

GH RM Model Solutions

Spring 2023

1. Learning Objectives:

4. The candidate will understand how to apply risk adjustment in actuarial work.

Learning Outcomes:

- (4a) The candidate will understand how to apply risk adjustment in actuarial work.
- (4b) Apply risk adjustment to underwriting, pricing, claims and care management situations.
- (4c) Apply applicable Actuarial Standards of Practice

Sources:

Healthcare Risk Adjustment and Predictive Modeling, Ch. 13: Medicaid Risk Adjustment & Ch. 14: Risk Adjustment in Medicare (excluding Appendices 14.1 & 14.2)

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe components of the MAPD risk score.

Commentary on Question:

Few candidates performed well on this part of the question. Most candidates provided a list of the components versus a description of the components.

Risk Score Trend

- Accounts for expected changes in the plan's risk score
- It is applied twice (squared) for the two-year period from the base year to the bid contract year.
- Improvements in coding accuracy and completeness have been a major driver of risk score trend
- CMS has determined that nationwide, Medicare Advantage risk scores have trended upward at about 1.4%.
- A mortality factor may be included because the impact of mortality has a greater impact on a Medicare Advantage population than under 65 population.

1. Continued

Annual Population Change

- Accounts for expected risk profile of the expected population in the bid projection year.
- It is applied twice (squared) for the two-year period from the base year to the bid contract year
- It affects both revenue and claims projections on a PMPM basis, as well as risk score.

Part C/CMS Normalization Factor

- Accounts for the underlying FFS trend in risk scores and the effect of that trend on average risk score. It is designed to bring the average risk score back to 1.0.

CMS Coding Adjustment

- Accounts for coding differences between Medicare Advantage and traditional Medicare FFS.

- (b) Compare and contrast the calculation of MAPD and ERG risk scores.

Commentary on Question:

Many candidates struggled to compare and contrast the two risk scores and simply provided a list. Partial credit was given in these cases. Overall, candidates performed better on this part of the question.

Compare

- Both consider age and gender
- Both consider diagnoses
- Data timing: the scoring date will often be some months after the end of the data period
- Both develop relative risk scores

Contrast

- Different number of diagnosis categories
- Different underlying data
- Risk Scores reflect relativities within markedly different populations
- Different factors for each risk score
- Risk scores are applied to different populations
- Diagnosis codes and NDCs are updated more frequently for ERGs (monthly, compared to at most annual)
- The number of months to allow for run-out differ
- MAPD is relative to all Medicare enrolled, while ERG is relative to whatever categories are defined
- MAPD risk score is additive of age/gender and conditions (Hierarchical Condition Codes = HCCs); ERG risk score is based on ERGs assigned as well as age/gender

1. Continued

- MAPD age/gender risk scores vary by population type; ERG does not
- MAPD determines separate risk scores for Part C and Part D. Of note, Part C is based on allowed and Part D is based on paid. ERG determines one risk score reflective of the member.

2. Learning Objectives:

2. The candidate will understand how to evaluate the effectiveness of different provider reimbursement methods from both a cost and quality point of view.

Learning Outcomes:

- (2b) Evaluate standard contracting methods from a cost-effective & quality perspective.
- (2c) Understand contracts between providers and insurers.

Sources:

GHRM-114-23: Chapter 45 of Group Insurance, Skwire, Daniel, 8th Edition, 2021

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a)
 - (i) List elements necessary for network management.
 - (i) Describe an example of how these elements could be at odds with each other.

Commentary on Question:

Full credit was given if the candidate listed the majority of the following elements and provided an example on how two of them could be at odds with each other.

1. Articulate the goals of the network
2. Comply with applicable regulations
3. Ensure quality standards are met
4. Manage cost
5. Manage risks
6. Evaluate the network on an on-going basis

In order to comply with a new regulation, costs might increase. For example, if the provider contract is tied to an government- sanctioned provider fee schedule, then costs will increase if the company has to comply with an increased provider fee schedule.

- (b) Describe necessary steps for ABC to develop a set of measures for provider network quality.

Commentary on Question:

Candidates generally scored well on this part of the question if they described the steps instead of just listing them.

2. Continued

1. Establish the validity of the measure. This usually entails a literature review and potential independent actuarial analysis of cost and savings.
2. Assign the measure to a domain within ABC's quality framework. Domains include attributes such as efficiency and safety.
3. Determine the algorithm for whether a measure has been met. ABC can typically rely on NQF and similar organizations. NQF has several algorithms and ABC should evaluate whether those are appropriate for its own use.
4. Make the necessary updates to systems, work streams, and documentation so the measure can be used as needed.

(c)

- (i) Calculate the efficiency of Hospital X using the Portfolio Method. Show your work.
- (i) Assess potential concerns with the efficiency assessment.
- (ii) Recommend a bundled payment program for Hospital X that maximizes the efficiency of and the number of services included in the program. Justify your response.

Commentary on Question:

Some candidates did not accurately use the portfolio method, which was mentioned by name and illustrated in the source material. Other potential concerns or recommended bundles not listed in the model solution were also accepted for credit.

(i)

Ratios:

Cardiac Stents: $200,000/20,000 = 1000\%$

Knee Replacements: $37,000/40,000 = 92.5\%$

Hip Replacements: $40,000/45,000 = 88.9\%$

Colonoscopies: $2,600/2,500 = 104\%$

Appendectomies: $15,000/12,000 = 125\%$

Total: $28,748/27,687 = 103.8\%$

(ii)

Hospital X's costs for cardiac stents is very high relative to the market. It is likely due to a complication experienced for one of the two procedures performed. If you remove this procedure, X is actually efficient (below 100%). X is also inefficient for appendectomies (125%). This could be a credibility issue as there are only 5 procedures.

