GH ADV Model Solutions
Spring 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:

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

Sources:

Essentials of Managed Health Care, Kongstvedt
Ch. 11 Prescription Drug Benefits in Managed Care (p. 259, 262-273, 275)
Ch. 12 Introduction to Managed Behavioral Health Care Organizations (p.289)

Commentary on Question:

This question evaluated the candidate's basic understanding of pharmacy benefit management and modes of delivery of commercial behavioral health services. Successful responses to each question required full descriptions, and no points were given for answers which did not include sufficient explanation. Several candidates provided responses in addition to those outlined in the source material; these responses were given full credit where appropriately supported.

Solution:

(a) List future trends affecting pharmacy program management.

Commentary on Question:

Candidates were generally successful on this part, reproducing most of the list provided in the source in addition to several other reasonable influences on pharmacy program management.

- Brand name drugs losing patent protection
- Increase in number/pace of specialty drug approvals by the FDA
- Continued expansion of Medicare & Medicaid markets
- Tighter formularies
- Demographic trends (e.g. obesity, aging) driving changes in utilization and mix of services
- Legislative actions, required coverages, and ACA initiatives
- Continued development of biologics and biosimilars

1. Continued

(b) Describe prescription drug program management components.

Commentary on Question:
Many candidates appeared to misunderstand the question, focusing on clinical components of prescription drug program management. Answers did not need to be organized in the form presented in this solution, as the focus was on the actual components of program management rather than the categorization of those components. The solution provided includes more components and detail than required for full credit, but successful candidates were expected to provide similar breadth in their responses.

There are many components to management of a prescription drug program, which can be categorized as follows:

- Certificate/Evidence of Coverage: legal enforcement of the benefit design
  - Influenced by pharmacy laws and regulations
  - Legal contract between benefit purchaser and entity providing benefits
  - Specifies covered benefits, formulary, and exclusions
- Pharmacy Benefit Design: the summation of covered benefits and access rules
  - Must balance cost and quality of care
    - Allow affordable access to necessary drugs, as greater cost sharing threatens adherence
  - Open vs. Closed formularies
- Drug formulary: a dynamic list of covered drugs and access rules, designed to encourage the use of safe, effective, and affordable medications
  - Step therapies and prior authorization
  - Generics cost 75% less than brand drugs, so a 1% increase in generic utilization reduces costs by 2.5%.
  - Must consider clinical needs
  - Drugs are typically assigned to different tiers with different member cost sharing for each tier
- Pharmacy Provider Network: Drug distribution channels to provide members efficient and accurate access to covered drugs
  - 3 main channels: retail pharmacy, mail service, and specialty pharmacies
  - Must balance access and cost
  - Access standards (e.g. must have a provider within 2 miles of home or work)
  - Rebates offered for brand drugs
  - PBM may be able to obtain deeper discounts
  - Mail services generate savings by high volume and automation
    - May encourage use through financial incentives

1. Continued

  - Specialty pharmacies provide chronic and complex disease treatment
    - Have high cost and use trends
    - IV drugs are covered under medical benefit
    - Adherence concerns as cost sharing increases
    - May send injectable directly to physician's office
- Information Technology – claims processing and decision support systems
  - Must adjudicate claims accurately
  - Check member eligibility
  - Online, real time pharmacy claims processing
  - Management of many products with different formularies, cost-sharing, and tier structures
  - Converting data into actionable information for clinical management and research
  - Electronic prescribing (using computer or handheld device) reduces errors, provides timely information, and improves efficiency
  - Key consideration for ACOs and PCMHs
  - Capture all claims (including for cash) for medical histories and satisfaction of deductibles
- Clinical Elements – using medical resources to support patients and maximize outcomes
  - Drug Utilization Review programs identify and correct inappropriate utilization or patterns (may be prospective, concurrent, or retrospective)
  - Disease Management
    - Active case management for patients taking many medications
    - Drug utilization data can be used to identify patients with poorly controlled medical conditions
  - Adherence programs, including auto-refill and tracking patients who do not pick up prescriptions
  - Medication Therapy Management
    - optimize therapeutic outcomes for individual patients
    - control cost and improve quality of care
    - reduce risk of adverse events, including adverse interactions
    - target enrollees who have multiple chronic diseases

(c) Describe typical delivery system classifications of commercial behavioral health services.

Commentary on Question:
Most candidates were able to identify the different delivery systems for commercial behavioral health services, although many candidates struggled to articulate the differences between them. To receive full credit, candidates were expected to identify each delivery system clearly enough to both describe the full spectrum of services and identify where each was distinct.

1. Continued

There are six typical delivery systems classifications for commercial behavioral health services, in order of intensivity:

- Inpatient Services
  - Psychiatric and substance abuse services, usually provided in a hospital facility involving 24 hour-a-day medical and nursing care
- Residential Treatment
  - Non-hospital 24-hour care facilities that provide patients with severe mental health/substance abuse disorders a continuum of therapeutic services.
- Partial Hospitalization
  - Programs which provide structured mental health/substance abuse therapeutic services at least 4 hours per day at least 3 days per week, generally provided by a multidisciplinary team.
- Intensive Outpatient Program
  - Programs which provide structured therapeutic services for at least 2 hours per day at least 3 days per week, consisting of coordinated and integrated multidisciplinary services.
- Outpatient Treatment
  - Includes individual, family, or group treatment by a licensed professional for a specified duration including medication evaluation and monitoring, typically by a single provider (a psychiatrist or clinical nurse specialist)
- Employee Assistance Program (EAP)
  - Short term, problem focused services for employees and their families
  - Delivered in an outpatient setting and focused on finding solutions for work and personal problems, typically using a 3, 5, or 7 sessions model

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.

(2d) Perform a literature review about program evaluation.

Sources:

Managing and Evaluating Healthcare Intervention Programs, Duncan, Chapter, 9

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a)

(i) Define Opportunity Analysis for evaluating care management programs.

(ii) List components needed to perform an Opportunity Analysis.

Commentary on Question:

The majority of candidates performed well on part i however a fair number of candidates listed components in part ii that would be needed to design a care management program, not perform the analysis

(i) Opportunity Analysis is a data driven analytical process to match savings opportunities within a client's population to various care management programs. It should be economically viable, high-utilizing patients should provide an opportunity for savings through identification process, and typically retrospective data is used to prospectively to identify future

(ii) In order to perform an opportunity analysis you would need knowledge of the current member benefit design, information around any current evidence-based care management programs that are currently in place or can be put in place, and you would need at least 2 or 3 years of prior eligibility and claims data. Each of these components would be needed in order to perform the analysis and understand the implications of the care management program.

(b) Describe the strengths and weaknesses for each stratification using principles of Opportunity Analysis.

2. Continued

Commentary on Question:
The majority of candidates listed strengths and weaknesses that were related to the stratification method (i.e. a strength is that predictive risk scores provide one number for all members for comparability) whereas the strengths and weaknesses should have been described as they related to the design of a program when using the Opportunity Analysis approach (i.e. a weakness under the predictive risk score method under OA implies difficulty in producing a consistent DM program given diversity of members identified). Descriptions were required to receive full credit; merely listing strengths and weaknesses did not satisfy a complete response.

1) For the episode/chronic only stratification method, a strength would be that the resulting membership base would be less complicated (conditions would be grouped and not all members would be included) and this would lessen the administrative burden of designing the program. A weakness of the method is that these episodes are less expensive than some high risk conditions (such as HIV) so there might be less savings than desired
2) For the mental health/episodic/chronic only stratification method, a strength would be that mental health has a grave impact on the identification/management of chronic conditions so including this in the methodology could result in dramatic savings. A weakness of the method is that the design of the program would be immensely complex given mental health is usually managed by a separate vendor and data is difficult to obtain. Additionally, mental health issues are not always amenable to changes in behavior
3) For the predictive risk score stratification method, a strength would be that the analysis would identify and allow prioritization of high risk members that may represent the greatest cohort of opportunity for the company. A weakness of the method is the most expensive members might not intervenable (such as HIV) and the resulting members identified would create a diverse mix of condition wherein the design of the program would be an administrative burden
4) For the diabetes stratification method, a strength would be that the program would be easily designed since only one condition would be identified and a part of the program. A weakness would be that comorbidity of conditions are ignored as are other conditions so savings may be missed

2. Continued

5) For the clinician identified stratification method, a strength is that rules will be based on clinicians' expertise in evidence-based medicine. Clinicians often have access to additional data for identification and discussion and can leverage their personal relationship with members to easily identify which members are amenable to changing behaviors which could result in savings. Weaknesses of this methodology are that clinical rules may not identify high opportunity and clinicians are not always good at identifying macro-trends for populations that would result in a large savings achievement.

