods include
        ii. Nearest Neighbor – first member of the comparison with the closest propensity score is selected, and should be done randomly
        iii. Caliper Matching – match is made if the member and match's scores are within a fixed distance

10. Continued

    iv. Mahalanobis Metric Matching – the Mahalanobis distance is a metric that can be used to measure the dissimilarity between two vectors

    v. Stratification Matching – observations are stratified and match by stratum

  c. Test the Results

    i. Model should be tested for appropriateness and bias.

(d)   Evaluate

(i)   The propensity matched and unmatched DM results from Exhibit 9.

(ii)   Whether or not the program was successful based on the propensity matched results.

Justify your response.

Commentary on Question:
This section created mixed results. Many candidates confused p-values and propensity scores. Others commented solely on the p-values and impact of the matching and not on the impact of the DM program. Candidates were expected to comment on both the unmatched and matched results, the statistical significance of the measures and provide a statement on the success of the program

The unmatched program indicated some success, lowering admit/1000, cost per admit, cost per heart failure admit and raising compliance heart meds. However, the results are mixed as heart failure admit/1000 is higher than in the indexed population. The p-values indicate that the results are not statistically significant for at least two of the measures, so the results of the unmatched study are at best inconclusive.

The propensity matched results are much clearer. All measures are statistically significant at the $p < .05$ level, indicating that they are most likely the result of the DM program and all measures show an improvement in outcomes.

Based on the propensity matched results, the DM program appears to be successful, and the improved outcomes are most likely the result of the intervention.

11.

Learning Objectives:
3.   The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:
(3a)   Describe the types of claim reserves (e.g., due and unpaid, ICOS, IBNR, LAE, PVANYD).

(3c)   Calculate appropriate claim reserves given data.

Sources:
Group Insurance, Bluhm, 6th Edition, Ch. 43 Claim Reserves for Long-Term Benefits, pages 718-721

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)   Describe studies for evaluating LTD claim reserve adequacy.

Commentary on Question:
Most candidates identified the two types of studies found in the text. To receive full credit, candidates needed to provide some depth in their descriptions of the studies.

- Runoff Studies: Previous reserve balances are compared to subsequent payments and reserve balances
- A/E Claim Termination Rate Studies
  o Compares actual claim terminations experienced by a company to expected claim terminations.
  o A/E ratios of greater than 1 indicate more claims are terminating than assumed in reserve basis, meaning reserve basis is adequate.
- Special Considerations
  - Credibility
  - Types of terminations included
  - Exposure Characteristics
  - Voluntary Claim Settlements

11. Continued

(b)

    (i)   Calculate the open claim reserves using both the new and old valuation tables at the end of:

- month 9
- month 18
- month 27

Show your work.

    (ii)   Explain the quantitative and qualitative drivers of the change in reserve balances.

Commentary on Question:
Almost all candidates successfully calculated the open claim reserves using both the new and old valuation tables. Many candidates struggled with explaining the quantitative and qualitative drivers of the change in reserve balances.

    (i)   Open Claim Reserves Using the New Tables – Exhibit 12 in the Case Study for a 40 year old male with a 6 month elimination period:
$V_9 = 6,000 \times 61.38 = 368,280$
$V_{18} = 6,000 \times 75.45 = 452,700$
$V_{27} = 6,000 \times 84.07 = 504,420$

Open Claim Reserves Using the Old Tables – Exhibit 14 in the Case Study for a 40 year old male with a 6 month elimination period:
$V_9 = 6,000 \times 83.44 = 500,640$
$V_{18} = 6,000 \times 98.19 = 589,140$
$V_{27} = 6,000 \times 107.15 = 642,900$

    (ii)   *There were a couple of approaches that could be taken to this question. Full credit was given for thoroughly exploring how the new reserves differ from the old reserves, by addressing why long term disability claim reserves in general may change over time, or by talking about how reserves change by different durations.*

Examples of possible answers include:
Quantitative drivers
- Claim termination rates in the new table are higher
- The new tables were developed internally so are more reflective of the actual experience of Thunderball – perhaps the old tables were based on a more general population or nationwide factors

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11. **Continued**

- Assumptions used in the old tables may have changed over time – interest rates (higher interest rates require less initial reserves), morbidity, population mix (demographics, disability type)

