CURATED PAST EXAM ITEMS
- Solutions -

GH 301 – Health Analytics and Management

Important Information:

- These curated past exam items are intended to allow candidates to focus on past SOA fellowship assessments. These items are organized by topic and learning objective with relevant learning outcomes, source materials, and candidate commentary identified. We have included items that are relevant in the new course structure, and where feasible we have made updates to questions to make them relevant.
- Where an item applies to multiple learning objectives, it has been placed under each applicable learning objective.
- Candidate solutions other than those presented in this material, if appropriate for the context, could receive full marks. For interpretation items, solutions presented in these documents are not necessarily the only valid solutions.
- Learning Outcome Statements and supporting syllabus materials may have changed since each exam was administered. New assessment items are developed from the current Learning Outcome Statements and syllabus materials. The inclusion in these curated past exam questions of material that is no longer current does not bring such material into scope for current assessments.
- Thus, while we have made our best effort and conducted multiple reviews, alignment with the current system or choice of classification may not be perfect. Candidates with questions or ideas for improvement may reach out to education@soa.org. We expect to make updates annually.

Group and Health Course 301
Curated Past Exam Solutions
Learning Objective #1: Provider Contracting and Reimbursement
Applicable SOA Questions: Fall 2020 to Fall 2024
Solutions

Contents

1. Fall 2020 DP-A #2

SOA Commentary on Question:
Commentary listed underneath question component.

Part a:

Source(s): GH301-100-25 – Evaluating Bundled Payment Contracting
Question: List reasons why providers may choose to participate in bundled payment contracts.

SOA Commentary on Question:
This question asks for the rationale of providers choosing these contracts. The most common mistake was to list reasons the payors might favor these plans.

SOA Answer:
Bundled payment contracts provide the following benefits to providers:

- Attracting more business, including business from self-pay patients, medical tourism and payor contracts.
- Enhancing the engagement of physicians who might otherwise split their admissions among several hospitals
- Gaining the cooperation of physicians in reducing cost

Part b:

Source(s): GH301-100-25 – Evaluating Bundled Payment Contracting
Question: Calculate a bundled payment rate for hip replacement surgery that would reduce ABC's average cost by 10%. Show your work.

SOA Commentary on Question:
The most common oversight was forgetting to include the cost of the hip replacement surgery, in addition to the ancillary costs, in the calculation and the resulting bundled rate.

SOA Answer:
Calculate the average price for ancillary services associated with hip replacement surgery:

Emergency Department total cost = 1,500* 225 / 1,000 = 337.5
+ Inpatient Acute Stay = 20,000 * 100 / 1,000 = 2,000
+ Skilled Nursing Facility = 16,000 * 200 / 1,000 = 3,200
+ Long Term Care Facility = 85,000 * 10 / 1,000 = 850

Total ancillary services = $6,387.50

Hip Replacement Surgery = 35,000 (given)

Total Cost = 6,387.50 + 35,000 = 41,387.5
Apply 10% Savings = 41,387.5 * (1-10%) = **37,248.75**

Part c:

Source(s): GH301-100-25 – Evaluating Bundled Payment Contracting
Question: Calculate the percentage reduction in utilization of related services implied by the proposed bundled payment rate. State your assumptions. Show your work.

SOA Commentary on Question:

Most candidates who were unable to derive a result for part (b) were unable to provide a solution for this part. The derivation requires the candidate to recognize that the savings are derived solely from the ancillary services and the cost of the surgery remains unchanged.

SOA Answer:

Assume that the cost of the hip replacement surgery remains unchanged at $35,000. The cost of the ancillary services declines from the unbundled price of $6,387.50 to the bundled price of $2,248.75.

(6,387.50-2,248.75)/6,387.50 = **64.8% reduction.**

Part d:

Source(s): GH301-101-25 – Avoiding Unintended Incentives in ACO Payment Models
Question: Calculate the cumulative marginal revenue that will result from XYZ performing one additional hip replacement surgery in 2020 at a unit cost of $35,000. Show your work.

Commentary on Question:

This question asks for the cumulative marginal revenue which includes 3 years of the contract. The revenue generated from the additional surgery is included in the marginal revenue amount as that is how the example is shown in the source material.

SOA Answer:

The response assumes no trend and no change in membership or risk over the three year period 2018-2020.
All values are displayed in thousands.
The original benchmark is derived by summing the products of the benchmark weights times the annual spending.
Original Benchmark = 0.05*1,000 + 0.35*1,050 + 0.60*1,025 = 1,032.5
The revised benchmark is derived by adding the cost of one additional hip surgery ($35,000) to 2020 and then recalculating the benchmark.
Revised Benchmark with one 35k additional hip surgery in 2020 = 0.05*1,000 + 0.35*1,050 + 0.60*(1,025+35,000/1,000) = 1,053.5
The impact of the additional surgery is calculated as the difference between the benchmarks.
1,053.5 – 1,032.5 = 21
The cumulative marginal revenue is:
21 * 0.5 (shared savings factor) * 3 (years of agreement) + 35 (surgery revenue) = **$66.5k**

Part e:

Source(s): GH301-101-25 – Avoiding Unintended Incentives in ACO Payment Models
Question: Critique the proposed shared savings agreement.

SOA Commentary on Question:

Candidates needed to provide a critical assessment of both the result from part d and, more generally, the proposed bundled payment. The best responses included both a recognition of the short comings of the proposal, as well as proposed solutions.

SOA Answer:

The proposed savings agreement, with the heaviest weight in the final year, incentivizes XYZ to increase its costs in 2020 to increase their benchmark. To decrease this incentive, the benchmark should be changed to be based on equal weights for the three benchmark years or expanded to include additional years to mitigate one year's impact.

There are several other ways that this proposal could be strengthened:

- Recognizing trend and risk member changes in the shared savings period.
- Introducing a "yardstick" competition to reflect the performance of other competing providers
- Instituting quality metrics to assure delivery care standards are maintained.
- Changing the arrangement so that it is two-sided and both parties participate in savings and losses.

2. Fall 2020 DP-A #4

Part a:

Source(s): Provider Payment Arrangements

Question: Compare and contrast the impact of population utilization changes to provider profits under the following payment models: Fee-for-service, Global capitation, Bundled payments

SOA Commentary on Question:

Most candidates discussed how utilization changes would impact the three payment models individually, however, most did not compare and contrast the utilization change impact relative to one another.

SOA Answer:

Fee-for-service and Global Capitation Payment Models

- Utilization changes can have an opposite or similar effect on provider profits under a fee-for-service versus global capitation payment model.
- As the utilization or volume of services increases, provider profits increase under a fee-for-service payment model, assuming negotiated fees with the payer are higher than variable costs, i.e. costs of paying services.
- Under a global capitation payment model, the provider is financially responsible for all of the care that the patient receives, so provider profit increases with decreasing utilization and decreases with increasing utilization.
- Under a fee-for-service model, if negotiated fees with the payer are lower than variable costs, utilization changes will have a similar effect on provider profits under both a fee-for-service and global capitation payment model.