(c) Describe how to identify cost-effective DM programs through a focused review of relevant literature.

Commentary on Question:
The majority of candidates did identify the 3 components of a focused review. However, a fair number of candidates did not describe the components in detail.

A focused review of literature would include:

1. Searching online for relevant publications where one could investigate specific search engines such as Google Scholar or various medical search headings and journals
2. Assessing the quality of evidence – when reviewing the literature/study, it should be evaluated to determine whether the conclusions and evidence are valid whether savings were achieved to offset the program costs
3. Determining the generalization – when reviewing the literature / study, it should be evaluated whether the subpopulation is similar to the population you wish to manage

3. 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.

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

Sources:

Case Study

GHA-104-15 Actuarial Aspects of Employer Stop Loss, Pages 3-16

Commentary on Question:

This question was designed to test the understanding of pricing and leveraging impact on stop loss policies from an underwriting perspective. In addition, candidates were asked to provide recommendations and strategies to counter the leveraging impact. Most candidates were able to elaborate on different types of leveraging impact and calculate the leveraged trend for the case study. However, most candidates struggled to explain the sensitivity impact on leveraged trend for each given variable (from low to high).

Solution:

(a) Describe types of leveraging that impact what Royale Health will pay on specific stop loss (SSL) policies.

Commentary on Question:

Successful candidates were able to list and describe types of leveraging that impact what Royale Health will pay on SSL policies. Some candidates only listed the types of leveraging without explaining or elaborating. To get full credit, candidates had to list three types of leveraging and provide at least 2 lines/bullets of detail on each type

- Trend Leveraging
  - Claims distribution shifts relative to fixed deductibles/limits
  - Assuming the SSL deductible remains unchanged, claims in excess of the deductible will increase more quickly than overall trend
  - Impact of leveraging can be significant
  - If there is a limit on the claim reimbursement, it will counteract trend leveraging
  - Variation in trend by type of claim/service will also impact the SSL trend

3. Continued

- Area Leveraging
  - SSL claims increase more rapidly for areas that consistently are higher cost
  - So differences in area factors will broaden over time if costs for all areas increase at the same rate
  - But very complex/high-cost claims tend to be associated with a limited number of specialized (tertiary) facilities, which can counteract area leveraging
- Network Leveraging
  - Leverage is also seen when assuming fixed network discounts (off billed charges)
  - Stop loss provisions in facility contracts tend to stabilize network relativities/leveraging
  - Consider how network costs/discounts change for services likely to generate SSL claims
- Overall
  - Costs don't trend evenly, and the variation can have a big impact on claims in excess of the SSL deductible
  - Detail matters for SSL
  - Usage of 'select' facilities and certain contract provisions can offset leveraging impacts.

(b)

(i) *(1 point)* Complete the table with illustrative values for each variable and scenario.

(ii) *(2 points)* Explain the impact of each variable on SSL claims changes relative to the average medical claims trend.

Commentary on Question:
To get full credit, candidates had to fill out the table with sample values (low to high) for each variable. For each variable, they had to then describe the impact on leveraged trend as the variable increased or decreased. Most candidates struggled to answer this question. Instead of providing sensitivity on leveraged trend for each variable, candidates were describing which variable will have a higher or a lower impact on leveraged trend

3. Continued

Variable	Low	Medium	High
i. Claim size	$1,000 / ++	$50,000 / +	$125,000 / 0 to +
ii. SSL Deductible	$5,000 / 0	$20,000 / +	$100,000 / ++
iii. SSL Benefit Max	$50,000 / --	$500,000 / 0	Unlimited / +
iv. UC trend for Specialty Rx	1% / -	10% / 0	40% / ++
v. Prevalence of case-rate contracts	0% of services / +	5% of services / -	10% of services / --

Comments for graders to evaluate values in the table:

i. Larger claims will have larger current reimbursements and leveraging will have a smaller impact
ii. High deductibles have higher levels of leverage since fewer claims currently exceed those levels
iii. Benefit max will 'negate' leverage of higher-cost services, so low values will offset leverage
iv. These are high-cost claims, so high trends will drive larger leveraging impacts
v. These are generally used for higher-cost services, so more 'fixed' rate contacts that do not increase with trend will help offset the impact of leveraging

(c) Calculate the leveraged trend for the 2016 and 2017 policy periods for each of claimants B, O, N, D. Show your work.

Commentary on Question:
To receive full credit, leveraged trend had to be calculated for both 2016 & 2017 for each claimant. Some candidates only provided overall leveraged trend rather than for each claimant. Some candidates only calculated leveraged trend for 1 year rather than both years.

	Total Claims			SSL Claims				
Claimant	2015	2016	2017	2015	2016	Leveraged Trend	2017	Leveraged Trend
	(1)	(2) = (1) * 1.1	(3) = (2) * 1.1	(4) = (1) - 50k	(5) = (2) - 50k	(5)/(4)	(6) = (3) - 50k	(6)/(5)
B	150,000	165,000	181,500	100,000	115,000	15.00%	131,500	14.35%
O	160,000	176,000	193,600	110,000	126,000	14.55%	143,600	13.97%
N	275,000	302,500	332,750	225,000	252,500	12.22%	282,750	11.98%
D	195,000	214,500	235,950	145,000	164,500	13.45%	185,950	13.04%
Total	**780,000**	**858,000**	**943,800**	**580,000**	**658,000**	**13.45%**	**743,800**	**13.04%**
Trend		**10.00%**	**10.00%**		**13.45%**		**13.04%**	

3. Continued

(d) Propose actions Royale Health should take to ensure its specific SSL pricing appropriately reflects the impact of leveraging.

Commentary on Question:
To receive full credit, candidates had to at least provide 5 action items. Most candidates were able to give only 2 or 3 action items

- Construct a claims distribution and run simulations
- Review costs by area, type of service, provider, network, etc. and ensure changes in claims are modelled appropriately
- Conduct A/E studies on past experience
- Include margin in rates to appropriate reflect uncertainties/risks
- Ensure deductible levels are appropriate and adjust as needed to reflect changes in trend
- Consider adopting an aggregating specific stop loss product

4. Learning Objectives:

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

Learning Outcomes:

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

(3c) Calculate appropriate claim reserves given data.

Sources:

GHA 103-13 Health Reserves (Lloyd) page30-35 and page 8 of case study

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Explain why it might be necessary to apply smoothing techniques to development factors.

Commentary on Question:

Well prepared candidates described smoothing at a high level and gave multiple reasons as to what types of claim payment patterns changes would lead to the application of smoothing techniques in practice.

An answer may have included items from the following list:
Variations in claims processing such as

- a slow down in the system,
- delay in receipt of claims from providers,
- number of work days in a month,
- weather impacts will cause the amount of claims processed in the first few months after the incurred date to vary.
- Removal of large claims
- Significant growth in block of business
- Inflation and seasonality factors

4. Continued

(b) Calculate the smoothed factor for the 2nd lag month using the age-to-age factors in Exhibit 5 and the following methods:

- average 8
- 6 of last 8
- sum of digits
- constantly declining percent of 85%

Show your work.

Commentary on Question:
Most candidates calculated the smoothed factor for the 2nd lag month using average 8 and 6 of last 8 correctly. Correct responses for the sum of digits and constantly declining percent smoothing techniques were not as vast. Credit was given on the sum of digits and constantly declining percent techniques for those candidates that used 8 months or 11 months.

					Sum of Digits			Declining Percent	
Month	Lag	Original Factors	Average 8	6 of 8		Weight*	Factor	Weight	Factor
5/1/2015	2	1.936	1.936	1.936	8	0.222	0.430	1.000	1.936
4/1/2015	2	2.985	2.985		7	0.194	0.580	0.850	2.537
3/1/2015	2	1.940	1.940	1.940	6	0.167	0.323	0.723	1.402
2/1/2015	2	1.936	1.936	1.936	5	0.139	0.269	0.614	1.189
1/1/2015	2	1.581	1.581	1.581	4	0.111	0.176	0.522	0.825
12/1/2014	2	1.516	1.516		3	0.083	0.126	0.444	0.673
11/1/2014	2	2.469	2.469	2.469	2	0.056	0.137	0.377	0.931
10/1/2014	2	1.593	1.593	1.593	1	0.028	0.044	0.321	0.511
9/1/2014	2	1.894	* Weight 8/36, 7/36, 6/36, etc.						
8/1/2014	2	2.112							
7/1/2014	2	1.655							
		Answer:	**1.9945**	**1.9092**			**2.0863**	4.8501	**2.0626**

(c) Calculate the expected claims payments in December for the November incurral date using the:

- original age to age factor
- sum of digits smoothed factor

Show your work.