2. Continued

Total Excl Cardiac: $25,486/27,833 = 91.57\%$

(iii)

I recommend a bundled payment program for all services excluding cardiac stents. Although Hospital X is paid less per service for colonoscopies and appendectomies, this loss in payment is offset by the savings achieved for knee and hip replacements. This bundled payment still allows Hospital X to achieve savings under the bundled payment program while also maximizing the number of services included in the program.

3. Learning Objectives:

1. The candidate will understand how to evaluate and recommend an employee benefit strategy.

Learning Outcomes:

- (1a) Describe structure of employee benefit plans and products offered and the rationale for offering these structures.
- (1b) Describe elements of flexible benefit design and management.
- (1c) Recommend an employee benefit strategy in light of an employer's objectives.

Sources:

The Handbook of Employee Benefits, Ch. 1: The Environment of Employee Benefit Plans

GHRM-103-23: Ch. 16 of Canadian Handbook of Flexible Benefits, McKay, 3rd Edition, 2007

The Handbook of Employee Benefits, Ch. 25: Cafeteria Plan Design and Administration

Commentary on Question:

Overall candidates performed well on the question, with most candidates receiving at least half of the total points available. The most common reason for candidates not receiving credit on any part of the question was often a result of candidates only providing a list when the question asked for a description or not justifying their response.

Solution:

- (a) Describe characteristics of the group technique for employee benefit design.

Commentary on Question:

Candidates generally performed well on this part of the question, earning partial or full credit. Some candidates provided only a list versus a description.

- Only certain groups eligible
 - Make sure that obtaining insurance is incidental to the group seeking coverage, a group is not formed solely for obtaining insurance
- Steady flow of lives into the group
 - Younger individuals replace older individuals that leave maintain a constant mortality or morbidity ratio in the group. Without this costs could increase dramatically.
- Minimum number of persons in a group
 - The minimum number provision is designed to prevent less healthy lives from becoming a major part of the group and to spread the expenses of the benefit plan over a larger number of individuals

3. Continued

- Minimum portion of the group must participate
 - Rationale is to reduce adverse selection and to spread admin expense
- Eligibility requirements
 - Prevention of adverse selection, a waiting period may be used, later enrollment may require medical information
- Maximum limits for any one person
 - Prevents excessive coverage for unhealthy individuals
- Automatic determination of benefits
 - Prevents excessive coverage for unhealthy individuals, may be determined by salary, years of service or position, or flat amount for everyone
- A central and efficient administrative agency
 - Keep expenses to a minimum and to handle the mechanics of the plan. An employer is an ideal unit because it maintains payroll and other employee information to meet tax and record-keeping requirements.

(b)

- (i) Identify the issue described.
- (ii) Recommend design approaches to mitigate this issue. Justify your response.

Commentary on Question:

- *Part i)*
 - *Nearly all candidates correctly identified the issue described as Adverse Selection or Anti-Selection. Many candidates also provided a description or explanation, although this was not necessary to receive full credit.*
 - *Part ii)*
 - *Candidate performance was mixed on this part of the question. Several candidates provided a list of approaches without justification. Other approaches not listed here, such as selection loading plans, were also acceptable.*
- i) The issue described is adverse selection. Employees have the availability of choice and made decisions based on predictable costs (vision and dental having high potential of predictability).
 - ii) I recommend the following design approaches to mitigate adverse selection
 - a. Limit the frequency of choice
 - i. The longer the period of choice, the more difficult for employees to predict expenses or influence the timing of incurring those expenses

3. Continued

- b. Limit the degree of change
 - i. Make it difficult for employee to make major changes in benefit levels based on knowledge of upcoming expenses – aka “staircase rule”
 - c. Level the spread between options
 - i. Minimize differences between high and low options to avoid extremes in employee elections
 - ii. Maximum benefit limitations such as fixed dollar or percentage of salary
 - d. Require proof of insurability
 - i. Require proof before increasing coverage
 - e. Group certain coverages together
 - i. Reduces employee ability to predict specific benefit plan utilization. For example, grouping dental/vision coverage with medical.
 - f. Delay full payment
 - i. Prevent the possibility of a windfall accruing to employees moving in and out of coverage and also discourage such patterns of election.
 - ii. For example, in dental, lower benefits might be paid in the first six months following a period of no coverage.
 - g. Offer a health spending account
 - i. Reduces the insurance element, fixing the benefit cost, and eliminates potential for adverse selection
 - h. Maintain parallel design
 - i. Consistency in option design helps avoid differences in coverage that employees may be able to manipulate, especially for predictable benefit
 - i. Test the program with employees
 - i. Test preliminary design with employees that might reveal potential weaknesses
- (c) Explain the advantages and disadvantages of a Cafeteria Plan to an employer.

Commentary on Question:

Most candidates did well on this part of the question, although several candidates only listed advantages without any disadvantages. In addition to the responses shown below, others consistent with the source material were accepted.