Fee-for-service and Bundled Payment Models

- Utilization changes can have an opposite or similar effect on provider profits under a bundled payment model versus a fee-for-service model.
- Similar to a fee-for-service model, as the number of episodes increases, provider profits increase.
- Unlike a fee-for-service model and because a provider is incentivized to manage the entire episode of care including post-acute care under a bundled payment model, an increase in post-acute care, readmissions, or other services during an episode will decrease provider profits.

Bundled Payment and Global Capitation Payment Models

- Utilization changes can have an opposite or similar effect on provider profits under a bundled payment model versus a global capitation payment model.
- Under a bundled payment model and unlike a global capitation model, the provider is incentivized to increase the utilization or volume of episodes.
- Under a bundled payment model and similar to a global capitation payment model, the provider is incentivized to decrease services such as post-acute care utilization or readmissions during an episode, to drive increased profits.

Part b:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's

Question: Compare and contrast the shared savings tracks available to accountable care organizations (ACOs) under the Medicare Access and CHIP Reauthorization Act (MACRA).

SOA Commentary on Question:

Many candidates were able to define the four shared savings tracks. Many candidates did not compare and contrast the savings tracks.

SOA Answer:

Compare

All tracks have gainsharing potential
All tracks have limitations with respect to gainsharing and loss sharing
An ACO can move to a higher track but cannot revert to a lower track

Contrast

Track 1 is one-sided (gainsharing only) whereas Tracks 1+, 2, and 3 are two-sided
Gainsharing potential increases with each track:

- Tracks 1 and 1+ include up to 50% gainshare with a maximum gainshare equal to 10% of benchmark costs
- Track 2 includes up to 60% gainshare with a maximum gainshare equal to 15% of benchmark costs
- Track 3 includes up to 75% gainshare with a maximum gainshare equal to 20% of benchmark costs

Loss sharing potential increases with each track:

- Track 1+ loss sharing is limited to 30% of losses and 4% of benchmark costs or 8% of fee-for-service revenues
- Track 2 loss sharing is between 40% and 60% of losses and limited to between 5% and 10% of benchmark costs
- Track 3 loss sharing is between 40% and 75% of losses and limited to 15% of benchmark costs

Part c:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's

Question: Calculate the earned performance payment to SACO. Show your work.

SOA Commentary on Question:

Many candidates did not average the three years of benchmarks contained in the case study. Full credit was given to candidates who evaluated shared savings on a PMPM or PMPY basis as long as a performance payment in total was calculated.

SOA Answer:

Historical Benchmark = ($955 + $1,010 + $1,110) / 3 = $1,025
Risk Ratio = 1.15 / 1.25 = 0.92
Risk Adjusted Historical Benchmark = 0.92 * $1,025 = $943
Risk Adjusted Benchmark Plus Trend = $943 * 1.0 = $943
Total Risk Adjustment Benchmark = $943 * 12 * 10,500 = $118,818,000

Total Expenditures = $11,100 * 10,500 = $116,550,000
Total Savings = $118,818,000 - $116,550,000 = $2,268,000
Minimum Savings = 0.03 * $118,818,000 = $3,564,540
Total savings are less than the minimum savings rate, so there are neither shared savings nor shared losses to SACO under the one-sided model. The earned performance payment to SACO is $0.

3. Fall 2020 DP-A #6

SOA Commentary on Question:

This question tests the candidate's understanding of how and why health plans contract with physicians. On parts (a) and (b), candidates did fairly well, as these points were clearly laid out in the required reading. Many candidates struggled with the calculations and did not do as well at providing recommendations to mitigate the impact of the contracting change to the physician group.

Part a:

Source(s): GH301-105-25 – Management of Provider Networks
Question: List reasons why a health plan would enter into a contract with physician groups.

Additional Comments on Question:

At the time this question was asked the answer provided below was a direct list from the source material. That source material has been replaced, however the topic is still generally covered on this learning objective. Therefore, answers to this question would require candidates to apply general knowledge about provider networks to get adequate answers.

SOA Commentary on Question:

Generally, candidates did very well on this part of the question, as this list was outlined in the required reading. The list below is not comprehensive, but is an example that would receive full credit.

SOA Answer:

A health plan would enter into a contract with a physician group:

- To obtain favorable pricing
- To get the provider to provide services to the health plan's members
- To meet adequacy standards in the service area
- To obtain agreements on items required by Medicare and/or by the state such as no balance billing or a hold harmless clause.

Part b:

Source(s): GH301-105-25 – Management of Provider Networks
Question: List provider types with which a health plan contracts.

SOA Commentary on Question:

None

SOA Answer:

Types of providers include:

- Doctors, hospitals, nursing homes, therapists, pharmacies, and durable medical equipment providers
- Primary care physicians (PCPs) and specialty care physicians (SPCs)
- Hospital-based providers – these include radiology, anesthesiology, pathology, emergency medicine, hospitalist physicians, and laboratory technicians

Part c:

Source(s): GH301-105-25 – Management of Provider Networks

Question: Calculate the per member per month (PMPM) financial impact of the benefit change to SFHP from 2020 to 2021. Show your work.

SOA Commentary on Question:

Candidates receiving full credit calculated the PMPM impact due solely to the change in copays. Candidates whose PMPM impacts included the effect of changing utilization trend and/or changing Physicians First utilization percentage received partial credit.

SOA Answer:

Step 1: trend 2019 utilization to 2021
Step 2: allocate utilization between Physicians First and Dynamic Doctors
Step 3: calculate 2021 copays PMPM by plan using the 2020 copays
Step 4: calculate 2021 copays PMPM by plan using the proposed 2021 copays
Step 5: calculate total average copay under each copay structure
Step 6: calculate the difference in copays

	A	B	C	D	E
Plan	Projected 2021 Average Enrollment	2019 Utilization per 1000 Members	2021 Utilization % at Physicians First	2021 Copays - Physicians First	2021 Copays - Dynamic Doctors
A	30,000	4,800	55%	$10	$15
B	20,000	5,500	100%	$0	N/A
C	10,000	5,000	50%	$15	$15

F =B x (1+1%)^2	G =F x C	H =F - G	J =($15 x F) / (1000 x 12)	K =(G x D + $15 x H) / (1000 x 12)
2021 Util per 1000	2021 Physicians First Util	2021 Dynamic Doctors Util	2020 Copay PMPM	2021 Copay PMPM
4,896	2,693	2,203	$6.12	$5.00
5,611	5,611	0	$7.01	$0.00
5,101	2,550	2,550	$6.38	$6.38
		Total	$6.46 =SUMPRODUCT(A,J)/SUM(A)	$3.56 =SUMPRODUCT(A, K)/SUM(A)

PMPM Difference $6.46 - $3.56 = **$2.90**

The financial impact of the benefit change is a $2.90 PMPM increase to SFHP's paid claims.