4. Continued

Commentary on Question:
The majority of candidates failed to convert the age-to-age factors into age-to-ultimate factors for this question. Outside of this, correct answers were considered for valuation dates of the beginning or the end of December. Given multiple possible interpretations of this question, there are also multiple solutions that result in full credit. One such solution is presented below.

The age-to-age factors first need to be turned into age-to-ultimate or completion factors as below:

Original Age-to-Age		Smoothed Lag 2 Age-to-Age	
Nov-14	Completion Factor	Nov-14	Completion Factor
11.674	0.013	11.674	0.016
2.469	0.155	2.0863	0.184
1.806	0.384	1.806	0.384
1.033	0.693	1.033	0.693
1.086	0.716	1.086	0.716
1.004	0.778	1.004	0.778
1.05	0.781	1.05	0.781
1.001	0.820	1.001	0.820
1.109	0.821	1.109	0.821
1.026	0.910	1.026	0.910
1.071	0.934	1.071	0.934
	1.000		1.000

Then, the lag 2 completion factors can be applied as follows:

Original Age-to-Age		Smoothed Lag 2 Age-to-Age	
75,000/0.155 =	482,454	75,000/0.184 =	407,672
482,454 - 75,000 =	407,454	407,672 - 75,000 =	332,672

(d) Recommend the age-to-age development factor to use for November claims in December. Justify your answer.

Commentary on Question:
Most candidates provided a recommendation of a smoothed age-to-age factor; however, justification tended to re-state the definition of smoothing rather than reference the variation that existed within the lag grid.

4. Continued

Various solutions were considered to be correct for part (d) of this problem. The primary focus was on selecting a smoothed age-to-age factor and on the justification. Justification should have focused on the variation that exists in the age-to-age factors specific to the case study referenced in the question and not a restatement of definitions.

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.

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

Sources:

GHA - 102-13 Evaluating Bundled Payments Contracting

Essentials of Managed Health Care, Kongstvedt, 6th Edition

- Ch. 4 The Provider Network
- Ch. 5 Provider Payment
- Ch. 10 Data Analysis and Provider Profiling in Health Plans

Commentary on Question:

Candidates did well on parts that required basic understanding of the elements to be considered with bundled payments.
There was a broad range in responses to the calculation portions. Some candidates performed well on the calculations, but most did not directly answer the question asked.

Solution:

(a) Describe contracting considerations for bundled payments.

Commentary on Question:
Candidates performed well on this part of the question. Full points were given when candidates described the main categories and did not just list those categories.

The considerations for bundled payments can be put into three categories:

Financial, operational, and quality considerations:

- Consider low volume facilities/providers and what should be done to help smooth their variation
- Consider how the bundle will be split between multiple providers
- Consider admin complexity
- Consider alternative arrangements and payments
- Consider if this might increase/impact utilization

5. Continued

Definition of an episode bundle:
- Defining the bundle: inclusions/exclusions of services
- Define time period and episode trigger

Catastrophic risk
- Consider outliers and if they should be removed
- Consider variation of length of stay and complications

(b) Calculate the 2017 change in payment for each hospital under this proposal. Show your work.

Commentary on Question:
Most candidates calculated the cost under the current arrangement correctly. Many candidates struggled with the separation of the hospital component from the targeted bundle to arrive at the hospital specific changes. Full credit was given to answers that showed absolute or relative changes by admission or in aggregate.

Medical Supp + Equip 2017 = 2015 Costs x 2015 Trend x 2016 Trend
= $9,000 x 1.0 x 1.02 = $9,180
Professional 2017 = 2015 Cost x 2015 Trend x 2016 Trend
= $10,000 x 1.0 x 1.02 = $10,200

2017 Facility Payment
= Total Bundle Rate – Supp+Equip – Professional
= $38,200 - $10,200 - $9,180 = $18,820
expected to go to each facility per knee replacement

	A	B	C
2016 Payment	3.1 x $5,515 = $17,096.50	3.5 x $5,600 = $19,600	3.2 x $5,755 = $18,416
2017 Proposed Payment	$18,820	$18,820	$18,820
Change	+ $1,723.50	- $780	+ $404

5. Continued

(c) Calculate a global bundled payment rate for 2017. Show your work.

Commentary on Question:
Most candidates did well on this part of the question. Most candidates replaced the average length of stay with 3.2 and calculated the per diem costs correctly. Charge master trend only needed to be applied to the charge master, not the fixed per diem rates.
Most candidates calculated the weighted average correctly, while some took a straight average.
Full credit was given when professional, medical supplies and equipment were included in the global bundle.

Hospital A:
$5,625 per day (given) or $5,625 * 3.2 = $18,000 per admission

Hospital B:
Average charge per day: $14,000 * 1.08 (trend) = $15,120
Average allowed per day: 0.4 * $15,120 = $6,048 per day or $6,048 * 3.2 = $19,354 per admission

Hospital C:
Fixed fee per day: $5,820
Average charge-based allowed per day (after the 3rd day): $13,000 * 1.10 (trend) x 0.5 = $7,150
(3 * $5,820 + 0.2 * $7,150) / 3 = $5,903 per day or $5,903 * 3.2 = $18,890 per admission

The weighted average allowed per day (using national benchmark ALOS):
(13 * $5,625 + 16 * $6,048 + 23 * $5,903) / 52 = $5,878 per day or $5,878 * 3.2 = $18,811 per admission

Adding professional and medical equipment components (calculated in part b) yields a global bundled rate of: $9,180 + $10,200 + $18,811 = $38,191

(d)

(i) Recommend hospital-specific bundled payment rates for 2017. Justify your answer.

(ii) Describe advantages and disadvantages of your recommendation.

5. Continued

Commentary on Question:
(i) Candidates were expected to make a clear bundled payment recommendation for each hospital. Acceptable answers were recommendations based on either part b) or part c). Justifications could include a discussion of the following: meeting budget needs, incentives to manage utilization for average length of stay, or revenue neutrality for the hospital.
Bundled rate recommendations without justifications received only partial credit. No credit was given for justifications without a clear recommendation.

(ii) The discussion of advantages and disadvantages needed to be consistent with the recommendation in part (i). Answers contradicting the recommendation in part (i) did not receive credit. Full credit was awarded to answers that addressed the recommendation in (i) and gave a balanced discussion of advantages and disadvantages.

(i) Hospital A:
$18,000 < $18,820
Bundled payment: $18,000 + $9,180 + $10,200 = $37,380
Don't want to pay them more than they would charge under FFS.

Hospital B:
Pay = $38,200
Less than under fee-for-service – provider will need to reduce their costs to maintain the same level of profit

Hospital C:
Pay = $38,200
Will reduce Quantum's costs and close to calculated hospital-specific global payment rate.

(ii) Advantages:
- For hospitals B and C this global rate will help encourage efficiency and coordination and will reduce costs for Quantum
- For hospital A, their pricing is already reasonable, may want to steer more patients to this provider as long as they also provide quality

Disadvantages:
- This bundled payment scheme does not differentiate for quality or complexity. There is no way to know which facility is of highest quality.
- Hospital A gets a lower payment – potentially penalizing hospital A for being more efficient

6. 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:

This question was meant to test not only the candidates' familiarity with a specific disease management savings calculation methodology, but also tying to the case study. Overall candidate performance was average, due to providing more general responses related to care management programs instead of the actuarially-adjusted historical control methodology. Well prepared candidates were able to provide specific detail for parts a and b.

Solution:

(a) Describe the actuarially-adjusted historical control methodology used for assessing DM financial outcomes.

Commentary on Question:

Most candidates received half of the grading points for this question, as they only provided one or two points on the description of the method. Some candidates also provided extraneous details on generic care management programs that were not specific to the actuarially-adjusted historical control methodology.

- Commonly used methodology to assess disease management outcomes
- Savings are not directly measurable but are derived as the difference between an estimated statistic and the actual statistic from the measurement period
- It's assumed that the same rules for population selection are applied for both the baseline and intervention populations, resulting in equivalence between baseline and intervention populations
- Key component is the application of the trend factor that adjusts historical experience to an estimate of current period experience

(b) Describe exposure considerations under the actuarially-adjusted historical control methodology.