Qualitative drivers

- Better data available to the internal team
- Underwriting could be more robust with the new tables
- Better care management and medical technologies allow claims to be terminated sooner due to recoveries.
- Reserves by duration are impacted due to improved medical treatment allowing claimants to stay on claim longer, but still remaining disabled and receiving claim payments.
- Current economic conditions can impact LTD claims – when the economy is performing poorly, claimants tend to stay on disability longer.
- Definition of disability may have changed (may be dictated by Federal Government)
- Social Security offsets may have changed
- The duration that a claimant is on disability impacts the probability that they will remain on disability – e.g. someone disabled for 27 months is more likely to remain disabled compared to someone disabled for only 6 months.

Proportional changes in reserves:

The old reserves as a proportion of the new reserves are larger in the near term and converge as the duration increases:

Old V_9 / New V_9 = 83.44 / 61.38 = 136%

Old V_{18} / New V_{18} = 98.19 / 75.45 = 130%

Old V_{27} / New V_{27} = 107.15 / 84.07 = 127%

This seems to indicate that the greatest change, whether quantitative or qualitative, had a larger impact in the near-term than for the longest duration claimants.

12.

Learning Objectives:

1. The candidate will understand how to evaluate the effectiveness of traditional and leading edge provider reimbursement methods from both a cost and quality view point.

Learning Outcomes:

(1a) Calculate provider payments under standard and leading edge reimbursement methods.

(1d) Understand accountable care organizations and medical patient home models and their impact on quality, utilization and costs.

(1f) Describe quality measures and their impact on key stakeholders.

Sources:
GHA-110-15 Commonwealth Fund Paper – The Final Rule for the Medicare Shared Savings Program

Measurement of Quality and Efficiency: Resources for Health Care Professionals

Commentary on Question:
This question tested the candidate's ability to calculate shared savings, as well as to demonstrate an understanding of quality performance measures and programs in place to improve quality.

Solution:

(a) List the domains CMS uses to group quality performance measures.

Commentary on Question:
Many candidates were able to list most or all of the performance measure domains.

1. Patient/Caregiver experience
2. Care coordination/Patient safety
3. Preventive Health
4. At-risk population

(b) List two measures within each domain in part (a).

Commentary on Question:
Very few candidates received full credit on Part b. The most common responses included "Patient's rating/surveys" and "EHR", while few other items were mentioned. While the answer below would receive full credit, there were a number of other measures that could have been provided in place of the ones listed below.

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12. Continued

    1. Patient/Caregiver experience
       a. How well your doctors communicate
       b. Access to specialists
    2. Care coordination/Patient safety
       a. Risk-standardized, all-condition readmissions
       b. Percent of all PCPs who qualify for an electronic health record (EHR) incentive program payment
    3. Preventive Health
       a. Depression screening
       b. Proportion of adults age 18+ who had blood pressure measured in the past 2 years
    4. At-risk population
       a. Diabetes mellitus: hemoglobin A1c
       b. Hypertension: blood pressure control

(c)   List four of these programs.

Commentary on Question:
Most candidates responded with "Bundled Payments", "Dual Eligible", and "PQRS". Four programs needed to be listed to receive full credit. There are a number of additional programs that could have been listed to receive credit.

- Bundled Payments for Care Improvement
- Dual Eligible – State Demonstrations
- Medicare Quality Improvement Organization (QIO) program
- Physician Quality Reporting System (PQRS)

(d)   Calculate the 2015 claims cost that would result in $0 shared savings over the two years. Assume the 2015 quality performance score is 80%. Show your work.

Commentary on Question:
Many candidates did well on this part. One common mistake was made when comparing the 2014 pmpm to 2015, because there were different member months in both years. Partial credit was given in this case.

2014 actual claims PMPM = 515,400,000 ÷ (50,000 x 12) = 859
2014 benchmark - 2014 actual claims PMPM = 2014 savings PMPM = 96
2014 savings PMPM x quality performance score x shared savings % = 2014
       shared savings PMPM
          = 96 x 80% x 50% = 38.40 PMPM
2014 shared savings = 2014 member months x 2014 shared savings PMPM =
       $23,040,000

12. Continued

To find the 2015 claims cost that would result in 0 savings/losses over the two-year period, we need to find the 2015 claims cost that generates a loss of (23,040,000).