3. Continued

Advantages:

- Financial incentives
 - Not having to pay FICA or FUTA tax on contributions and deferral amounts are not considered wages when determining workers' compensation premiums and other payroll-based expenses
- Improve employee relations
 - Required selection helps employees conceptualize the overall value of their benefits
- Cost containment and/or benefit optimization
 - Prevent squandering benefit dollars on duplicate or unneeded benefits based on employee's situation (for example, single and does not need life insurance)
- Consumer-driven health care / cost containment
 - Making employees take a more active role in controlling benefit costs through making them choose based on expected needs

Disadvantages:

- Ongoing costs associated with the administration and operation of the plan.
 - In many cases, the payroll-tax savings the employer gains will far outweigh the plan's operational costs. Nevertheless, an employer must be aware that there are costs involved in establishing and operating the plan.
 - Also, a cafeteria plan is required to be operated in accordance with strict adherence to federal tax law through a written plan document.
- If the cafeteria plan includes a medical reimbursement feature (a health care FSA), the uniform coverage rules require the full amount of benefit elected to be available during the entire plan year regardless of how much an employee has actually contributed to date.
 - This means that the employer assumes a certain degree of financial risk with respect to elected benefits.
- There are potential problems associated with adverse selection on the part of plan participants.
 - This adverse selection could result in underwriting problems.
- Cafeteria plans are subject to complex coverage and nondiscrimination testing.

3. Continued

- (d) Assess whether each of the following is considered an acceptable mid-year change to an employee's medical account under Section 125 regulations. Justify your response.
- (i) Switching carriers after moving from one state to another
 - (ii) Removing coverage for a spouse following the birth of a child
 - (iii) Adding coverage for a spouse who lost their own coverage after becoming unemployed
 - (iv) Electing a richer plan because of anticipated doctor's visits

Commentary on Question:

Most candidates did well on this part of the question. Some candidates, however, assessed (ii) as an acceptable mid-year change. Candidates also needed to provide justification to receive full credit.

- (i) Acceptable: Consistent with change in place of work/residence.
- (ii) Not Acceptable: Change not consistent with the qualifying event. Adding the baby would be acceptable, but not removing a spouse after having a baby.
- (iii) Acceptable: Consistent with significant change in health coverage as a result of spouse employment status.
- (iv) Not Acceptable: Not a qualifying event and would lead to anti-selection.

4. Learning Objectives:

2. The candidate will understand how to evaluate the effectiveness of different provider reimbursement methods from both a cost and quality point of view.

Learning Outcomes:

- (2b) Evaluate standard contracting methods from a cost-effective & quality perspective.
- (2d) Understand accountable care organizations and medical patient home models and their impact on quality, utilization and costs.

Sources:

GHRM-105-23: Avoiding Unintended Consequences in ACO Payment Model

Value-Based Care Framework, The Actuary, Apr 2020

The Cost of Value-Based Care, The Actuary, Apr 2020

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) List marketplace data and metrics that actuaries may consider when modeling potential outcomes for providers moving to a Value-Based Care model.

Commentary on Question:

Candidates generally did well on this part of the question. In addition to the responses shown below, others consistent with the source material were also acceptable.

- Type of benefits the provider can legally take
- Risk limits the provider can legally take
- Competition
- Claims data
- Insured vs. non-insured population by segment
- Insured population by geographical area
- Economic environment

- (b) Describe four capabilities of the Value-Based Care Framework.

Commentary on Question:

Most candidates performed well on this part of the question. Several candidates only listed the capabilities. Candidates needed to describe the capabilities to receive full credit.

4. Continued

1. Value based care strategy
 - a. Overview: Answers the who? What? Why? When? Where? Considers the target objectives.
 - b. Key components include target populations and geographies.
 2. High network performance management
 - a. Overview: considers the provider composition of the network
 - b. Key component: provider composition (including provider types and access)
 3. Population and health management
 - a. Overview: considers the disease management programs in place to support the Value based care framework
 - b. Key components: disease management programs
 4. Data and analytics
 - a. Overview: considers the data governance required for a successful value-based care framework.
 - b. Key components include clinical data (such as EHR) and financial data.
- (c) Calculate the incremental revenue OPQ can receive over the three-year period from 20X4-20X6 by performing two additional hip replacements in 20X3. Show your work.

Commentary on Question:

Candidates did very well on this part of the question. There were some candidates that used uniform weighting, for which partial credit was given.

Step 1: Calculate benchmark without two hip replacements included.

$$\text{Benchmark} = (0.1 * 1,000,000) + (0.3 * 1,200,000) + (0.6 * 1,400,000) = 100,000 + 360,000 + 840,000 = 1,300,000$$

Step 2: Calculate shared savings for each of 2024-2026 without hip replacements Included

Since this is a one-sided model, the provider can share in 50% of the savings. The savings will be the same in each of the three years since the spend is \$1,200,000 per year

$$\text{Savings} = 50\% * (1,300,000 - 1,200,000) = 50,000$$

$$\text{Three-year savings} = 50,000 * 3 = 150,000$$

4. Continued

Step 3: Calculate benchmark with two hip replacements included.

$$\begin{aligned}\text{Benchmark} &= (0.1 * 1,000,000) + (0.3 * 1,200,000) + (0.6 * (1,400,000 + 15,000 + 15,000)) \\ &= 100,000 + 360,000 + 858,000 = 1,318,000\end{aligned}$$

Step 4: Calculate shared savings for each of 2024-2026 with hip replacements Included

Same calculation as step 2, but with the new benchmark calculated in step 3

$$\text{Savings} = 50\% * (1,318,000 - 1,200,000) = 59,000$$

$$\text{Three-year savings} = 59,000 * 3 = 177,000$$

Step 5: Calculate total incremental revenue generated by OPQ

$$\text{Total incremental revenue} = \text{Step 4} - \text{Step 2} = 177,000 - 150,000 = \mathbf{\$27,000}$$

- (d) Propose three changes to LMN's ACO arrangement with OPQ that will prevent unintended incentives. Justify your response.