6. Continued

Commentary on Question:
Most candidates received half of the grading points for this question as candidates provided more general responses about actuarial considerations for care management programs instead of focusing on just the exposure considerations. Candidates also tended to provide duplicate responses, such as saying members with high claim costs should be excluded as well as members eligible for other programs should be excluded. These would have fallen under the category of "Excluded Members" and would only receive one grading point.

- Exposure is one of the most critical components of a study
- Managed vs. Measured Populations
  - Population to be measured need not be the same population being managed
  - DM program may be offered to all chronic members, however some of these members may not be good candidates for management.
  - The converse is true
- Eligible Members
  - Must determine eligibility for the health plan first, then eligibility for the DM service.
- Chronic and Non-Chronic (Indexed) Members
  - Members are assigned based on their chronic status
  - Definitions must be objective and applied consistently within both the baseline and measurement period
  - Members who do not qualify as chronic are non-chronic, which can be the index group
- Excluded Members
  - Some members will be excluded from measurement
  - Not necessary that members excluded from the measured population be excluded from the managed population
  - Typically excluded due to one of the following reasons
    - Member class is not receptive to Disease Management
    - Member is a candidate for a program, but it's administered by another vendor (mental health, maternity, substance abuse)
    - Pattern of claims is subject to sharp discontinuity
    - Member's claims are significant, relative to other claimants in the class, an can introduce noise to the calculation
- Measured and Non-Measured Members
  - Tests to for inclusion can include
  - Continuous Coverage Test – typically 12 months of continuous coverage
  - Claim-Free Period
    - Addresses regression to the mean problem

6. Continued

(c) Calculate the savings from the DM program using the actuarially-adjusted historical control methodology. Show your work.

Commentary on Question:
To receive full credit candidates needed to identify three important concepts

a. Needed to remove HIV, transplant, and cancer claims and membership from the total
b. Needed to calculate a risk adjusted trend
c. Needed to calculate savings using the results above

Most candidates calculated the trend and savings on the total population but did not exclude the correct groups or risk adjust the index trend.

- According to the Actuarially adjusted historical control methodology, HIV, Transplant, and cancer members should be excluded from all periods.
- Also, the index trend should be adjusted for change in risk score
- Calculate new baseline and intervention chronic costs
  - (All Chronic Claims – Sum(HIV, Transplants, Cancer Claims))/(All Chronic Membership – Sum(HIV, Transplants, Cancer Membership)
  - $33,600,000 / 171,000 = 196.49 Baseline
  - $36,918,900 / 191,700 = 192.59 Intervention
- Calculate risk adjusted index trend
  - 160/150 -1 = .0667 index trend
  - 1.01/1.0 = .01 risk adjustment
  - Risk adjusted trend = (1+6.67%)/(1+ 1%) = 5.6%
- Calculate expected intervention period claims costs
  - 196.49 * (1.056) = 207.49
- Savings = Expected – Actual
  - 207.49 – 192.59 = 14.90 PMPM or $2,856,330 Total Dollars

7. 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.

Sources:

Individual Insurance, Ch. 4

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the following types of antiselection:

(i) External antiselection

(ii) Internal antiselection

(iii) Durational antiselection

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.
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 list the items of the model solution.

- External Antiselection
  - This type of antiselection occurs at time when the person is first becoming insured.
  - The applicant knows more about his health status than the insurance company.
    - People who know they may have a medical issue are more likely to seek coverage.
  - Insurers can control this antiselection through a variety of mechanisms, including:
    - Individual (medical) underwriting before issue.
      - Under the ACA, underwriting and pre-existing condition exclusions are no longer allowed for major medical insurance (group or individual).

7. Continued

- Policy provisions that exclude or limit coverage due to pre-existing conditions.
  - For major medical insurance, offering full coverage with no restrictions is generally the only legal option starting in 2014.
- Requiring an enrollment mechanism that doesn't permit or minimizes antiselection (such as minimum participation percentages for associations).

- Internal Antiselection
  - This type of antiselection occurs while the person is insured.
  - Occurs within an in force block of business which often tends to be this subtle kind of antiselection.
  - One common example of this is something which might be called premium leakage.
    - Premium leakage occurs at rate increase time, when most insurers will allow policyholders to choose higher deductibles at will, and without underwriting.
    - Higher risk policyholders will generally seek, and even more so keep, high coverage levels, while lower risk policyholders are much more flexible in their choices.
  - While in the past insurers have generally required members wishing to increase their benefits (for example, lower their deductible) to go through an underwriting process, this will no longer be the case under ACA.
    - That means that individuals who develop a serious medical condition will be able to change to a richer benefit plan at their next open enrollment opportunity.
    - This will likely make internal antiselection a much greater concern for individual health insurers going forward.

- Durational Antiselectiojn
  - This type of antiselection occurs when the insured makes decisions about whether to end the contract.
  - Among potentially lapsing policyholders, some will be high risk and some will be low risk.
    - High risk individuals are (1) less likely to be able to find coverage elsewhere, (2) less likely to be willing to become uninsured, since they know claims are likely on the way, and (3) emotionally less willing to change their current insurance situation.
    - As lapses continue year after year, the proportion of persisting policyholders from an initial group of sales who are higher risk will grow.
    - When an unusually large rate increase takes place, the lapse rate on that business typically jumps following that rate change.

7. Continued

- It remains to be seen how this dynamic will change for CMM insurance under the ACA.
  - With the elimination of underwriting and the other changes made by the law, it should be easier for unhealthy individuals to find alternative coverage when faced with an increase, at least if there is sufficient competition in the region where they live.
- When such antiselection occurs year after year, it is referred to as Cumulative Antiselection.

(b) List tools available for:

(i) Collecting underwriting information on insured members.

(ii) Analyzing the information collected on insured members.

Commentary on Question:
In order to get the maximum points allowed on this question, candidates must have listed the items of the model solution.
Most 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.

(i)

- The individual application
- Attending Physician Statement (APS)
- Commercial Databases
- Internal Data
- Telephone interviews
- Inspection reports
- Lab testing
- Medical Exams
- Tax returns

(ii)

- Debit manuals
- Predictive models

(c) Create a chart of ACA individual mandate income tax penalties for 2014, 2015, and 2016.

7. Continued

Commentary on Question:
In order to get the maximum points allowed on this question, candidates must have create a chart with the dollar amounts and the percentages for each years 2014 to 2016.
Few 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 indicate the dollar amounts and the percentages correctly.

Year	Per person (children at 50% of this amount)	% of Income > Tax Filing Threshold
2014	$95	1.00%
2015	$325	2.00%
2016	$695	2.50%

(d)

(i) (*2 points*) The amount of premium leakage. Show your work.

(ii) (*1 point*) The buy-down effect. Show your work.

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 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 calculate correctly the amount of Premium Leakage and the Buy-Down effect.

(i)

- Higher deductible plan premium = $1,000 x (1-0.05) = $950
- Next years' healthy plan premium = $950 x (1+0.2) = $1,140
- Next years' unhealthy plan premium = $1,000 x (1+0.2) = $1,200
- New average premium = $1,140 x 0.8 + $1,200 x 0.2 = $1,152
- Next years' healthy expected claims = $1,000 x (1-0.05) = $950
- Next years' unhealthy expected claims = $2,000
- New average claims = $950 x 0.8 + $2,000 x 0.2 = $1,160
- Premium Leakage = $1,160 - $1,152 = $8

7. Continued

(ii)

- Current average expected claims = $1,000 x 0.8 + $2,000 x 0.2 = $1,200
- Current premium = $1,000
  - After the 20% rate increase, all healthy members migrate to the higher deductible plan and all unhealthy members remain in the current plan.
- New average premium = $1,152
- Relative premium increase = $1,152 / $1,000 - 1 = 15.20%
- Buy down effect = $1,200 - 1,152 = $48
  or 20% - 15.20%= 4.80%

(e) Calculate the tax penalty for each policyholder for 2016. Show your work.

Commentary on Question:
In order to get the maximum points allowed in this question, the candidates must have got the correct calculations.
Very few candidates did score well in that part of the question.
Candidates that did not score well in that question are those that did not calculate correctly the tax penalty for each policyholder.

- Policyholder #1
  - % of Income = (40,000 – 4,000) x 2.5% = 900
  - Per person = 2 x 695 = 1,390
  - Penalty = Max (900 ; 1,390) = 1,390

- Policyholder #2
  - % of Income = (50,000 – 2,000) x 2.5% = 1,200
  - Per person = 1 x 695 + 1 x 695 x 50% = 1,042.50
  - Penalty = Max (1,200 ; 1,042.50) = 1,200

- Policyholder #3
  - % of Income = (75,000 – 4,000) x 2.5% = 1,775
  - Per person = 2 x 695 + 2 x 695 x 50% = 2,085
  - Penalty = Max (1,775 ; 2,085) = 2,085

(f) Recommend a strategy for DEF to reduce antiselection. Justify your recommendation.