Part d:

Source(s): GH301-105-25 – Management of Provider Networks

Question: Calculate the percentage fee schedule change required for Physicians First such that SFHP remains financially neutral. Show your work.

SOA Commentary on Question:

There were multiple paths to full credit for this question depending on which copays were used to develop allowed amounts and whether utilization trend was applied. Partial credit was awarded to candidates who calculated the fee schedule change on a paid basis.

SOA Answer:

Step 1: calculate allowed cost per visit (paid + copay)

Step 2: calculate 2021 visits by physician group, based on enrollment, trended utilization, and utilization splits between Physicians First and Dynamic Doctors

Step 3: calculate 2021 total allowed cost by physician group before the 3% contract change to Dynamic Doctors

Step 4: apply the 3% contract change to find the allowed cost for Dynamic Doctors

Step 5: find the difference in Dynamic Doctors allowed costs

Step 6: divide step 5 difference by the Physicians First allowed cost to find the required reduction

	A	B	C	D	E	F	G
				2021 Copays		2019 Net Paid Cost Per Visit	
Plan	Projected 2021 Average Enrollment	2019 Utilization per 1000 Members	2021 Utilization % at Physicians First	Physicians First	Dynamic Doctors	Physicians First	Dynamic Doctors
A	30,000	4,800	55%	$15	$15	$85	$90
B	20,000	5,500	100%	$15	$15	$80	$85
C	10,000	5,000	50%	$15	$15	$75	$82

		K	L			
H	J	= A x [B x (1.01)^2 / 1000] x	= A x [B x (1.01)^2 / 1000] x (1-	M	N	P
=$15 + F	=$15 + G	C	C)	=H x K	=J x L	= N x (1+3%)

2019 Allowed/Visit		2021 Visits		2021 Total Allowed Before Contract Change		2021 Total Allowed After Contract Change
Physicians First	Dynamic Doctors	Physicians First	Dynamic Doctors	Physicians First	Dynamic Doctors	Dynamic Doctors
$100	$105	80,792	66,102	$8,079,192	$6,940,760	$7,148,983
$95	$100	112,211	0	$10,660,045	$0	$0
$90	$97	25,503	25,503	$2,295,225	$2,473,743	$2,547,955
			Total	$21,034,462 =SUM(M)	$9,414,503 =SUM(N)	$9,696,938 =SUM(P)

Difference in Dynamic Doctor's Allowed Cost	$9,696,938 - $9,414,503 = $282,435
Reduction required for Physicians First	$282,435 / $21,034,462 = **1.34%**

Part e:

Source(s): GH301-105-25 – Management of Provider Networks

Question: Recommend actions Physicians First could take to mitigate the impact of the contract change. Justify your response.

SOA Commentary on Question:

Several candidates made recommendations that were not actionable from a provider group's perspective (e.g. increase copays). An understanding of how a physician group might offset a reduction in payments was essential. No credit was awarded for recommendations that were payor-centric.

SOA Answer:

Physicians First might mitigate the reduction in payment by:

- Negotiating for rate increases with other health plans to offset the loss in revenue with SFHP.
- Reducing administrative expenses and increasing process efficiency.
- Increasing marketing and advertising in an attempt to increase patient volume

4. Fall 2020 DP-A #8

SOA Commentary on Question:

In general candidates did poorly on this question when not asked to provide a list or examples.

Part a:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's

Question: List the ways Accountable Care Organizations (ACOs) are expected to generate savings.

SOA Commentary on Question:

This question tested the candidate's ability to retrieve a list from the required reading. Overall, candidates who attempted the question did well.

SOA Answer:

- Implement "care coordination" to manage the care of the patients who need additional services.
- Access to integrated medical records and consistent management by the physician will reduce the need for tests.
- The ACO will develop a network of efficient providers for referrals and will limit the use of less efficient and more expensive providers.
- The focus on quality will also result in fewer unnecessary services, and by emphasizing preventive services, lead to later savings as population health is improved.

Part b:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's

Question: Compare and contrast disease management programs and ACO savings programs.

SOA Commentary on Question:

This question required candidates to synthesize differences and similarities between disease management programs and ACOs. Often candidates listed characteristics of ACOs and DM programs, but did not highlight similarities and differences.

SOA Answer:

Similarities:

- Both generate savings (or reduce costs) and focus on quality
- Both need quality data and analytics
- Importance of planning and understanding the saving opportunity
- Both likely delegate the care to remote nurses

Differences:

- DM programs have more mature data analytics than ACOs due to the ACO's heavy dependence on EMR/EHR records.
- CMS is more willing to wait for ACO savings than commercial payers would from DM programs because of the 3 year commitment required from ACOs.
- The relatively small size of ACOs compared to disease management programs will make savings more difficult to realize.

- In order to realize savings, ACOs must focus more heavily on patients with the greatest opportunity for cost reduction.
- Savings programs from ACOs will be provider-driven, as opposed to insurer-driven.
- ACO savings programs focus primarily on quality, as opposed to DMs focusing on both cost and quality.
- Care management programs in ACOs are newer than DM programs, so literature on these programs is limited.
- ACOs initial set-up cost is more significant
- ACOs focus on total health while DMs focus on chronic diseases
- ACO is a shared savings program, measured against a benchmark
- ACO members are attributed, as opposed to enrolled.

Part c:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's
Question: Describe the updates to the ACO gain share calculation from the final rules published in 2015 and 2016.

SOA Commentary on Question:

Most candidates who attempted this question were able to list the change to equal weighting of the years used to calculate the benchmark. However, candidates had difficulty listing other updates to the ACO gain share calculation.

SOA Answer:

- CMS now equally weights all years for calculating the benchmark.
- Savings in the prior performance period will be accounted for in the benchmark calculation in the first year of the performance period.
- In the second performance period, an ACO's rebased benchmark will reflect its performance in relation to other providers in the same regional market.
- After the second year of a performance period, the national trend factor is replaced with a regional trend factor.
- Beginning in 2017, the national FFS calculation will include only assignable Medicare FFS beneficiaries and not all FFS beneficiaries

Part d:

Source(s): GH301-101-25 – Avoiding Unintended Incentives in ACO Payment Models, Duncan 22 (Risk) – Risk Adj: ACO's
Question: Describe how the updated final rules address unintended consequences of the ACO gain share calculation in place prior to the update.

SOA Commentary on Question:

Many candidates relisted answers from part (c) and did not discuss how the updated final rule addressed the unintended consequences from the original ACO gain share calculation.

SOA Answer:

- With equal weighting, the ACO is less likely to shift more expensive and elective services between years.