Commentary on Question:

Most candidates performed well on this part of the question.

1. Instead of applying weighting benchmarks of .1, .3, and .6 respectively to years 20X1 – 20X3, apply an equal weight to each of the three years. This will reduce the benchmark because since the heaviest weight was on the year that had the increased FFS replacements and thus increased spending, the benchmark was inflated. By reducing the benchmark, this will remove the unintended incentive to increase spending in the 3rd year.
2. Introduce a yardstick competition in which the benchmark is determined by comparing with similar ACOs in LMN's geographical area. This will prevent unintended incentives by encouraging better efficiency by LMN because they now must compete with other ACOs instead of their own history.
3. Consider extending the benchmarking period from 3 years to 5 years to have more years by which to contribute to the benchmark; this would mean entering the ACO arrangement in 20X6. This will ensure a more balanced benchmark that doesn't place too much weight on a single year, thereby causing unintended incentives to inflate spending in that one single year.

4. Continued

- (e) Compare each of the following reimbursement models to an ACO shared savings reimbursement model in terms of degree of risk managed by the provider and the level of provider sophistication. Justify your response.
- (i) Fee for Service
 - (ii) Global Payment/Capitation

Commentary on Question:

Most candidates were able to describe the various risks associated with Fee for Service and Global Payment/Capitation arrangements, but some candidates did not compare those to an ACO shared savings reimbursement model.

- (i) Under FFS there is a lesser degree of risk managed by the provider, because under FFS it is purely a volume-based arrangement; outcomes and quality are not measured (unlike ACO in which outcomes and quality measures are considered). The level of provider sophistication is thus lower under FFS than ACO, because they don't have to consider quality measures or outcomes and efficiencies.
- (ii) Under Global payment/capitation there is a higher degree of risk managed by the provider than compared to an ACO shared savings because under global payment / capitation, the provider takes on ALL the risk of managing members. The level of sophistication required is higher than ACO shared savings because again, they are assuming all risk. They are reimbursed not on volume of services but on the average cost of each member for the whole population.

5. Learning Objectives:

3. The candidate will understand how to evaluate healthcare intervention programs.

Learning Outcomes:

- (3a) Describe, compare and evaluate programs.
- (3b) Estimate savings, utilization rate changes and return on investment.
- (3d) Calculate chronic and non-chronic trends in a manner that reflects patient risk.

Sources:

Managing and Evaluating Healthcare Intervention Programs, Ch. 16: Testing Actuarial Methods for Evaluating Disease Management Savings Outcomes (excluding appendices)

Commentary on Question:

This question tested candidates' knowledge of savings calculations for disease management programs.

Solution:

- (a) Describe the impact on a savings calculation of identifying patients with hypertension using only medical claims versus using both medical and pharmaceutical claims.

Commentary on Question:

Candidates generally performed well on this part of the question.

- The count of members identified based on medical only claims would be less than those identified based on using both medical and pharmaceutical claims. Using pharmaceutical claims allows imputation of a diagnosis that may not be present in medical claims data alone.
 - If members are only identified by medical claims, the less severe members who are identified by only prescription drug claims would be initially left out.
 - The savings per member would likely increase because members are higher risk and therefore have greater savings opportunity.
 - The overall savings could be greater depending on how many members were included.
- (b) Calculate the total percentage reduction in aggregate claims spend from the DM program for each of the intervention years under the following scenarios:
 - (i) Base-Case, that is, attributing each member based upon their condition status in each year. Show your work.
 - (ii) Retrospective Chronic Identification. Show your work.

5. Continued

Commentary on Question:

Candidate performance was mixed on this part of the question. Several candidates did not identify the correct members for the disease group & control group in part (ii). Some candidates did not perform calculations on a per-member basis, which resulted in incorrect answers. Some candidates also stopped after calculating the total dollar savings and did not calculate the percentage reduction in aggregate claims spend.

For all items of part B: For (i), assign based on the condition status in that time period. For (ii), assign for all time periods based on whether the member has the condition in Intervention Year 2.

Calculate chronic and non-chronic PMPMs by summing up the total claims for chronic and non-chronic and dividing by 12.

i:

	Baseline	Intervention Year 1	Intervention Year 2
Non-chronic	\$257.97	\$264.97	\$275.78
Chronic	\$369.92	\$361.92	\$401.46

ii:

	Baseline	Intervention Year 1	Intervention Year 2
Non-chronic	\$241.61	\$251.83	\$275.78
Chronic	\$370.79	\$376.42	\$401.46

Calculate Non-chronic trends for each of intervention years 1 and 2.

i: Intervention Year 1: $\$264.97 / \$257.97 = 2.71\%$
 Intervention Year 2: $\$275.78 / \$264.97 = 4.08\%$

ii: Intervention Year 1: $\$251.83 / \$241.61 = 4.23\%$
 Intervention Year 2: $\$275.78 / \$251.83 = 9.51\%$

Derive the savings PMPM based on the non-chronic trend applied to the chronic PMPM.

i: Intervention Year 1 savings: $(\$369.92 * 1.0271) - \$361.92 = \$18.03$
 Intervention Year 2 savings: $(\$361.92 * 1.0408) - \$401.46 = -\$24.78$

ii: Intervention Year 1 savings: $(\$370.79 * 1.0423) - \$376.42 = \$10.05$
 Intervention Year 2 savings: $(\$376.42 * 1.0951) - \$401.46 = \$10.75$

5. Continued

Determine total costs based upon the MM of chronic and non-chronic members.

i: Intervention Year 1: (3,000 chronic member months x \$361.92 PMPM + 9,000 non-chronic member months * \$264.97 PMPM) = ~\$3,470,500
Intervention Year 2: (3,600 chronic members x \$401.46 PMPM + 8,400 non-chronic members * \$275.78 PMPM) = ~\$3,761,833

ii: Matches I since the total membership remains the same in both calculations, and thus the total cost is the same.