7. Continued

Commentary on Question:
In order to get points in this question, the candidate must have recommended a strategy to reduce antiselection.
Most candidates did score very well in that part of the question.
Candidates that did score well are those that did recommend a strategy to reduce antiselection and explain its rationale.

- Because of the ACA provisions, DEF cannot use typical underwriting or pre-existing condition exclusions since they are no longer allowed. Offering full coverage with no restriction is the only legal option under ACA. In order to mitigate antiselection risk between health insurers, and also between the markets On and Off the Exchange, ACA has created the 3R's risk mitigation programs (Risk Adjustment Program + Reinsurance Program + Risk Corridor Program) and open enrollment mechanisms. For open enrollment periods, note that although On and Off exchange rules have been aligned to a great extent, there is still some potential for selection issues. Offering at least one gold and one silver level plan off-exchange could reduce antiselection. Having said that, DEF is limited on what can be done to reduce antiselection and then the best remaining option would be to limit antiselection through plan design, such as:
  - Apply a selection load to premiums, while keeping benefits and relativities between plans.
  - Offering supplemental benefits (i.e. dental and vision) only on some plans (all or nothing)
  - Reduce spread between plans.
  - Keep rate increase at a reasonable level.
  - Limit plan design differential and the number of plans offered.

Finally, a thorough analysis of antiselection effects should be done periodically by DEF in order to quantify antiselection effects.

8. 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.

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

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

Sources:

Duncan, 2nd Edition

Commentary on Question:

Overall, candidates performed well on this question, although few candidates were able to answer the question completely. Many candidates understood the calculation of total savings and ROI and received full credit for their responses to these parts of the question.

Some parts of the question asked candidates to make recommendations specific to ABC's disease management program. These parts of the question required candidates to apply their knowledge of the readings to a specific example. Many candidates struggled to provide complete responses specific to ABC.

Solution:

(a) Compare and contrast Total Savings and Return on Investment (ROI) for measuring results of a disease management (DM) program.

Commentary on Question:

Most candidates were able to identify some of the similarities and differences listed below. Nearly all candidates commented, either through formulas or words, that total savings is defined by a dollar amount whereas an ROI is defined as a ratio. Full credit was given to candidates who were able to identify at least four of the similarities or differences listed below. Partial credit was awarded otherwise.

8. Continued

Differences

- ROI favored by DM industry for reporting the value of a DM program
- Total savings alone doesn't provide the whole picture (i.e. ROI is needed to complete the cost-benefit analysis of a program)
- Total savings helps determine if a program delivers meaningful savings, absolutely or on a per member per month basis (e.g. a program can have a high ROI, but if the program is small, total savings will have a negligible impact on health plan trend)
- ROI can mask a positive marginal savings opportunity due to intervention on the marginal population
- Total savings shows dollars versus ROI shows a ratio/percent

Similarities

- No agreement in the industry regarding the calculation of either
- As the number of programs and particularly their overlap increases, savings calculations and drawing conclusions and comparisons between program ROIs becomes increasingly difficult
- Definitional issues and random variability in the components that are used in their calculations can be misleading for comparing actual program outcomes to what was expected or planned
- Similar inputs used to calculate each

(b) Calculate the following for ABC Insurance's DM program. Show your work.

(i) Total Savings

(ii) ROI

Commentary on Question:
Commentary on part (b), if appropriate. Click here to enter text.

Candidates received full credit for calculating gross or net total savings and ROI using either approach outlined below. Candidates received partial credit if they were able to show formulas and/or calculate intermediary steps, but were unable to arrive at a final correct answer.

8. Continued

- Total Savings (Approach 1)
  - DM Participants
    - Baseline Claims Cost PPPM = (900*7600+1500*1500+2500+950)/(7600+1500+950) = 1141
    - Intervention Period Claims Cost PPPM = (960*7600+1700*1500+2800*950)/(7600+1500+950) = 1244
  - Control
    - Baseline Claims Cost PPPM = (900*12000+1500*7600+2500+3500)/(12000+7600+3500) = 1340
    - Intervention Period Claims Cost PPPM = (1000*12000+1800*7600+3000*3500)/(12000+7600+3500) = 1566
  - Total Savings PPPM = [DM Participants Baseline Claims Cost PPPM * (Control Intervention Period Claims Cost PPPM / Control Baseline Claims Cost PPPM)] - DM Participants Intervention Period Claims Cost PPPM
    - Total Savings PPPM = [1141 * (1566 / 1340)] – 1244 = 89
  - Total Savings = Total Savings PPPM *Participant Count *12
    - Total Savings = 89 * (7600 + 1500 + 950) * 12 = $10,756,575
- Total Savings (Approach 2)
  - Low Risk Total Savings = [(900*(1000/900)) – 960] * 7600 * 12 = 3,648,000
  - Medium Risk Total Savings = [(1500*(1800/1500)) – 1700] * 1500 * 12 = 1,800,000
  - High Risk Total Savings = [(2500*(3000/2500)) – 2800] * 950 * 12 = 2,280,000
  - Total Savings = 3,648,000 + 1,800,000 + 2,280,000 = 7,728,000
- ROI (Approach 1)
  - ROI = Total Savings / Total Cost
    - ROI = $10,756,575 / [(7600*25 + 1500*100 + 950*250) * 12] = 1.6
- ROI (Approach 2)
  - ROI = Total Savings / Total Cost
    - ROI = 7,728,000 / [(7600*25 + 1500*100 + 950*250) * 12] = 1.1

8. Continued

(c) Calculate the change in ABC Insurance's claims cost trend as a result of the DM program. Show your work.

Commentary on Question:
Few candidates were able to answer this question completely. Partial credit was awarded to candidates for intermediary steps where formulas or calculations demonstrated some understanding of the concept.

- Year 0 Total Claims Cost = (1400*250000*12) = 4,200,000,000
- Year 1 Total Claims Cost with DM = (1500*275000*12) = 4,950,000,000
- Year 1 Total Claims Cost without DM = Year 1 Total Claims Cost (w/ DM) + Total Savings
  - Year 1 Total Claims Cost without DM = 4,950,000,000 + 10,756,575 = 4,960,756,575 **(using approach 1 from part b)**
  - Year 1 Total Claims Cost without DM = 4,950,000,000 + 7,728,000 = 4,957,728,000 **(using approach 2 from part b)**
- Year 1 Claims Cost Trend with DM = (Year 1 Total Claims Cost with DM / Year 0 Total Claims Cost) – 1
  - Year 1 Claims Cost Trend with DM = 4,950,000,000 / 4,200,000,000 – 1 = 17.86%
- Year 1 Claims Cost Trend without DM = Year 1 Total Claims Cost without DM / Year 0 Total Claims Cost – 1
  - Year 1 Claims Cost Trend without DM = 4,960,756,575 / 4,200,000,000 – 1 = 18.11% **(using approach 1 from part b)**
  - Year 1 Claims Cost Trend without DM = 4,957,728,000 / 4,200,000,000 – 1 = 18.04% **(using approach 2 from part b)**
- Change in Claims Cost Trend = Year 1 Claims Cost Trend with DM – Year 1 Claims Cost Trend without DM
  - Change in Claims Cost Trend = 17.86% - 18.11% = -0.26% **(using approach 1 from part b)**
  - Change in Claims Cost Trend = 17.86% - 18.04% = -0.18% **(using approach 2 from part b)**

(d)

(i) Calculate the ROI for each of the Medium and High Risk populations. Show your work.

(ii) Describe considerations to improve program results for the Medium and High Risk populations.

8. Continued

Commentary on Question:
Nearly all candidates were able to correctly calculate the ROI for each of the medium and high risk populations. Candidates received full credit for calculating either a gross or net ROI for each risk population.

Fewer candidates were able to completely answer the second part of this question. Full credit was given to candidates who were able to identify four or more of the considerations listed below. Partial credit was awarded otherwise.