- Adding savings from the prior performance period will raise the average benchmarks and allow better performing ACOs to be rewarded for long term success.
- Using a regional trend and comparing on a regional FFS benchmark, combined with regional adjustments, will reward better performing ACOs based on other providers as opposed to comparing their own prior performance.
- Using assignable Medicare FFS beneficiaries will allow better tracking of regional ACO performance

5. Spring 2021 DP-A #2

SOA Commentary on Question:

Many candidates correctly described the payment models, but some misunderstood the performance risk component.

Part a:

Source(s): Provider Payment Arrangements

Question: Describe the utilization, technical, insurance, and performance risks for each of the following provider payment models, fee-for-service, global capitation, case rates.

SOA Answer:

Fee for service:

1. Utilization - For most services, the provider's profit increases as utilization increases. (Exceptions do exist, e.g. low Medicare reimbursements).
2. Technical - FFS has low technical risk because it is easy to implement and monitor.
3. Insurance - Providers have very low insurance risk since they are not focused on population health.
4. Performance - Risk is possible if nonspecific codes are not properly monitored. May be quality of care risk for the patient and the insurer, but not the provider.

Global Capitalization:

1. Utilization - Generally the opposite of FFS. The provider's profit will increase as utilization decreases.
2. Technical - Very high risk due to the complex nature of reimbursement. An organization typically receives one fee for all services provided which then must be allocated to the individual providers.
3. Insurance - All of the insurance risk from FFS is transferred to the provider. Provider is at risk if patients need more care than expected when setting capitation rate.
4. Performance - Provider is at high risk since it takes on all financial responsibility for patient care and services.

Case Rates:

1. Utilization - For admission rates, similar to FFS. Provider has incentive to reduce length of stay since they don't receive additional reimbursement for longer admissions.
2. Technical - Risk is relatively low due to the number of available payment models/tools.
3. Insurance - Provider is at risk for longer lengths of stay and outlier patients, but not for number of admissions.
4. Performance - Discharging patients too early to save money may result in readmissions which carry penalties under Medicare.

Part b:

Source(s): Provider Payment Arrangements

Question: Calculate Hospital A's 2020 reimbursement, Hospital B's 2020 reimbursement under the discount arrangement, Hospital B's reimbursement under a proposed case rate equal to $4,500 per birth. Show your work.

SOA Commentary on Question:

For part (i), some candidates failed to multiply the monthly capitation rate by 12. For part (ii), some candidates multiplied by 1 minus the % of billed charges rather than the % of billed charges. For part (iii), some candidates did not recognize the claim data represented three deliveries.

SOA Answer:

(i) 2020 Capitation = membership * PMPM * months
2020 Capitation = 5000 members * $2.00 PMPM * 12 months = $120,000

(ii) Allowed amount = Billed Amount * % Billed Charges

Billed Amount	% Billed	Allowed Amount
$5,000	65%	$3,250
$200	65%	$130
$1,500	65%	$975
$6,000	65%	$3,900
$3,000	65%	$1,950
$1,000	65%	$650
$7,000	65%	$4,550
$800	65%	$520
$5,000	65%	$3,250
Total		**$19,175**

(iii) Allowed Amount = # cases * cost per case
Allowed Amount = 3 cases * $4,500 per case = $13,500

Part c:

Source(s): Provider Payment Arrangements
Question: Calculate the DRG base rate such that GHI is reimbursed a total of $20,000 for the above claims. Show your work.

SOA Commentary on Question:

Some candidates did not recognize the claim data represented three deliveries and incorrectly added all DRG weights within the table. Other candidates did not understand that the base rate multiplied by the DRG weight results in the payment to the provider.

SOA Answer:

Total Allowed = sum (DRG Base Rate * DRG Weight) across all three claims
$20,000 = (Base Rate * 0.157) + (Base Rate * 1.053) + (Base Rate * 1.164)
$20,000 = 2.374 * Base Rate
Base Rate = $8,425

Part d:

Source(s): Provider Payment Arrangements

Question: List questions GHI should consider before finalizing the contract with Hospital B.

SOA Commentary on Question:

Most candidates performed well. The question was looking for the items below, but some candidates listed considerations in contracting bundled payments – credit was given for those as well. Credit was also given for relevant questions not listed in this model solution.

SOA Answer:

What types of unintended behaviors may occur due to incentives created by the payment model, and how may they jeopardize anticipated savings?

What other factors would jeopardize achievement of the forecasted results?

How will results achieved during the model test be replicated?

Will the structure and the dimensions of the payment model change over time?

Will there be a phased-in approach?

How will the payment model promote continuous improvement of the service delivery model and adapt accordingly?

How will the proposal impact GHI's utilization, technical, insurance, and performance risks?

Does the proposal make financial sense for both parties?

Are there any other payment models that would be more appropriate to consider?

Part e:

Source(s): Provider Payment Arrangements

Question: Propose a counter-offer to Hospital B. Justify your response.

SOA Commentary on Question:

Although GHI and Hospital B agreed to adopt a DRG-based reimbursement structure for 2021, some candidates proposed counter-offers with unrelated payment models or misunderstood the DRG-based reimbursement methodology. Several candidates provided a counter-offer from Hospital B's perspective instead of GHI – deductions were made in this scenario. Candidates receiving full credit provided multiple justifications for their proposal.

SOA Answer:

I recommend a counter offer of $8,481. Under DRG-based reimbursement, this would result in a total payment to Hospital B of $20,134, which is 5% higher than Hospital B's current reimbursement of $19,175. The base rate will continue to increase each year at 4%, beating GHI's projected healthcare cost trend and allows Hospital B to achieve efficiencies to profit. The offer will also include a stop loss threshold for catastrophic claims to make it more likely Hospital B will accept the lower base rate offer. The stop loss provision will offer Hospital B protection against insurance risk from longer, more intense patients.

6. Spring 2021 DP-A #4a-b

Part a:

Source(s): Provider Payment Arrangements

Question: Describe the elements and risks involved in a typical pay-for-performance arrangement.

SOA Commentary on Question:

Candidates had a general understanding of pay for performance (P4P). Candidates generally took one of two approaches to identify the risks: 1) explain how Utilization, Technical, Insurance and Performance risks applied; or 2) list risks from a list in the study materials which focused on risks to patient care rather than risks to providers. Partial credit was given for approach 2 since these responses did not fully identify the elements of P4P.

SOA Answer:

Quality outcomes must be achieved in order to trigger payments
Includes some sort of gain share component
May also include elements such as bonuses or withholds
Technical risk – significant technical risk for developing appropriate contract terms
Performance risk – associated with meeting quality targets and reducing spend below specified threshold

Part b:

Source(s): Provider Payment Arrangements

Question: Describe key features when evaluating pay-for-performance programs, including the Medicare Hospital Quality Incentive Demonstration (HQID).

SOA Commentary on Question:

Candidates did not perform well on this part. When candidates provided a response, it was often tied to measuring success from a patient care perspective rather than a provider perspective. Some candidates listed domains of quality, which earned partial credit under the Success Measures portion.