Determine total dollar savings by multiplying the savings PMPM by the member months.

i: Intervention Year 1: \$18.03 * 3,000 chronic members = ~\$54,103
Intervention Year 2: -\$24.78 * 3,600 chronic members * 12 = ~ -\$89,222

ii: Intervention Year 1: \$10.05 * 3,000 chronic members * 12 = ~\$36,186
Intervention Year 2: \$10.75 * 3,600 chronic members * 12 = ~\$38,705

Calculate the percentage of total premium savings by dividing the dollar savings by the total costs.

i: Intervention Year 1: \$54,103 / \$3,470,500 = 1.6%
Intervention Year 2: -\$89,222 / \$3,761,833 = -2.4%

ii: Intervention Year 1: \$36,186 / \$3,470,500 = 1.0%
Intervention Year 2: \$38,705 / \$3,761,833 = 1.0%

(c)

- (i) Critique the scenarios from part b.
- (ii) Recommend whether Company ABC should continue offering the DM program. Justify your response.

Commentary on Question:

Most candidates received partial credit on this part of the question. Candidates needed to provide justification for their recommendation in order to receive full credit.

5. Continued

Critique scenarios:

- There is no consensus about which calculation method is the best approach.
- The savings results are very different between the two methods. Using i, there are widely varied savings between the two years, but using ii, there are consistent and positive savings.
- The members who were not classified as chronic in earlier years but were later classified as chronic were interfering with the trend in the non-chronic cohort. Therefore, it could be more fair to use method (ii).
- The members who aren't classified as chronic couldn't have been managed since their identification status was unknown. Therefore, it could be more fair to use method (i).
- Consider expressing results using a range of outcomes instead of a 'point' estimate.

Company ABC should not continue to offer the DM program. The savings identified from both methods are less than the annual \$200,000 to run the program, yielding an ROI of less than 1.0, meaning the program is running at a loss. Here are the ROI's for the retrospective method:

Year 1: $\$36,186 / \$200,000 = 0.18$

Year 2: $\$38,705 / \$200,000 = 0.19$

6. Learning Objectives:

4. The candidate will understand how to apply risk adjustment in actuarial work.

Learning Outcomes:

(4a) The candidate will understand how to apply risk adjustment in actuarial work.

(4b) Apply risk adjustment to underwriting, pricing, claims and care management situations.

(4c) Apply applicable Actuarial Standards of Practice

Sources:

Healthcare Risk Adjustment and Predictive Modeling, Ch. 21: Risk Adjustment on the ACA Exchanges

ASOP 23: Data Quality (excluding Appendices)

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Identify and describe issues from the study regarding the use of Medicare Hierarchical Condition Categories (HCCs) for risk adjustment.\

Commentary on Question:

Most candidates identified the issues and included at least one of the discussion points describing the issues.

Issue 1: Although the CMS HCC risk adjusters map diagnosis codes to 189 HCCs, only 70 HCCs are actually used for risk scoring.

Discussion

- The mapped diagnoses represent common chronic conditions, and therefore are likely to represent a larger percentage of patients and conditions.
- There are some conditions of fairly significant prevalence whose inclusion could improve the predictive accuracy of the model (a possible reason for better performance of some commercial models that include more conditions).

Issue 2: There is considerable variation within HCCs in terms of patient severity and experience.

Discussion

- Any grouper model must aggregate a range of severities and costs
- with a large enough sample of patients, the averaging will be a better estimator of the cost of the patient group, but for a specific patient, the estimation is likely to be inaccurate.

6. Continued

Issue 3: Certain racial groups and income levels are likely to be higher consumers of healthcare.

Discussion

- A single model that does not capture these variables is likely to lack predictive accuracy.
- The MedPAC report examined the effect of adding racial and income variables to the model, however, and found little improvement.
- This result appears to be inconsistent with a Society of Actuaries Study which found numerous examples of non-traditional variables that influence financial performance.”

Issue 4: despite the chronic nature of a patient’s condition, treatment and claims for that condition are not necessarily present in the patient’s record each year.

Discussion

- MedPAC recommends using two years of diagnosis data
- This recommendation may be impractical to implement in some cases.

Issue 5: Number of conditions in the patient’s record (or in the case of drug claims, the number of therapeutic classes) is predictive of higher risk.

Discussion

- MedPAC finds that a model that includes the number of conditions performs slightly better overall than the standard model, with more accurate prediction for the sickest patients.
- The standard model underpredicts cost at the extremes of the risk distribution, therefore, the addition of this variable would appear to be beneficial.

(b) Define and describe issues with each of the following biases:

- (i) Bias against zero-condition members
- (ii) Bias against limited network and other lower cost plans

Commentary on Question:

Many candidates knew what zero condition members are but did not understand the reason for the bias. Many candidates did not specify that the bias against limited network and other lower cost plans is due to the revenue transfer formula.

Bias against zero-condition members.