(i) Medium Risk ROI = 1,800,000 / (1500*100*12) = 1.0
High Risk ROI = 2,280,000 / (950*250*12) = 0.8

(ii)

- Medium Risk
  - ROI of 1.0 is break even. Recommend monitoring this cohort to ensure the ROI doesn't drop below 1.0.
  - Recommend assessing whether medium risk is the appropriate classification for current participants and whether a low risk classification may be more appropriate
  - Recommend assessing operations (e.g. staffing levels, experience of case managers) that may be effecting the management of this population

- High Risk
  - ROI less than 1.0. Recommend further analysis of this cohort.
  - Recommend assessing whether high risk is the appropriate classification for current participants and whether a medium/low risk classification may be more appropriate
  - Recommend assessing operations (e.g. staffing levels, experience of case managers) that may be effecting the management of this population
  - Recommend assessing cost structure and negotiating a lower cost with the vendor for managing high risk participants
  - Recommend foregoing high risk management and only managing low/medium risk members

(e) Explain the potential benefits of using propensity scoring for analyzing ABC's DM program.

8. Continued

Commentary on Question:
Most candidates received partial credit on this part. Candidates who recognized that PSM addresses the problem of selection bias or compares equivalent populations and commented that PSM matches members on observable characteristics such as age, sex, etc. received full credit. Partial credit was awarded otherwise.

- PSM helps address the problem of selection bias
- PSM allows for the comparison of equivalent populations
- PSM controls for observable variation in age, sex, geography, and benefit plan mix through matching
- Often considered unethical practice to set aside a control group and withhold members from participation in a program. This increases the complexity of controlling for selection bias which PSM can help address.

9. **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:

Managing and Evaluating Healthcare Intervention Programs – Chapter 16

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the retrospective chronic identification method.

Commentary on Question:

Many candidates only listed the advantages and disadvantageous instead of describing the actual method. Also, there are many different chronic identification methods and most candidates did not specifically identify "the retrospective chronic identification method".

Members are identified as chronic at the beginning of the baseline period, irrespective of when the chronic member first meets the identification criteria.

- Index population is the complement of the chronic population
- Chronic population is relatively constant over study period
- This approach results in average claims PMPM that are lower for both chronic and non-chronic populations

(b) Calculate the savings of the DM program for 2015 both as a PMPM amount and a total dollar amount. Show your work.

Commentary on Question:

Majority of candidates calculated the DM program savings correctly. Some candidates had minor math mistakes and were awarded partial credit.

DM PMPM Savings = Baseline Chronic Population PMPM * (1+industry peer trend) – Actual Intervention Chronic Population PMPM

DM Aggregate Savings = DM PMPM Savings * Intervention Chronic Member * 12

- Calculate trend for industry peers $375/$350 = 7.14%
- Calculate expected chronic PMPM based on industry peer trend
  - 1.0714 * $500 = $535.71
- DM PMPM Savings = Expected Chronic PMPM compared to Actual PMPM
  - $535.5 - $525 = $10.71
- Total DM Dollar savings = $10.71 * 35,000 *12 months = $4.5 million

10. Learning Objectives:

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

Learning Outcomes:

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

Sources:

AAA Premium Deficiency

Commentary on Question:

This question was designed to test the candidates understanding of Premium Deficiency Reserves (PDR). Most candidates did well with the actual calculation of the PDR required by GHI at time 0. When it came to identifying the principles underlying the calculation of Premium Deficiency Reserves, as well as, the various approaches to expense projections available to GHI, most candidates struggled with identifying correct and thorough responses.

Solution:

(a) Explain the general principles underlying the calculation of premium deficiency reserves (PDR).

Commentary on Question:

Many candidates approach to this question was simply to define premium deficiency reserves rather than discussing the principles underlying the calculation of the PDR.

Principle 1: Situations that result in a PDR being established include the following:

1. A block of business will experience losses over the near term.
   - The principle is stated in terms of a "block of business," without specifying whether such a "block" is the reporting entity's accident and health business in the aggregate, a very narrowly defined group of contracts, or something intermediate.
2. A block of business will be profitable in the near term, but long term guarantees will cause it to be unprofitable over the projection period.
   - The period over which meaningful financial projections can be made for a block of business will vary widely, based on such factors as the guarantees made in the contracts and the number of contracts that constitute the block

10. Continued

Principle 2: The PDR should be determined to minimize "false positives." That is, no PDR should be required unless there is a meaningful potential for loss.

- Even highly profitable reporting entities may occasionally have blocks of business that are temporarily unprofitable.
- Entities that are at or near break-even may not have to set up PDRs at all.

Principle 3: The PDR also should be determined to minimize "false negatives." That is, a PDR should be required whenever there is an expectation of loss.

- The valuation may need to be performed not only over the full, projected lifetime of a block, but also over shorter intervals.
- There are also special implications if management is seriously considering actions that would increase costs or otherwise reduce profits.

(b) List the considerations in claims projections for PDRs.

Commentary on Question:
Many candidates struggled with putting together a comprehensive list of considerations in claims projections for PDRs.

- Current trends in medical costs and utilization
- Provider risk-sharing
- Changes in provider contracts
- Environmental and demographic impacts on morbidity
- Positive morbidity impact of growth in underwritten coverage
- Durational wear-off
- The impact of benefit changes
- The anti-selective impact of premium rate increases

(c)

(i) (*2 points*) Calculate the PDR at time 0. Show your work.

(ii) (*2 points*) Project the 5-year income statement that shows the change in PDR for each year. Show your work.

Commentary on Question:
Most candidates did well on calculating the various components of the liabilities (e.g. incurred claims, admin expenses, etc.) to arrive at the appropriate PDR. Those that did not get full credit for (c)(i) were usually the result of not including the underwriting loss for both years 1 and 2 in the needed initial PDR. For part (c)(ii), most candidates struggled to set up a 5 year income statement that showed the appropriate gain/loss in the initial two years, failing to take into consideration the first year's loss consisted of both the normal business liabilities (e.g. incurred claims, admin, commissions, etc.), as well as the establishment of the PDR.

10. Continued

(i) As the question was not clear as to whether or not the lapses took place at the beginning of the year or end of the year, either of the following was acceptable for (c)(i):

Lapse Rate at the Beginning of the Year: PDR at time 0 = $459,990

Year	Earned Premium	Incurred Claims	Claims Expenses	Admin Expenses	Commissions	Premium Taxes	U/W G/L	PDR
1	4,275,000	2,565,000	256,500	641,250	1,068,750	85,500	(342,000)	459,990
2	3,933,000	2,359,800	235,980	589,950	786,600	78,660	(117,990)	117,990
3	3,500,370	2,100,222	210,022	525,056	350,037	70,007	245,026	0
4	3,010,318	1,806,191	180,619	451,548	150,516	60,206	361,238	0
5	2,498,564	1,499,138	149,914	374,785	124,928	49,971	299,828	0
Totals	**17,217,252**	**10,330,351**	**1,033,035**	**2,582,588**	**2,480,831**	**344,345**	**446,102**	**577,980**

Lapse Rate at the End of the Year: PDR at time 0 = $488,250

Year	Earned Premium	Incurred Claims	Claims Expenses	Admin Expenses	Commissions	Premium Taxes	U/W G/L	PDR
1	4,500,000	2,700,000	270,000	675,000	1,125,000	90,000	(360,000)	488,250
2	4,275,000	2,565,000	256,500	641,250	855,000	85,500	(128,250)	128,250
3	3,933,000	2,359,800	235,980	589,950	393,300	78,660	275,310	0
4	3,500,370	2,100,222	210,022	525,056	175,019	70,007	420,044	0
5	3,010,318	1,806,191	180,619	451,548	150,516	60,206	361,238	0
Totals	**19,218,688**	**11,531,213**	**1,153,121**	**2,882,803**	**2,698,834**	**384,374**	**568,343**	**616,500**

(ii) Again, as the question was not clear as to whether or not the lapses took place at the beginning of the year or end of the year, either of the following was acceptable for (c)(ii):

Lapse Rate at the Beginning of the Year:

Year	Earned Premium	Incurred Claims	Claims Expenses	Admin Expenses	Commissions	Premium Taxes	Change in PDR	U/W G/L
1	4,275,000	2,565,000	256,500	641,250	1,068,750	85,500	459,990	(801,990)
2	3,933,000	2,359,800	235,980	589,950	786,600	78,660	(342,000)	224,010
3	3,500,370	2,100,222	210,022	525,056	350,037	70,007	(117,990)	363,016
4	3,010,318	1,806,191	180,619	451,548	150,516	60,206	0	361,238
5	2,498,564	1,499,138	149,914	374,785	124,928	49,971	0	299,828
Totals	**17,217,252**	**10,330,351**	**1,033,035**	**2,582,588**	**2,480,831**	**344,345**	**0**	**446,102**

10. Continued

Lapse Rate at the End of the Year:

Year	Earned Premium	Incurred Claims	Claims Expenses	Admin Expenses	Commissions	Premium Taxes	Change in PDR	U/W G/L
1	4,500,000	2,700,000	270,000	675,000	1,125,000	90,000	488,250	(848,250)
2	4,275,000	2,565,000	256,500	641,250	855,000	85,500	(360,000)	231,750
3	3,933,000	2,359,800	235,980	589,950	393,300	78,660	(128,250)	403,560
4	3,500,370	2,100,222	210,022	525,056	175,019	70,007	0	420,044
5	3,010,318	1,806,191	180,619	451,548	150,516	60,206	0	361,238
Totals	**19,218,688**	**11,531,213**	**1,153,121**	**2,882,803**	**2,698,834**	**384,374**	**0**	**568,343**

(d) Describe four approaches to expense projections GHI can use in this situation. Include advantages and disadvantages for each.