SOA Answer:

Population Target: Should the program focus on chronic diseases, acute care or preventive services or some combination thereof?
Payment Specifics: magnitude, frequency, and duration of incentives
Success Measures of Performance: domains of quality.
How to incorporate non-quality measures of performance like audits, feedback, surveys, etc.

The remaining parts of this question are no longer on this syllabus

7. Spring 2021 DP-A #6

SOA Commentary on Question:

This question tested candidates' ability to construct a tiered network health plan based on cost profiles of physicians, and provide detailed information on the assumptions, process, and data used.

Part a:

Source(s): GH301-102-25 – Physician Profiling

Question: Describe advantages and disadvantages of episode-based physician profiling.

SOA Commentary on Question:

Most candidates listed advantages and disadvantages; descriptions were required to earn full credit.

SOA Answer:

Advantages: Data is easy to collect making the calculations administratively feasible. Provides a standard of quality to compare across physicians.

Disadvantages: Including hospital costs may cause issues since physicians have little control over these costs. Providers may start to selectively see easy or low cost patients to increase their scores

Part b:

Source(s): GH301-102-25 – Physician Profiling; GH301-103-25 – Cost Profiling-Reliability

Question: Compare the purposes of physician cost profiling and episode-based profiling.

SOA Commentary on Question:

This part required candidates to compare concepts from two separate source materials. Candidates struggled to generate those connections.

SOA Answer:

Both are aimed at providing objective criteria to compare providers, in order to inform payer and patient decisions on which providers to see and how to contain costs

Cost profiling centers around provider cost efficiency, while episode based profiling focuses on quality measurement

Episode-based cost profiling goes beyond traditional methods of determining cost and quality by looking at how care was managed over an entire "episode", often consisting of a hospital stay and follow-up care. Episode-based profiling is more patient-centered and outcome-focused.

Data quality and accessibility can impact how scores are calculated and create issues or errors

Additional Answer:

- Episode-based profiling and cost profiling are each a step in the process of the 2nd generation of physician profiles
- 1st generation quality profiles were often based on population health and preventive service measures, such as HEDIS
- The 2nd generation profiling is episode-based, and it is predominantly used to promote quality of care and/or cost efficiency improvement. The episode profile is the basis for the 2nd generation profiles. Episode grouper software aggregates member's claim records into defined "episodes of care" using data-mining algorithms

- The cost profiles are then directly calculated from the claims that are grouped in the episode.

Part c:

Source(s): GH301-103-25 – Cost Profiling-Reliability
Question: Calculate the physician cost profile for physicians A, B, and C. Show your work.

SOA Commentary on Question:

This calculation was straightforward for most candidates.

SOA Answer:

		Physician A	Physician B	Physician C
Physician cost averages	J	318	316	372
Total cost average for all claims	K	337	337	337
Cost profile	J / K	**0.9427**	**0.9363**	**1.1046**

Part d:

Source(s): GH301-104-25 – Tiering in Healthcare; GH301-103-25 – Cost Profiling-Reliability
Question: Propose a 2-tiered cost sharing structure and assign each physician to a tier. State your assumptions. Justify your response.

SOA Commentary on Question:

Candidates were expected to create robust responses in accordance with the point value assigned to this part. Credit was given for defining the cost sharing amounts, separating higher-performing physicians into preferred tiers, and for explaining choices behind the tiering as well as the cost sharing amounts.

SOA Answer:

Tier 1 (preferred): Members pay 10% coinsurance
Tier 2 (non-preferred): Members pay 20% coinsurance
Providers A and B are assigned to Tier 1 (preferred), while Provider C and All Other Physicians are assigned to Tier 2 (non-preferred)
Providers A and B have cost profiles lower than average, meaning that they tend to be less costly than the industry. We should reward this behavior by encouraging members to see them with lower cost sharing.
Providers C and All Other have cost profiles above the average. We should steer members away from these providers to create savings.

Part e:

Source(s): GH301-104-25 – Tiering in Healthcare
Question: Explain how to develop a shift assumption: (i) Before implementation of a Tiered Network Health Plan (TNHP). (ii) After implementation of a TNHP.

SOA Commentary on Question:

Candidates did not seem familiar with the source material, but most were able to give reasonable answers.

SOA Answer:

(i) Before implementation when it is unknown how members will react to the creation of the tiers, a shift assumption can be developed using reasonable judgment based on the magnitude of the cost sharing differential between tiers. The higher the differential, the higher the shift is likely to be. Additionally, the shift assumption may depend on how well the network change is communicated. If plan members are aware of and understand the new structure, they will be more likely to shift to preferred providers.

(ii) After implementation, it may be possible to look at empirical data to see how many members who had been using non-preferred providers are now incurring claims with preferred providers. This data can be used to adjust the shift assumption if it differs from what was expected.

Part f:

Source(s): GH301-104-25 – Tiering in Healthcare
Question: Recommend a shift assumption. Justify your response.

SOA Commentary on Question:

A specific recommendation and a justification were required for full credit. Any reasonable shift assumption was accepted as long as the justification explained the choice.

SOA Answer:

I recommend assuming 50% of the population using Physician C and other physicians shift to Physician A and B (i.e. 6 members).

With 20% coinsurance structure, insured members will have to pay around double the cost for a visit to Physician C and other physicians, and this reduces their likelihood to continue with the less preferred tier.

However, due to geographic reasons, insured members may find it difficult to access Physician A and B and may still stick with the physician in the less preferred tier.

Physician C charges are a lot greater than physicians A & B and he/she may have higher quality of services. Insured members may still stick with the service in less preferred tier to maintain this quality of service.

Part g:

Source(s): GH301-104-25 – Tiering in Healthcare
Question: Calculate the impact of the TNHP on HIJ's costs using the proposed cost sharing structure, tier assignment, and shift assumptions. Show your work.

SOA Commentary on Question:

Most candidates were able to utilize the formula from the source material to calculate savings. Credit was also given to candidates who chose to solve the problem using first principles.

SOA Answer:

Claims under the Control of non-preferred Providers (N%)	55.1%	= total cost from non-preferred providers / total cost from all providers = $4,271 / $7,754
Shift	50.0%	from part F
Member Liability Differential (M%)	11.1%	= 1 - AV non-pref / AV pref = 1- (1-20%) / (1-10%) ; design from part d. *M represents savings to plan from utilization staying at non-preferred providers due to higher member cost share*.
Cost Differential Between Tier Providers (P%)	11.0%	= 1 – [net paid from preferred provider cost / net paid from non-preferred provider] = 1 – ($316.64*90%) / ($355.92*90%); *P represents savings to plan from utilization moving to preferred providers with lower costs*
Savings	6.1%	Savings = N% x [M% + Shift (P% - M%)]

Part h:

Source(s): GH301-104-25 – Tiering in Healthcare

Question: Recalculate the cost profiles and TNHP impact. Show your work. Explain how this impacts your proposed tiering and shift assumptions.