Zero-condition members arise because

- a patient has a condition that is not part of the HCC mapping or
- because a patient is too new to the health plan to have claims, and therefore diagnoses have not yet been recorded in the patient record

Loss ratios for members with zero HCCs begin high for children and then decline at higher ages

6. Continued

Claims of young people are very high, relative to premiums. This result is counterintuitive because the rate compression at younger ages raises the relative cost of insurance for younger members and should make them a profitable cohort; the opposite is the case.

Bias against limited network and other lower cost plans.

- Limited networks tend to be lower cost leading to premiums lower than the state average.
- Limited network plans are less attractive to members with health conditions that require frequent provider visits. Therefore sicker, higher-risk members are less likely to choose limited-network plans.
- Revenue transfer is based on the overall statewide average premium which is higher than the premium for the lower cost/limited network plans, leading to inequities in transfer amounts.
- The fact that revenue transfers can exceed net income with no cap on the transfer amount is a serious issue to a number of plans.

- (c) Calculate the net income as a percent of premium for each plan assuming the network contract effects of Plan A and B are 0.900 and 1.100, respectively. Show your work.

Commentary on Question:

Most candidates performed less favorably on this part of the question, with only a few candidates adjusting the premium for the contracting differences.

	State	Plan A	Plan B	
Actuarial value (AV)	0.700	0.700	0.700	
Risk Score (PLRS)	1.000	0.918	1.082	
Rating Factor (ARF)	1.952	1.952	1.952	
Induced Demand (IDF)	1.020	1.020	1.020	
Geographic cost factor (GCF)	1.000	1.000	1.000	
Network contract effect		0.900	1.100	
Premium (priced at 100% loss ratio)	\$500.00	\$450.00	\$550.00	
Risk x Ind. Demand x Geog.	1.020	0.936	1.104	
Normalized		0.918	1.082	
Members	2,000	1,000	1,000	
Premium	\$12,000,000	\$5,400,000	\$6,600,000	Prem x members x 12
Claims	\$12,098,400	\$4,957,200	\$7,141,200	Prem x normalized risk factor
Gain/(Loss)	-\$98,400	\$442,800	-\$541,200	Prem - Claims
Funds Transfer		-\$492,000	\$492,000	(Other plan - plan)/2
Net Income		-\$49,200	-\$49,200	Gain/loss + Funds transfer
Net Income as a percent of premium		-0.91%	-0.75%	Net Income/Premium

6. Continued

- (d)
- (i) Describe the scope and applicability of ASOP 23, Data Quality.
 - (ii) Explain elements that should be included in any actuarial communication regarding work specifically subject to ASOP 23.

Commentary on Question:

Many candidates performed well on this part of the question and demonstrated a good understanding of ASOP 23.

- di. Scope and applicability—This ASOP provides guidance to actuaries for
- (a) selecting data, (b) performing a review of data, (c) using data, or (d) relying on data supplied by others, in performing actuarial services.
 - The ASOP also applies to actuaries who are selecting or preparing data, or are responsible for the selection or preparation of data, that the actuary believes will be **used by other actuaries** in performing actuarial services
 - When making appropriate disclosures with regard to data quality.
 - If an actuary prepares data, or is responsible for the preparation of data, to be used by other actuaries in performing actuarial services, the actuary should apply the relevant portions of this standard as though the actuary were planning to use the data, taking into account the preparing actuary's understanding of the assignment for which the data will be used.
 - This standard does not apply to the generation of a wholly hypothetical data set.
 - This standard does not require the actuary to perform an audit of the data.
 - If the actuary departs from the guidance set forth in this standard in order to comply with applicable law (statutes, regulations, and other legally binding authority), or for any other reason the actuary deems appropriate, the actuary should disclose this in accordance with ASOP 41.
- dii. Communications
- the source(s) of the data
 - any limitations on the use of the actuarial work product due to uncertainty about the quality of the data or other information relevant to the use of the data
 - whether the actuary performed a review of the data and, if not, the reason for not reviewing the data and any resulting limitations on the use of the actuarial work product
 - unresolved concerns the actuary may have about questionable data values that are relevant to the use of the data and could have a significant effect on the actuarial work product
 - discussions of any significant steps the actuary has taken to improve the data due to identifying questionable data values or relationships

6. Continued

- significant judgmental adjustments or assumptions that the actuary applied to the data or to the results, or are known by the actuary to have been applied to the data, to allow the actuary to perform the analysis
- the existence of results that are highly uncertain or have a potentially significant bias which the actuary is aware due to the quality of the data or other information relevant to the use of the data
- the extent of the actuary's reliance on data and other information relevant to the use of the data supplied by others
- any material assumption or method prescribed by applicable law (statutes, regulations, and other legally binding authority);
- if the actuary states reliance on other sources and thereby disclaims responsibility for any material assumption or method selected by a party other than the actuary; and
- if, in the actuary's professional judgment, the actuary has otherwise deviated materially from the guidance of this ASOP.

7. Learning Objectives:

3. The candidate will understand how to evaluate healthcare intervention programs.

Learning Outcomes:

- (3a) Describe, compare and evaluate programs.
- (3b) Estimate savings, utilization rate changes and return on investment.

Sources:

Managing and Evaluating Healthcare Intervention Programs, Ch. 9: Applying the Economic Model: The Example of Opportunity Analysis

Managing and Evaluating Healthcare Intervention Programs, Ch. 11: The Use of Propensity Scoring in Program Evaluation

Commentary on Question:

Most candidates performed well on parts (a) and (b) of the question. The alpha and beta coefficients for the logistic regression equation given in the question, were not provided to candidates, resulting in candidates' inability to answer parts (c) and (d) of the question. Consequently, all candidates received full credit for these two parts of the question.