Commentary on Question:
Most candidates struggled with this part of the question and were unable to list the four approaches to expense projections when establishing a PDR. Many candidates listed various items that were extraneous to this question, for example, Deferred Acquisition Costs, Full Preliminary Term Method for calculating reserves, etc. Others listed various methods for reducing costs, items like reduce commissions, cut back on admin costs, etc. And still, others listed ideas to arrive at expenses such as percent of premium, percent of claims, flat fees, etc.

1. The expenses used in the PDR calculation could reflect the expense level that is expected to apply when the business is mature (e.g. the full variable expenses would be included, but the per-unit share of fixed and indirect expenses would be based on a mature volume of business).
   Advantages: This approach has some intuitive appeal.
   Disadvantages: It seems at odd with the authoritative guidance
2. The expenses in the PDR calculation could be based not on a fully mature volume of business, but on the more near-term projected volume (e.g. the volume expected to be achieved in the next year or two).
   Advantages: It still permits some current expenses to be ignored.
   Disadvantages: No more supportable than approach number 1.
3. The expenses in the PDR calculation could be graded down during the projection period, based on the volume expected to be added during that period.
   Disadvantages: Assumes some profitable new business will be written to cover some portion of the expenses.
4. The most straightforward approach would be to simply incorporate the full expense level in the projections for the existing contracts.
   Disadvantages: Could create a perpetuity of losses leading to a very large PDR (creating a "false positive").

10. Continued

(e) Recommend an approach to GHI. Justify your response.

Commentary on Question:
Almost all candidates were given credit for providing a recommendation of an expense approach to GHI. To achieve full credit, reference to the necessity of seeking guidance from relevant authorities was required, since none of the expense approaches are completely satisfactory.

This is one example of an acceptable answer:
From the moment the first contract is written, a PDR calculation becomes necessary, and the full expenses of the entity must be incorporated into the calculations. This may result in a very large expense burden being supported by a very small number of contracts. Therefore, it is recommended to project a reasonable volume of future business consistent with the business plan presented to authorities during the licensing process (based on the third approach listed above). Nevertheless, it is hard to craft an approach that seems to produce an intuitively reasonable result while conforming to the relative authoritative guidance. Under these circumstances, it may be necessary to seek regulatory relief from a strict application of the requirements.

11. 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.

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

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.

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

Sources:

SN 110-15 The Final Rule for the Medicare Shared Saving Program
Duncan Chapters 3 and 8
Measurement and Performance Health Care Quality And Efficiency: page 21

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Explain the use of the Minimum Savings Rate (MSR) in the MSSP.

Commentary on Question:

Candidates did well on part A if they knew the purpose was mainly to give savings back to the ACO for real savings and if they described the difference between one-sided and two-sided models. Simply stating that it's the minimum savings rate needed to get savings received no credit.

This helps ensure that costs below the benchmark reflect improved performance and not simply random fluctuation. One-Sided risk model varies by beneficiaries assigned and the ACO must meet at least the minimum level assigned. Two-sided risk model is a flat 2% regardless of membership assigned. If the target is met, all savings are shared on a first dollar basis.

11. Continued

(b) Calculate:

(i) The expenditure baseline.

(ii) The spending benchmarks for each of 2013, 2014, and 2015.

Show your work.

Commentary on Question:
Candidates did poorly on part B. Most candidates didn't know to only use risk adjustment for the baseline period and to only use age/sex (unless the risk score went down) for the expenditure baselines. Candidates also had problems knowing to which year to trend the baselines.

(i)

2010:

- Annual Cost * RiskScore2012/RiskScore2010 * 2010 Trend * 2011 Trend
- 12,000 * (1.25/1.23)*(1.03)*(1.03)
- 12,938

2011:

- Annual Cost * RiskScore2012/RiskScore2011 * 2011 Trend
- 12,500 * (1.25/1.30)*(1.03)
- 12,380

2012:

- Annual Cost * RiskScore2012/RiskScore2012
- 12,250 * (1.25/1.25)
- 12,250

- Weights are 10% for Y1, 30% for Y2, and 60% for Y3 adjusted values.
  - Y1*.1 + Y2 *.3 + Y3 *.6
  - 12,938*.1+12,380*.3+12,250*.6
  - =12,358

(ii)

2013:

- Baseline * AgeSex2013/AgeSex2012 * 2012 Trend
- 12,358 * (1.38/1.31)/(1.03)
- 13,409

11. Continued

2014:

- Baseline * AgeSex2014/AgeSex2012 * 2012 Trend * 2013 Trend
- 12,358 * (1.32/1.31)/(1.03*1.03)
- 13,211

2015:

- Baseline * AgeSex2015/AgeSex2012 * 2012 Trend * 2013 Trend * 2014 Trend
- 12,358 * (1.37/1.31)*(1.03*1.03*1.03)
- 14,122

(c) Calculate the total savings for a two-sided risk model over 2013-2015.

Show your work.

Commentary on Question:
Candidates did well on this question if they knew how to calculate the shared savings using the correct quality scores and following through to a total number at the end. Some candidates didn't know how to use the quality scores, while others stopped short of calculating a total dollar amount – either ignoring membership or leaving it at 3 separate years. If a candidate had normalized to a 1.0 risk score and 1.0 age/sex factor and attempted to use that for the shared savings calculation, very little credit was given. The total shared savings is based on an actual experienced number, not a normalized value.

- Shared Saving is calculated as (1- Actual Annual Cost/Benchmark)
  - 2013
    - 1 - 13,000/13,409
    - 3.05%
  - 2014
    - 1 - 13,500/13,210
    - -2.19%
  - 2015
    - 1 - 13,250/14,122
    - 6.18%

- Two-sided can receive up to 60% *of shared savings*
- Max loss share for two-sided is -60%

11. Continued

- Quality Scores
  - 100% for reporting all in first performance year (2013)
  - 0% in 2014 for getting 0% on all or nothing measures and 0% for less than 30% on other measures
  - 100% for 2015 for 100% all or nothing measures and greater than 90% on all other measures
- Shared Savings % Two-Sided Shared Savings
  - Calculated as Quality Score %*Max Shared Savings %* Actual Savings %
    - 2013
      - 100% *60% * 3.05% = 1.83%
    - 2014
      - 60%*-2.19% = -1.32%
    - 2015
      - 100%*6.18% = 3.71%
  - Two-Sided is maxed at 15% savings after applying the shared savings %

- Shared Savings Total dollars
  - = Shared Savings% * Membership* Baseline Value
    - 2013
      - 1.83%*10,000*13,409 = 2,451,605
    - 2014
      - -1.32%*10,000*13,210 = -1,737,679
    - 2015
      - 3.71%*10,000*14,122 = 5,232,622
- Sum All years = 5,946,548

(d) Describe ways a provider group-based ACO can generate savings.

Commentary on Question:
Candidates received full credit only if they described the ways ACOs generate savings instead of simply listing items.

- Care-Coordination can be implemented for certain patients
- Access to integrated medical records and consistent management by the physician can reduce the need for tests
- The ACO can develop a network of efficient providers for referrals and limit the use of less efficient and more expensive providers
- Focus on quality can result in fewer unnecessary services and by emphasis on preventative services – this will lead to later savings.

(e) List components that increase the speed of implementing quality measures and effectiveness.

11. Continued

Commentary on Question:
Candidates only needed to list applicable components to receive full credit. Candidates generally did poorly on this section.

- Improved Technology – internet, faster reporting, analytics
- Implementation at provider level
- Alignment between measurement and new payment reform
- High Provider engagement
- Better alignment between federal/state/private sector

(f) Calculate the net Return on Investment (ROI) for this DM program.

Show your work.