SOA Commentary on Question:

This part required repeating calculations from prior sections. Most candidates were able to adjust Physician C claims and recalculate the amounts. Some candidates failed to reproduce both the cost profiles and the Tiered Network savings.

SOA Answer:

New Cost Profiles		Physician A	Physician B	Physician C
Physician Cost Averages	J	318	316	$372 * 0.9 = 335
Total cost average for all claims (including new Phys C claims)	K	329	329	329
New cost profile	J / K	**0.966**	**0.959**	**1.019**

New Tiered Network Health Plan Savings		
Claims under the Control of non-preferred Providers (N%)	54.0%	= total cost from non-preferred providers / total cost from all providers = $4,085 / $7,568
Shift	50%	from Part F
Member Liability Differential (M%)	11.1%	= 1 - AV non-pref / AV pref = 1- (1-20%) / (1-10%) ; design from part d
Cost Differential between Tier Providers (P%)	7.0%	= 1 – [net paid from preferred provider cost / net paid from non-preferred provider] = 1 – [$316.60*90% / $340.40*90%]
Savings	4.9%	Savings = N% x [M% + Shift (P% - M%)]

The tiering can remain the same as Physician C's costs are still higher than average, but the cost sharing differential could be reconsidered since the cost difference is not as drastic.

The shift assumption would need to change, as members using Physician C would realize less of a cost savings from switching to a preferred provider after this reduction.

8. Fall 2021 DP-A #2b-c

Part b:

Source(s): Provider Payment Arrangements

Question: Propose two payment arrangements for Group 1 that minimize DEF's utilization risk and may be acceptable to Group 1. Justify your response.

SOA Commentary on Question:

For full credit on part (b) candidates needed to suggest two arrangements that would be accepted by a physician group that has acknowledged that they do not manage patient utilization, and state why it would be accepted and how it would minimize DEF's utilization risk. Many candidates received partial credit on part (b) as many either did not offer solutions that fit both criteria or failed to justify their responses from the perspective of both Group 1 and DEF. Credit was given for additional solutions as appropriate.

SOA Answer:

DRG/case rate – Group 1 is paid a flat rate based on the patient diagnosis often with outlier protections. Group 1 would be acceptable to such an arrangement as they are paid per admission; however, they are incentivized to reduce the length of stay and therefore limiting DEF's utilization risk.

Bundled payments – Group 1 is paid a flat rate based on an episodic need of the member. Group 1 would be acceptable to such an arrangement as they are paid per episode; however, they are incentivized to reduce the overall costs within the bundle and therefore limiting DEF's utilization risk.

Reference Pricing - In reference pricing, the employer or its health plan stipulates a benefit limit for a specific surgery or service, with the member paying any difference. Group 1 is acceptable as it is still paid FFS; however, DEF's utilization risk is controlled as members will be less likely to use Group 1 as their OOP costs increase.

Pay for Performance - P4P adjusts the payment arrangement to include incentives for higher quality of care and in some cases disincentives for lower quality. Group 1 will be amenable as they will be paid FFS; however, as physicians adhere to the quality metrics, DEF's utilization risk will decrease.

One-sided ACO/one-sided shared savings – An arrangement where Group 1 will be able to share in reductions in total cost of care without sharing in losses; Group 1 is amenable as they will not incur penalties for overutilization, but DEF's utilization risk is limited as Group 1 is incentivized to increase quality and lower costs.

Part c:

Source(s): Provider Payment Arrangements

Question: Evaluate the value, if any, of the Year 1 bonus payment due to Group 1. Show your work.

SOA Commentary on Question:

Candidates did very well on Part (c) with most earning full credit. Candidates needed to evaluate all three criteria for full credit as would be appropriate in returning a report of performance to a provider. Partial credit was awarded for candidates who did not check the third criteria after determining Group 1 failed the second criteria.

SOA Answer:

Criteria 1: Total episode costs must decrease 2% between Year 0 and Year 1
Total Episode Cost = sumproduct(% Total Episodes * Cost)
Year 0 Cost = (10% * $23,000) + (48% * $35,000) + (42% * $40,000) = $35,900
Year 1 Cost = (15% * $24,000) + (47% * $34,500) + (38% * $40,000) = $35,015
Decrease = Year 1 Cost / Year 0 Cost – 1 = $35,015/$35,900 – 1 = -2.5%
PASS

Criteria 2: Total episode costs must be at least 5% below the national average
Total Episode Cost = sumproduct(% Total Episodes * Cost)
Year 1 PCP Group 1 Cost = (15% * $24,000) + (47% * $34,500) + (38% * $40,000) = $35,015
Year 1 National Cost = (56% * $22,755) + (32% * $32,931) + (12% * $40,226) = $28,108
Cost Ratio = Year 1 APP Cost / Year 1 National Cost – 1 = $35,015/$28,108 – 1 = 24.6%
FAIL

Criteria 3: The complication rate must be below 7% in Year 1
Complication Rate = sumproduct(% Total Episodes * Complication Rate)
Year 1 Rate = (15% * 15%) + (47% * 6%) + (38% * 4%) = 6.6%
PASS

Since the PCP Group does not meet criteria 2, they are not eligible for the bonus.

9. Fall 2021 DP-A #4

Part a:

Source(s): GH301-105-25 – Management of Provider Networks
Question: Identify characteristics that impact a health plan's network access requirements.

SOA Commentary on Question:
Candidates generally did well on this part of the question and received full credit for providing the items.

SOA Answer:

- Need to improve the network's size to effectively compete against a larger plan
- Expansion of an HMO's service area
- The need to recruit new PCPs in areas where the plan's current PCPs have closed their practices to new members
- The need to improve access in areas with high concentrations of members/geography
- The need to have a network for an entirely new type of plan such as MA or managed Medicaid plan
- To satisfy a state or federal requirement to improve access to PCPs following a market conduct survey / network adequacy
- The need to contract with physicians who use a newly contracted hospital

Part b:

Source(s): GH301-105-25 – Management of Provider Networks
Question: Describe considerations of the typical contract negotiation process.

SOA Commentary on Question:
Most candidates struggled with this part and only received partial credit.

SOA Answer:

- Plan management must consider availability of choices based on competitive advantage
- Plan management should also consider cost of providing a wider network
- Several back-and-forth proposals occur between the plan and provider / negotiate
- Plan must consider profitability of certain service lines and procedures
- Each party will use its own data to come with proposals and counterproposals
- Disclosure of data to the other party is often done strategically
- Each party is expected to have expertise to understand impact of proposed terms
- First year of agreed upon contract is considered the "base year"
- Payments for subsequent years of a contract are based on the first year and often increase by a percentage amount / length of contract

Part c:

Source(s): GH301-105-25 – Management of Provider Networks
Question: Calculate the reimbursement Royale Health would owe for services provided in 2020 by: (i) Lynd. (ii) Paloma. Show your work.