(23,040,000) = 2015 shared losses PMPM x 2015 member months = 720,000X
X = 2015 shared losses PMPM = (23,040,000) ÷720,000 = (32)
2015 shared losses PMPM = 2015 losses PMPM x quality performance score x
      shared losses %
      Shared losses % = 1 - (shared savings %) x (quality performance
      score) = 1 - 80% x 60% = 52%
2015 shared losses PMPM = 2015 losses PMPM x 52% = (32)
      2015 losses PMPM = (32) ÷ 52% = (61.54)
2015 claims PMPM = 2015 benchmark - 2015 savings/losses = 1010 - (61.54) =
      1071.54 PMPM
2015 total claims cost that generates a loss of (23,040,000) = 1071.54 x 720,000 =
      $771,508,800

(e)   Calculate the impact to shared savings over the two years if the 2015 quality performance score increases to 100%. Show your work.

Commentary on Question:
Partial credit was given when an incorrect answer from Part D was used to calculate Part E.

2015 losses PMPM = (61.54) PMPM
2015 shared losses PMPM = 2015 losses PMPM x shared losses %
Shared losses % = 1 - (shared savings %) x (quality performance score) = 1 - 100% x 60% = 40%
2015 shared losses PMPM = (61.54) x 40% = (24.62) PMPM
2015 shared losses = (24.62) x 720,000 = (17,726,400)
Savings/losses over the 2-year period = 23,040,000 + (17,726,400) = **$5,313,600 savings**

13. **Learning Objectives:**
4.   The candidate will understand how to apply principles of pricing, benefit design and funding to an underwriting situation.

Learning Outcomes:
(4a)   Understand the risks and opportunities associated with a given coverage, eligibility requirement or funding mechanism.

(4b)   Understand, evaluate and apply various risk adjustment mechanisms.

(4c)   Recommends strategies for minimizing or properly pricing for risks.

Sources:
Individual Insurance, Ch. 4

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)   Differentiate:

- ACA-compliant and non-ACA-compliant policies
- on-exchange and off-exchange policies

Commentary on Question:
- *In order to get the maximum points allowed on this question, candidates must have listed the major items of the model solution.*
- *Most candidates did well in that part of the question.*
- *Candidates that did not score well in that part of the question are those that did not list the items of the model solution.*

Differentiate ACA-compliant and non-ACA-compliant policies
- Other than new start-ups, most insurers will have both ACA-compliant and non-compliant policies on their books.
  - o   The ACA-compliant policies may either be on-exchange or off-exchange.
  - o   The non-compliant-ACA policies may be either grandfathered or transitional.

13. Continued

- By ACA-compliant plans, we mean those effective January 1, 2014 or later which comply with all the ACA rules, including guaranteed issue, modified community rating, and the various benefit mandates.
  - These plans may be sold either through a public health insurance exchange or directly by the insurer or its agent as in the past (off-exchange).
  - In the absence of regulation, it is possible that selection effects would occur between the on- and off-exchange blocks of business.
- The non-compliant policies also come in two flavors: grandfathered and transitional.
  - Grandfathered policies are those that were in existence when the ACA was signed on March 23, 2010.
    - If benefits or cost sharing are changed too much, these policies lose their grandfathered status.
    - New grandfathered policies cannot be sold.
    - Grandfathered plans are exempt from most (but not all) of the requirements, and by law they must be rated separately from the ACA-compliant risk pool.
  - Transitional policies (also sometimes called "grandmothered" plans) are policies that were sold after the ACA was passed, but before the major reform changes took effect in 2014.
    - Many of these policies failed to meet one or more of the ACA requirements (such as covering essential health benefits), and hence were going to be canceled.

Differentiate on-exchange and off-exchange policies.
- The ACA creates a Health Insurance Exchange (Exchange) that is intended to increase competition.
  - The Exchange is typically not thought of as a replacement to the current marketplace, but as an additional marketplace that operates next to the current marketplace.
  - One of the key characteristics of the Exchange, relative to risk adjustment, is the requirement that low income individuals who want to receive premium and cost sharing subsidies must enroll in coverage through the Exchange.
  - Consumers on exchanges can readily compare plan designs and prices for different insurers' products.
  - They also have access to "navigators" and "assisters"—counselors who can help them make decisions in their financial self-interest.
- ACA-compliant plans may be sold either through a public health insurance exchange or directly by the insurer or its agent as in the past (off-exchange).
- Under ACA regulations, a single annual open enrollment period in the individual market was established each year, and was aligned to be the same on and off of the exchanges.