Commentary on Question:
About half of the candidates calculated gross ROI instead of net ROI which led to partial credit for this question. This was a straightforward ROI question that most candidates did well on other than the gross/net error. Note: if the candidate chose to combine parts F and G and give an overall ROI after shared savings were taken into account, that received full credit.

- Claims savings
  - New claims = Claims*(1-Savings)
  - = 13,500*(1-.045)
  - =12,893
- Total claims savings = Membership*(previous claims – new claims)
  - 10,000*(13,500-12,893)
  - 6,075,000
- Net ROI = (Savings – Cost)/Cost
  - (6,075,000 – 7,000,000) /(7,000,000)
  - -13.21%

(g) Calculate the new shared savings on the two-sided risk model for 2014.

Show your work.

Commentary on Question:
The calculation for this part was very similar to Part C, except the candidate needed to adjust quality, negative to positive shared savings maximum %, and the actual claims cost. Some candidates forgot to adjust the actual claims cost and left it as the original cost from part C. Since it wasn't clear from the question whether to use the 100% for all the quality scores, credit was given to candidates who used a mix of 100% reporting and 0% all or nothing.

11. Continued

- Shared Savings % Two-Sided Shared Savings
  - Calculated as Quality Score %*Max Shared Savings %* Actual Savings %
  - 2014 readjusted for new cost after DM program
    - 1 - Actual (New) Cost 2014/Benchmark 2014
    - 1 – 12,893/13,210
    - 2.40%
  - Calculated as Quality Score %*Max Shared Savings %* Actual Savings % - adjusted to 100% quality and 60% shared savings %
    - 100% *60% * 2.40% = 1.44%
    - Total Savings = Shared Savings% * Membership* Baseline Value
      - 1.44%*10,000*13,210 = 1,905,000

(h) Recommend a strategy to the ACO for the implementation of the DM program. Justify your response.

Commentary on Question:
Answers varied by the time candidates got to part H. If the candidate correctly associated the net ROI and the change due to the MSSP and came up with the correct recommendation, full credit was given. If the candidate got a negative ROI, a positive MSSP savings over the program cost amount needed, and still recommended not going with the program, no credit was given.

I recommend implementing the program. Although the ROI is negative when only accounting for the reduced claims cost, the increase in quality score and recalculation of the shared savings for 2014 make the program worthwhile. The program changes 2014 shared savings from – 1.7M to + 1.9M. Including this difference of 3.6M in the net ROI calculation for the program produces a positive net ROI of 38.79%

12. Learning Objectives:

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

Learning Outcomes:

(3c) Calculate appropriate claim reserves given data.

Sources:

Group Health Ch. 43

Commentary on Question:

This question tested the students' ability to not only calculate reserves when given the appropriate data, but also to demonstrate an understanding of issues and challenges of reserving.

Solution:

(a) Describe aspects of LTD contracts with respect to claim reserves.

Commentary on Question:

Students overall did very well on this question. Points were deducted for simply listing instead of describing.

- Periodic Benefits
  - Unlike most short-term health products, LTD plans typically have a benefit equal to a specified monthly or daily amount. LTD plans generally specify a monthly indemnity amount.
- Long term benefit periods
  - LTD plans have maximum benefit periods that are quite long relative to other health benefits. The maximum benefit period for LTD is often "To Age 65" (or another normal retirement age).
- Elimination periods
  - The elimination period is the period of time after someone experiences the insured event under the policy, but before benefits begin to accrue. LTD plans offer a variety of elimination periods, often 90 days or more.
- Optional benefits
  - LTD plans offer a variety of optional benefits that may affect the timing or amount of the monthly payments. Examples include: partial disability benefit which pay less than the full amount if the person is able to work part-time while disabled and cost of living adjustments which increase the benefit by an inflation factor while the person is disabled.
- Integration of benefits
  - LTD plans often contain provisions that reduce the amount of benefits paid to reflect social insurance benefits received while disabled (such as social security or worker's compensation).

12. Continued

- Limitations and exclusions
  - Certain types of claims, such as self-inflicted injuries, are excluded from coverage all together, and need not be considered in claims reserves. Other types of claims may be subject to limited pay periods, which should be reflected in the reserving process. One common example consists of mental and nervous claims, which are often limited to a payment period of two years over the lifetime of the claimant for LTP policies.

(b) Calculate the tabular claims reserves as of 6/30/2016, 7/31/2016, and 8/31/2016. Show your work.

Commentary on Question:
Students were given full credit if they assumed either a monthly or annual interest rate as long as the calculation was correct based on what they assumed. Overall students did fairly well on this calculation.

Use the formula for tabular claim reserves below:

$$V_n = \sum_{t=n}^{BP-1} Benefit_{t+1} \cdot \frac{l_{t+0.5}}{l_n} \cdot (1+i)^{-(t-n+0.5)/12}$$

Where:

n = Claim duration at the valuation date, in months (the claim reserve is computed as of the end of duration n)

$Benefit$ = Benefit paid in month t. The first benefit occurs in the month immediately following the valuation date.

t = Claim duration, in months from claim incurral date

BP = Final claim duration in which benefits may be paid

l_x = Value from continuance table at claim duration x for the appropriate age at disability

i = Annual interest rate

This formula assumes that claim payments are made in the middle of a month, so the continuance and interest discount terms reflect a mid-month assumption. Continuance table values for the middle of a month are computed through averaging:

$$l_{x+.50} = \frac{l_x + l_{x+1}}{2}$$

12. Continued

Calculation (5% Annual):

V3 = 1000*(825/850)*(1.05)^(-1/24) + 1000*(775/850)*(1.05)^(-3/24) + 1000*(725/850)*(1.05)^(-5/24) = 969+ 906+ 844 = 2719.15

V4 = 1000*(775/800)*(1.05)^(-1/24) + 1000*(725/800)*(1.05)^(-3/24) = 967 + 901 = 1867.52

V5 = 1000*(725/750)*(1.05)^(-1/24) = 964.70

Calculation (5% Monthly):

V3 = 1000*(825/850)*(1.05)^(-0.5) + 1000*(775/850)*(1.05)^(-1.5) + 1000*(725/850)*(1.05)^(-2.5) = 947+847+755 = 2549.62

V4 = 1000*(775/800)*(1.05)^(-0.5) + 1000*(725/800)*(1.05)^(-1.5) = 945 + 842 = 1787.70

V5 = 1000*(725/750)*(1.05)^(-0.5) = 943.37

(c) List other common data integrity issues.

Commentary on Question:
Most students were able to come up with a fair number of the below items.

- Missing Data
- Misstated age or gender
- Inaccurate elimination periods or benefits periods
- Incomplete or inaccurate information on benefit integration
- Inaccurate or inconsistent determination of the incurred date
- Inaccurate information on cause of disability
- Incorrect coding of claim status (open, closed, pending)

(d) Calculate the sufficiency or deficiency of the reserve for this member on 7/31/2016. Show your work.

Commentary on Question:
Most students compared the July reserve before and after instead of comparing the total reserve for the member before and after. Partial credit was given in this case.

12. Continued

Uses formula for tabular claim reserves in part b.

Calculation (5% Annual):

V4 = 1000*(675/700)*(1.05)^(-1/24) + 1000*(625/700)*(1.05)^(-3/24)
= 962 + 887 = 1849.76

V5 = 1000*(625/650)*(1.05)^(-1/24) = 959.59

Suff/Def = 1867.52 + 964.70 - 1849.76 - 959.59 = 22.89 Sufficiency

Calculation (5% Monthly):

V4 = 1000*(675/700)*(1.05)^(-0.5) + 1000*(625/700)*(1.05)^(-1.5)
= 941 + 830 = 1770.89

V5 = 1000*(625/650)*(1.05)^(-0.5) = 938.37

Suff/Def = 1787.70 + 943.37 – 1770.89 – 938.37 = 21.81 Sufficiency

(e) Your manager wants to develop reserves using diagnosis specific tables.

Describe challenges to this approach.

Commentary on Question:
Many students noted the lack of credible data, but did not state the complexity of calculation or describe the all or nothing approach.

- Lack of Credible Data:
  - The total number of claims for any specific cause of disability may be quite small, making it difficult to develop a credible morbidity basis.
- Complexity of calculation:
  - The use of a large number of different morbidity bases may complicate the reserve calculation process.
- "All or Nothing" Approach:
  - This method must be used consistently for all claims, if it is used at all. For example, it would not be appropriate to use a table assuming very rapid claims terminations for some claims expected to recover quickly, and a table based on aggregate industry experience for all other claims. This method would understate the reserves for the "all other" claims, since this category does not include any of the claims expected to recover quickly.