Solution:

- (a)
 - (i) Define Opportunity Analysis.
 - (ii) Describe the purpose of Opportunity Analysis.
 - (iii) List the basic components required to perform Opportunity Analysis.
 - (iv) Define the key components in designing a care management program.
- (i) Opportunity Analysis – is a data-driven analytical process that extends traditional predictive modeling by matching opportunities within a client's populations to care management programs, products and services.
- (ii) Purpose – to demonstrate the potential clinical, financial and humanistic improvements that could result from the application of an appropriate evidence-based care management program.
- (iii) Basic components to perform an opportunity analysis are –
 - Knowledge of member benefit design;
 - Information on any evidence-based care management programs currently in place or that could reasonably be introduced, and
 - Eligibility and claims data for the prior 2 or 3 years

7. Continued

- (iv) Designing a program involves a combination of –
- Analytics (member segmentation)
 - Evidence (knowledge of what works and does not work, preferably from the peer-reviewed literature)
 - Economics (what is the cost of program delivery and expected return)
- (b) You are given the following population stratification for your company's care management program:

Condition Category	Population %	Cost %
Episodic, Mental Health, Chronic	12%	42%
Episodic and Mental Health	4%	7%
Episodic and Chronic	15%	27%
Episodic only	9%	7%
Mental Health and Chronic	5%	5%
Mental Health only	14%	6%
Chronic Only	5%	2%
Emerging Conditions	12%	3%
None	24%	1%
Total	100%	100%

Interpret findings from this data.

Episodic, Mental Health and Chronic

- Almost half (42%) of the total cost of the entire population is concentrated in the most complex condition category Episodic, Mental Health and Chronic which has about one-tenth (12%) of the members. Cost %age is about 3 times the Population %age.
- Episodic, Mental Health and Chronic is the most difficult segment to design programs or to manage.
- Any population management that avoids addressing the most complex patients will be doomed for financial failure.

Episodic and Chronic

- Is the 2nd most costly category at 27% of the cost, with about one-six (15%) of the population. Cost %age is about 2 times the Population %age.

Mental Health Only

- Cost %age (6%) is less than half the Population %age (14%)
- Higher-cost chronic members generally have episodic and mental health co-morbidities

7. Continued

Chronic Only

- Is the less costly condition category with 2% Cost %age, so is the least important category to include in a care management program

Emerging Conditions and No Conditions

- These two categories combined have about one-third of the population (12% +24%) while having only 4% (3% + 1%) of the cost

- (c) Calculate the propensity score for each treatment and control group member. Show your work.

Commentary on Question:

The following solution assumes a value for alpha and each of the three beta coefficients.

Alpha = 2, Beta 1 = -0.01, Beta 2 = 0.1, Beta 3 = -0.001

Control Member 1

$$\exp[2 - 0.01 \times 30 + 0.1 \times 0 - 0.001 \times 600] / (1 + \exp[2 - 0.01 \times 30 + 0.1 \times 0 - 0.001 \times 600]) = .750$$

Control Member 2

$$\exp[2 - 0.01 \times 55 + 0.1 \times 1 - 0.001 \times 820] / (1 + \exp[2 - 0.01 \times 55 + 0.1 \times 1 - 0.001 \times 820]) = .675$$

Treatment Member 1

$$\exp[2 - 0.01 \times 40 + 0.1 \times 1 - 0.001 \times 780] / (1 + \exp[2 - 0.01 \times 40 + 0.1 \times 1 - 0.001 \times 780]) = .715$$

Treatment Member 2

$$\exp[2 - 0.01 \times 60 + 0.1 \times 0 - 0.001 \times 680] / (1 + \exp[2 - 0.01 \times 60 + 0.1 \times 0 - 0.001 \times 680]) = .673$$

- (d)
- Calculate the difference in age between treatment and control members, prior to and after matching, using the Caliper Matching method. Show your work.
 - Calculate the difference in credit score between treatment and control members, prior to and after matching, using the Caliper Matching method. Show your work.

7. Continued

Average age of treatment members before matching = $(40 + 60)/2 = 50$

Average credit score of treatment members before matching = $(780 + 680)/2 = 730$

Average age of control members before matching = $(30 + 55)/2 = 42.5$

Average credit score of control members before matching = $(600 + 820)/2 = 710$

Distance between Treatment Member 1 and Control Member 1 = $\text{abs}(0.715 - 0.750) = 0.035$

Distance between Treatment Member 1 and Control Member 2 = $\text{abs}(0.715 - 0.675) = 0.040$

Distance between Treatment Member 2 and Control Member 1 = $\text{abs}(0.673 - 0.750) = 0.077$

Distance between Treatment Member 2 and Control Member 2 = $\text{abs}(0.673 - 0.675) = 0.002$

Treatment Member 1 should be matched with Control Member 1 since the difference in propensity scores is 0.035, which is within the fixed distance of 0.037

Treatment Member 2 should be matched with Control Member 2 since the difference in propensity scores is 0.002, which is within the fixed distance of 0.037

Average age of treatment members after matching = $(40 + 60)/2 = 50$

Average credit score of treatment members after matching = $(780 + 680)/2 = 730$

With each control member being used in the matching

Average age of control members after matching = 42.5

Average credit score of control members after matching = 710

8. Learning Objectives:

1. The candidate will understand how to evaluate and recommend an employee benefit strategy.

Learning Outcomes:

- (1a) Describe structure of employee benefit plans and products offered and the rationale for offering these structures.
- (1b) Describe elements of flexible benefit design and management.