13. Continued

- The ''three Rs'' programs (i.e. Risk Adjustment, Reinsurance and Risk Corridor) apply to individual policies sold through the Exchange, while the Risk Corridor does not apply to individual policies sold outside the Exchange.
  - The risk corridor program only applies to qualified health plans (QHPs) sold through a public exchange, or substantially similar plans offered by the same issuer off the exchange.

(b) List measures to control antiselection in the individual market that are prohibited under the ACA.

Commentary on Question:
- *In order to get the maximum points allowed on this question, candidates must have listed the items of the model solution.*
- *The vast majority of candidates did very well in that part of the question.*
- *Candidates that did not score well in that part of the question are those that did not list the items of the model solution.*

- Underwriting, including offering alternative coverage or denying coverage
- Health status rating
- Pre-existing condition exclusions
- Exclusionary riders
- Lifetime or annual dollar limits
- Limiting benefit coverage or imposing very high cost sharing designed to attract healthier risks
- Rescissions, except in cases of fraud or intentional misrepresentation
- Marketing practices that discourage unhealthy risks from signing up

(c) Define the requirements imposed on health plans by ACA to mitigate market-level selection risk.

Commentary on Question:
- *In order to get the maximum points allowed on this question, candidates must have listed the items of the model solution.*
- *The vast majority of candidates did very well in that part of the question.*
- *Candidates that did not score well in that part of the question are those that did not list the items of the model solution.*

- Insurers must include all ACA-compliant policies, both on- and off-exchange, in a single risk pool, meaning that identical plans must have identical rates on and off the exchanges.
- Risk adjustment also works to even out risk between insurers, and between the on- and off-exchange portions of the risk pool.

13. Continued

- Insurers must pay the same commissions to brokers and agents on and off exchanges.
- The exchange fee must be spread across the entire single risk pool, including off-exchange policies.
- Carriers participating in exchanges must offer at least one gold and one silver level plan on the exchange.
- Carriers are prohibited from marketing practices intended to discourage unhealthy individuals from signing up.
- Open enrollment periods are identical on and off the exchange.

(d)

(i)   Describe mathematical and conceptual tools used to model antiselection.

(ii)   List the assumptions required by antiselection models.

Commentary on Question:
- *In order to get the maximum points allowed on this question, candidates must have listed the major items of the model solution.*
- *Very few candidates did well in part (i) and most of candidates did very well in part (ii).*
- *Candidates that did not score well in that part of the question are those that did not list the items of the model solution.*

(i)   Describe mathematical and conceptual tools used to model antiselection.
- **The Partition Model**
  - The most commonly used basis for modeling antiselection is to partition the population and separately model the resulting subsets.
  - The partitioning of the population can be thought of as having the population under study get into a long line, starting with the highest cost person, and having monotonically descending claim levels thereafter, until, at the end of the line, is a group of people who all have zero claims.
  - Once the line-up occurs, we can partition the line-up into relatively unhealthy and healthy insureds.

13. Continued

- **The CAST Model**
  - This model is useful in modeling cumulative antiselection.
  - The average claims per insured of the unhealthy group are compared with that of the healthy group.
  - The cutoff of the line-up is chosen so that the ratio of the unhealthy to healthy average claim cost is a chosen multiple.
  - It may be necessary to choose the above multiple relatively high (like 5 to 10), for high lapse coverages such as major medical, so that even after many years there are still sufficient persisting "low" risk insureds in the model to continue to demonstrate antiselection.

- **Minnesota Antiselection Model (MNAM)**
  - That model was developed to find boundary conditions on the antiselection which might occur in a specific situation.
  - The situation was one where uninsureds in a given geographic area were to be provided an offer of guaranteed insurability.
  - In that case, there was an "envelope" developed between zero antiselection and maximum antiselection.
  - Maximum antiselection in this case would occur if every insured were fully prescient about their own future claims, if they acted fully rationally, and if higher cost people were provided the opportunity to buy coverage before lower cost people.