SOA Commentary on Question:

Candidates generally performed well on this part and received full credit. Some candidates made minor calculation errors and received partial credit (e.g., did not correctly calculate the case rate + per diem with excess rates)

SOA Answer:

- Payment to Lynd / Paloma For Per Diem = ALOS * Per Diem Rate for Each Service
- Payment to Paloma For Case Rate + Per Diem with Excess = Case Rate + Per Diem Rate * max(ALOS - Covered Days, 0)
- Total Payment = Total Admits * Payment Per Admit

Lynd	**Per Admit**	**Total Admit**	**Payment**
NICU – Level I	$10,200	360	$3,672,000
NICU – Level II	$21,000	240	$5,040,000
NICU – Level III	$25,000	180	$4,500,000
NICU – Level IV	$30,000	180	$5,400,000
Maternity – Normal Delivery	$8,000	600	$4,800,000
Maternity – C Section	$12,000	450	$5,400,000
Total			**$28,812,000**

Paloma	**Per Admit**	**Total Admit**	**Payment**
NICU – Level I	$9,300	80	$744,000
NICU – Level II	$19,200	70	$1,344,000
NICU – Level III	$31,500	50	$1,575,000
NICU – Level IV	$41,400	30	$1,242,000
Maternity – Normal Delivery	$8,000	220	$1,760,000
Maternity – C Section	$13,200	160	$2,112,000
Total			**$8,777,000**

Part d:

Source(s): Provider Payment Arrangements

Question: Recommend modifications Royale Health should propose to the contract with Paloma. Justify your response.

SOA Commentary on Question:

Most candidates received about half credit for this part. Full credit was given for providing two or more of the following modifications with justifications.

SOA Answer:

- Use a flat case rate instead of per diem
  - Replace per diem reimbursement model with flat case rate that lowers the overall reimbursement level; this will incent providers to better manage inpatient stays
- Increase covered days for each service without adjusting case rates
  - Services that are subject to a reimbursement schedule on a per diem basis do not provide an incentive to providers to manage the inpatient stay – increase the number of covered days included in the case rate to encourage providers to better manage inpatient stays. Case rate should also consider that not all patients will remain hospitalized for the full duration of the covered days.
- Add another tier payment for days excess of covered days
  - Encourage providers to manage days in excess of covered days by introducing a reimbursement rate that decreases with duration
- Add a reimbursement schedule for preferred providers
  - Identify preferred providers (low cost, high quality) and adjust the reimbursement schedule to reward them for performance
- Change the reimbursement schedule to be based on percentage of admits
  - Modify the reimbursement schedule to reflect types of admits – in other words, providers will be encouraged to steer members to normal vaginal delivery over C-section (that is subject to a higher reimbursement level currently).
- Add a pay for performance component
  - Incent and reward providers for the outcome of care rendered (e.g., add in metrics such as readmission rate)
- Add a tiered network arrangement with Lynd and Paloma
  - Designate high performing (low cost, high quality) providers into the "preferred" tier to steer more utilization to those providers

10. Fall 2021 DP-A #6

Part a:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's
Question: List ways provider group-based accountable care organizations (ACOs) generate savings.

SOA Commentary on Question:
Candidates generally performed well on part a), with the majority earning full credit.

SOA Answer:

- The practice will implement "care coordination" to manage the care of patients who need additional services
- Access to integrated medical records and consistent management by the physician will reduce the need for tests
- The ACO will develop a network of efficient providers for referrals and will limit the use of less efficient and more expensive providers
- The focus on quality will result in fewer unnecessary services, and by emphasizing preventive services, lead to later savings as population health is improved

Part b:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's
Question: Compare and contrast ACOs and health maintenance organizations (HMOs).

SOA Commentary on Question:
Full credit was given if the candidate listed a couple of similarities and differences. Reasonable responses not listed below were also accepted.

SOA Answer:

Compare:

- Both ACOs and HMOs have patients assigned to them
- Both require providers to be accountable for providing quality care, reducing utilization, and convincing the patient not to seek care outside of the ACO provider network

Contrast:

- ACO is provider-based and less restrictive both in terms of network enrollment and utilization management
- Patient attribution in an ACO can happen through an algorithm whereas the HMO has positive enrollment and contractual ties

Part c:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's
Question: Compare and contrast ACOs and typical disease management (DM) programs.

SOA Commentary on Question:
Full credit was given if the candidate listed a couple of similarities and differences. Reasonable responses not listed below were also accepted.

SOA Answer:

Compare:

- Both rely on data and analytical resources to support their operations
- Both are focused on changing patient behavior in a way that produces a measurable financial outcome

Contrast

- ACOs are provider sponsored, whereas DM programs are typically sponsored by insurers
- ACOs typically lack the economies of scale and bandwidth to manage all the needs of a chronically-ill patient panel
- Data and analytics available to ACOs are less mature than those used by DM companies and the ACOs may have incomplete records
- Provider-driven programs (ACOs) may emphasize quality improvement first, whereas insurer-directed programs (DM) emphasize cost savings as well as quality improvement.

Part d:

Source(s): GH301-103-25 – Cost Profiling-Reliability

Question: Explain in the context of physician cost profiling: Validity and Reliability.

SOA Commentary on Question:

Candidates had more difficulty on part (d). Many candidates provided a non-descriptive definition, for which credit was not given (e.g., "Reliability represents how reliable the measure is."). Partial credit was awarded for part (ii) for candidates supplying the individual physician formula for reliability.

SOA Answer:

Validity: indicates how well a measure represents the phenomenon of interest – indicates whether the method of assigning episodes of care to physicians and creating summary scores accurately represents physicians' economic performance

Reliability: the proportion of variability in a measure that is due to real differences in performance – determined by three factors: (1) the number of observations, (2) the variation among physicians in their use of resources to manage similar episodes, and (3) random variation in the scores

Part e:

Source(s): GH301-103-25 – Cost Profiling-Reliability

Question: (i) Critique the physician cost classifications. (ii) Recommend changes to the cost classifications. Show your work. Justify your response.

SOA Commentary on Question:

Many candidates had difficulty with this part, making general statements about physician cost profiling without performing any supporting calculations. In order to receive full credit, candidates were expected to:

- *Calculate the unit cost for each physician*
- *Acknowledge the presence of outliers on both the low ($50 per episode) and high ($10,000 per episode) ends and exclude those physicians from being considered "low cost"*

- *Determine that in order to be classified as "Low Cost" the physician should have (1) a low unit cost (for example, $1,100), (2) a high reliability score (for example, greater than 0.7), and (3) a sufficient number of episodes (for example, greater than 1,000)*
- *Recommend changes to the classifications, if needed, for each physician based on the criteria above*

Other opportunities for partial credit in both parts (i) and (ii) include discussion of adequate reliability being in the range of 0.7 to 0.9, discussion of the low volume issue, and discussion of the outlier issue.