Sources:

The Handbook of Employee Benefits, Ch. 18: Selected Additional Benefits: Educational Assistance Programs, Group Legal Services Plans, Qualified Transportation Fringe Benefits, and Voluntary Benefits

The Handbook of Employee Benefits, Ch. 32: Employee Benefit Plans for Small Companies

Consumers to the Rescue? A Primer on HDHPs and HSAs, Health Watch, Feb 2019

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe advantages of using voluntary benefits to address employee retention.

Commentary on Question:

Majority of candidates scored well on this part of the question. In addition to the responses shown below, others consistent with the source material were accepted.

- Voluntary benefits are advantageous for employers because they can be viewed as offering more benefits without significant added cost to their bottom lines.
- Voluntary benefits may be used to replace or supplement employer sponsored benefits that have been reduced or eliminated.
- The benefits can act as an employee recruitment or retention tool with employers paying only for administrative costs.
- Some companies are making available voluntary and work-life benefits (such as flex time) to employees that meet performance targets.

8. Continued

- (b) The CEO sends you an email with the following suggestions on how a voluntary benefits program should be structured:
- (i) The employer will contribute a flat amount for every employee
 - (ii) Employees are automatically enrolled in the program
 - (iii) The program will have the full endorsement of the employer
 - (iv) The employer will publicize the program to employees
 - (v) Premiums are collected in cash
 - (vi) The CEO is to receive a consulting fee which is over and above normal administrative costs for the program

Explain whether each of the CEO's suggestions allows for a voluntary benefits program to be excluded from ERISA governance. Justify your response.

Commentary on Question:

Credit was given for responses that answered for each suggestion individually and/or in aggregate.

- (i) This suggestion does not allow the program to be excluded from ERISA governance. The employer cannot make any contributions.
- (ii) This suggestion does not allow the program to be excluded from ERISA governance. Participation in the program must be completely voluntary for employees.
- (iii) This suggestion does not allow the program to be excluded from ERISA governance. The employer is not allowed to endorse the program.
- (iv) This suggestion does not allow the program to be excluded from ERISA governance. The employer can permit the insurer to publicize the program to employees or members, but the employer cannot publicize the program themselves.
- (v) This suggestion does not allow the program to be excluded from ERISA governance. The premiums should be collected through payroll deductions or dues checkoffs.
- (vi) This suggestion does not allow the program to be excluded from ERISA governance. The employer should receive no consideration in connection with the program other than reasonable compensation for administrative services.

As a result, the CEO's suggestions do not allow the program to be excluded from ERISA governance.

8. Continued

- (c)
- (i) Describe considerations when designing a group medical plan for your employer.
 - (ii) Describe pricing and plan design trends a small company should consider when offering group medical.

Commentary on Question:

Few candidates answered part (i) specific to small employers. Most candidates performed well on part (ii).

- (i)
 - Small companies are most often fully insured, they are subject to state mandated plan design options
 - Employees of small companies are in a relatively small geographical area, plans must be designed using options available in the area
 - Small companies need to provide documentation that they are an actual company and not a group of people banding together to purchase insurance
 - As of the writing, most states do not allow companies and organizations to band together to form larger purchasing pools in order to get group discounts
- (ii)
 - Marginal cost difference between a POS plan and an HMO plan may be small in some geographic areas. Some carriers have stopped offering HMO plans and only offer POS plans.
 - Some smaller employers are moving from higher-cost PPOs to a DPOS plan.
 - HMOs and PPOs need a referral to see a specialist in the network. DPOSs are less restrictive in this area. DPOSs may require an insured to pick a PCP at enrollment, generally they do not require their PCP's referral to see an in-network specialist
 - Many small employers are turning to CDHPs to control medical costs
- (d) Describe proposed legislative improvements for expanding HSAs in the following areas:
 - (i) Contributions to HSAs
 - (ii) Major medical use of HSA funds
 - (iii) Nonmajor medical use of HSA funds

8. Continued

Commentary on Question:

Most candidates were able to list proposed improvements, but very few expanded upon them with a description.

(i)

- Allow Contributions to Match the Out-of-pocket Maximum
 - The maximum contribution amount for an HSA is about half of the maximum out-of-pocket limitation for HDHPs. This means an individual enrolled in a lean HDHP may be paying for a significant portion of costs with dollars that are not tax-advantaged.
- Allow Spousal Catch-up Contributions in Family HSAs
 - Currently, only one spouse can make contributions to an HSA starting at age 55 when both spouses are enrolled in the same plan. Allowing both spouses to make catch-up contributions would remove this “marriage penalty” and allow for greater savings.

(ii)

- Allow use of HSAs for Health Care Premiums
 - Currently, HSAs cannot fund premium payments. However, the ability to use HSA funds to pay for other coverage could result in increased uptake of insurance in the individual market.
- Allow use of HSAs for Over-the-counter Health Supplies
- Allow use of HSAs for Direct Primary Care Arrangements

(iii)

- Allow use of HSAs for Fitness Equipment
 - In theory, allowing individuals to use HSA funds to encourage wellness would be offset by significantly reduced health expenses associated with healthier living.
- Allow use of HSAs to Pre-fund Long-term Care Needs
 - If HSAs can be expanded to accommodate LTC costs, they may be able to be part of the solution to a pressing need.