- **Internal Antiselection**
  - This type of model is often required when managing existing blocks of individual or small group medical business.
  - A modified CAST model can be used for this purpose, typically with a need to model each of the deductible/plan populations which will be offered the choice of new plans.
  - There are then at least two decrements to those populations-- lapsation and plan changes.
  - After the line-up and partition occur, we can choose or derive characteristics of the low risk and high risk subsets.
  - Each subset can be projected separately.
  - Assumptions must be made about relative price elasticity (and lapse rates) of the groups, as well as overall assumptions.

- **Deterministic vs. Stochastic Models**
  - A true picture of the future, including its values and its risks, requires that we work with distributions of potential values, not just the expected values themselves. These distributions are provided by stochastic models.

13. Continued

- With the number of variables involved, this type of analysis is not just difficult – it is dauntingly complex – even if we had valid distributions to represent each of the variables.
- Nonetheless, with the rapid advancement of computing power, there has been renewed interest in stochastic modeling of policyholder behavior.

- **Markov Processes**
  - There is no reason why a population partition need be limited to two subsets.
  - If further partitions are done, however, the multiple subsets can be individually modeled.
  - Typically this modeling uses identical formulas, applied to different assumptions about that subset of the population.
  - In this case, the model lends itself to being treated as a Markov process, where the population at any given point in time can be represented by a 1 N x N array, with each element of the array representing the proportion of the population in a given subset (state).
  - The Markov chain is created by repeatedly applying a linear operator (matrix) to that array, with each subsequent resulting array representing the population in the next time period.

(ii) **List the assumptions require by antiselection models.**
- Trends in claim costs
- Lapsation separately for each sub-population.
- Movement between healthy Vs. unhealthy populations
- The time value of money (interest)
- Premium rate increases

(e) Calculate the net cost or benefit of the transitional reinsurance program for each block of policies based on:

(i) Original parameters

(ii) Revised parameters

Show your work.

13. Continued

Commentary on Question:
- *In order to get the maximum points allowed in this question, the candidates must have made the correct calculations.*
- *Many candidates did well in that part of the question.*
- *Candidates that did not score well in that part of the question are those that did not make the calculations correctly.*

(i) Original parameters
- On Exchange / ACA Compliant
  - Premiums = 1,000 x $63 = $63,000
  - Benefits = 80% x ($85,000 - $60,000) + 80% x ($250,000 - $60,000) = $20,000 + $152,000 = $172,000
  - Net Benefit = $172,000 - $63,000 = $109,000

- Off Exchange / ACA Compliant
  - Premiums = 300 x $63 = $18,900
  - Benefits = 80% x ($100,000 - $60,000) + 80% x ($200,000 - $60,000) + 80% x ($250,000 - $60,000) = $32,000 + $112,000 + $152,000 = $296,000
  - Net Benefit = $296,000 - $18,900 = $277,100

(ii) Revised parameters
- On Exchange / ACA Compliant
  - Premiums = 1,000 x $63 = $63,000
  - Benefits = 80% x ($50,000 - $45,000) + 80% x ($85,000 - $45,000) + 80% x ($250,000 - $45,000) = $4,000 + $32,000 + $164,000 = $200,000
  - Net Benefit = $200,000 - $63,000 = $137,000

- Off Exchange / ACA Compliant
  - Premiums = 300 x $63 = $18,900
  - Benefits = 80% x ($100,000 - $45,000) + 80% x ($200,000 - $45,000) + 80% x ($250,000 - $45,000) = $44,000 + $124,000 + $164,000 = $332,000
  - Net Benefit = $332,000 - $18,900 = $313,100

(f)

(i) Calculate the risk corridor ratio. Show your work.

(ii) List the thresholds and sharing amounts for all possible outcomes of the risk corridor ratio.

(iii) Describe potential pitfalls to consider when calculating the risk corridor ratio.

13. Continued

Commentary on Question:
- *In part (i), in order to get the maximum points allowed in this question, the candidates must have made the correct calculations.*
  - *Very few candidates did well in part (i), but most candidates did very well in part (ii) and (iii).*
- *In part (ii), in order to get the maximum points allowed in this question, the candidates must have listed the items of the model solution.*
  - *The vast majority of candidates did very well in that part of the question.*
- *In part (iii), in order to get the maximum points allowed in this question, the candidates must have listed the items of the model solution.*
  - *The vast majority of candidates did very well in that part of the question.*

(i) **Calculate the risk corridor ratio**
- Claim costs = incurred claims + claim reserves + any payment/receipts from risk adjustment and transitional reinsurance = 3,600,000 + 500,000 + 240,000 + 210,000 = 4,550,000
- Allowable costs = claim costs + quality expenses + health care information technology = 4,550,000 + 330,000 + 360,000 = 5,240,000
- Profits = Max((premium - allowable costs - non-claim costs), 3% x after-tax premium) = Max(6,000,000 – 5,240,000 – 270,000, 3% x 6,000,000) = Max(490,000, 180,000) = 490,000
- Administrative costs = non-claim costs - taxes/fees = 270,000 – 150,000 = 120,000
- Allowable administrative costs = taxes/fees + Min(admin costs + profits, 20% x after-tax premium) = 150,000 + Min(120,000 + 490,000, 20% x 6,000,000) = 150,000 + Min(610,000, 1,200,000) = 760,000
- Target amount = premium - allowable administrative costs = 6,000,000 – 760,000 = 5,240,000
- Risk corridor ratio = allowable costs / target amounts = 5,240,000 / 5,240,000 = 100%

(ii) **List the thresholds and sharing amounts for all possible outcomes of the risk corridor ratio.**
- Below 92% of the target, the insurer pays 80% of the "gains" to the government.
- Between 92% and 97% of the target, the insurer pays 50% of the "gains" to the government.
- Between 97% and 103% of the target a mount, there is no risk corridor payment or receivable.
- Between 103% and 108% of the target, the government reimburses 50% of the "losses" to the insurer.

13. Continued

- Above 108% of the target, the government reimburses 80% of the "losses" to the insurer.

(iii) **Describe potential pitfalls to consider when calculating the Risk Corridor Ratio.**
- Profits aren't profits
    - The target amount includes a provision for profit but it often won't be the profit target the insurer was using when pricing the product.
    - The profit in the risk corridor target is subject to a floor of 3% of *after-tax* premium (of course, many insurers are used to thinking of profit as a percentage of gross premium, including taxes).
- Allowable costs aren't just claims
    - Besides the inclusion of risk adjustment, transitional reinsurance, and certain other non-claim expenses such as those related to quality improvement, there are other significant adjustments in determining allowable costs.
- Risk isn't only shared with the government
    - Through the MLR program, insurers with unexpectedly high profits must return some of those profits to policyholders through rebates.
    - To the extent these profits are first shared with the government through the risk corridor program, rebates may be reduced.
- Protection is limited
    - The risk corridor program can dampen gains and losses, but it does not eliminate them.
- Nothing is set in stone
    - There is significant political and legal uncertainty surrounding the program, including whether all payments required under the formula will actually be made.

(g) Recommend whether or not your off-exchange block should be offered on-exchange for 2016. Justify your recommendation.

Commentary on Question:
- *In order to get points in this question, the candidate must have justified whether or not the off-exchange block should be offered on exchange.*
- *Most candidates did score well in that part of the question.*
- *Candidates that did not score well are those that did not justified its rationale.*

13. Continued

- Yes, the off-exchange block should be offered on-exchange for 2016 for the following reasons:
    o The block will now be eligible for the risk corridor program.
        ▪ The risk corridor approach can help limit anti-selection, and is available only for on-exchange policies.
    o Will potentially reduce antiselection.
        ▪ Selection effects occurs between the on- and off-exchange blocks of business.
        ▪ Members can benefit from subsidies offered on-exchange plans only.
        ▪ Lower income individuals can be attracted to the exchanges by the subsidies are likely to differ in health status from the higher income off-exchange population.
    o The off-exchange block has only 300 lives and combining the two block together will increase credibility and will provides predictability for the insurer cashflows.
        ▪ Offering on-exchange has the potential to attract more members.
    o The off-exchange block has only 300 lives and including it on-exchange can help achieving economies of scale.
        ▪ It will reduce admin costs for the two different blocks.
        ▪ Combining the two blocks will create less communication and admin work.
        ▪ Exchange platform provides a marketplace for growth opportunity.

- *Note: Other candidates' answers accepted if well justified.*