SOA Answer:

(i) Critique:

- Physician A: classified as low cost but reliability score is below commonly used thresholds (0.7 and 0.9)
- Physician C: classified as low cost, but unit cost is not amongst the lowest
- Physician F: classified as low cost, but unit cost is an outlier (use Winsorizing)
- Physician K: classified as not low cost, which appears to be an error based on reliability score > 0.7 and unit cost = $1,100
- Physician M: classified as low cost but reliability score is below commonly used thresholds (0.7 and 0.9)
- Physician Z: low volume (not reliable)

(ii) Recommend changes:

- Physician A: reclassify as not low cost due to low reliability score
- Physician C: reclassify as not low cost due to not having the lowest unit cost
- Physician F: reclassify as not low cost due to unit cost outlier
- Physician K: reclassify as low cost due to acceptable reliability score and low unit cost
- Physician M: reclassify as not low cost due to low reliability score
- Physician Z: reclassify as not low cost due to low episode count

Physician	Episode Count ('000s)	Total Cost ('000s)	Reliability Score	Cost Classification	Unit Cost	Revised Cost Classification
A	4.1	$4,510	0.44	Low Cost	$1,100	Not Low Cost
B	1.6	$80	0.7	Not Low Cost	$50	Not Low Cost
C	1.5	$3,150	0.8	Low Cost	$2,100	Not Low Cost
D	0.6	$660	0.02	Not Low Cost	$1,100	Not Low Cost
E	2.9	$29,000	0.32	Not Low Cost	$10,000	Not Low Cost
F	2.1	$105	0.89	Low Cost	$50	Not Low Cost
G	2.1	$4,410	0.5	Not Low Cost	$2,100	Not Low Cost
H	1.4	$2,940	0.26	Not Low Cost	$2,100	Not Low Cost
I	2	$4,200	0.3	Not Low Cost	$2,100	Not Low Cost
J	1.7	$1,870	0.16	Not Low Cost	$1,100	Not Low Cost
K	3.2	$3,520	0.8	Not Low Cost	$1,100	Low Cost
L	3.3	$6,930	0.48	Not Low Cost	$2,100	Not Low Cost
M	4.1	$4,510	0.06	Low Cost	$1,100	Not Low Cost
N	1.9	$5,890	0.76	Not Low Cost	$3,100	Not Low Cost
O	4.4	$44,000	0.12	Not Low Cost	$10,000	Not Low Cost
P	1.8	$1,980	0.89	Low Cost	$1,100	Low Cost
Q	0.8	$2,480	0.3	Not Low Cost	$3,100	Not Low Cost
R	2.5	$5,250	0.79	Not Low Cost	$2,100	Not Low Cost
S	4.3	$9,030	0.1	Not Low Cost	$2,100	Not Low Cost
T	3	$6,300	0.97	Not Low Cost	$2,100	Not Low Cost
U	0.8	$1,680	0.28	Not Low Cost	$2,100	Not Low Cost
V	4.4	$13,640	0.52	Not Low Cost	$3,100	Not Low Cost
W	1.3	$4,030	0.38	Not Low Cost	$3,100	Not Low Cost
X	1.7	$5,270	0.45	Not Low Cost	$3,100	Not Low Cost
Y	2.3	$23,000	0.02	Not Low Cost	$10,000	Not Low Cost
Z	0.3	$330	0.7	Low Cost	$1,100	Not Low Cost

11. Spring 2022 DP #5

SOA Commentary on Question:

The question covered Value Based Care and Tiered Network Health Plans, comparing and contrasting two different approaches to contract with providers in a manner to reward quality and drive savings.

Part a:

Source(s): Value-Based Care Framework
Question: Describe how Value Based Care (VBC) addresses each component of the Triple Aim of Healthcare.

SOA Commentary on Question:

Part (a) evaluated candidates' ability to link the various elements of Value Based Care. To receive full credit, candidates needed to state the three elements of the Triple Aim and describe "how" VBC addresses each rather than just stating VBC addresses each component.

SOA Answer:

Definition of the Triple Aim of Healthcare:

1) Improving the patient experience
2) Reducing per-capita medical spend
3) Improving the population's health

- VBC improves the patient experience through rewards for quality metrics and tying reimbursement to quality metrics
- VBC reduces costs by incentivizing providers to reduce costs (aligning incentives) through shared savings and capitation arrangements.
- VBC improves the population's health by directing members to higher quality providers, and assigning large member pools to providers encouraging patient engagement.

Part b:

Source(s): GH301-104-25 – Tiering in Healthcare, Value-Based Care Framework
Question: Compare and contrast VBC and Tiered Network Health Plans (TNHP).

SOA Commentary on Question:

Most candidates did well on part (b). To receive full credit, candidates needed to both compare and contrast. Credit was given for a range of additional responses beyond those provided below.

SOA Answer:

- Both VBC and TNHP differentiate preferred providers, while addressing costs in health care and rewarding high quality providers.
- TNHP directly involves the member, whereas VBC contracts are wide ranging in their complexity and often unknown to the patient.

Part c:

Source(s): GH301-104-25 – Tiering in Healthcare, Value-Based Care Framework

Question: Recommend a VBC or TNHP in each of the following scenarios. Justify your response.

(i) Market with limited PCP competition

(ii) New market for ABC with unknown costs

(iii) Mature market where PCPs are efficient with costs

SOA Commentary on Question:

Part (c) required the candidate to think critically through the implications of each scenario and apply a thorough understanding of VBC and TNHP to the scenario. Credit was given for any recommendation provided with an appropriate justification. Most candidates did well on (i).

SOA Answer:

(i) VBC: with limited PCP competition, there may not be enough providers to build out a tiered network.

(ii) TNHP: in a new market where existing provider baseline costs are unknown it would be difficult to establish benchmarks for shared savings and other VBC arrangements. A TNHP built off negotiated fee schedules using an independent fee schedule is simpler and less risky to ABC.

(iii) VBC: In a mature market where all PCPs are efficient, there would not be enough of a variance in costs across the PCPs to establish a TNHP. A VBC focusing on driving quality would be the most appropriate.

Part d:

Source(s): GH301-104-25 – Tiering in Healthcare

Question: Calculate Tier 1 and 2 coinsurance amounts that generate 5% savings through the TNHP. State your assumptions. Show your work.

SOA Commentary on Question:

Part (d) could be solved in two manners: first principles (often with goal seek) or formulaic. Both methods were given full credit for a correct response. Most candidates kept Tier 1 at the current 20% coinsurance. However, full credit was given if the final solution provided for Tier 1 coinsurance less than Tier 2, and the new coinsurance amounts resulted in a 5% savings on the shifted membership.

SOA Answer:

Formulaic: Assume Tier 1 remains at 20%

Formula: Savings = % Claims for non-pref physicians * [change in member liability + shift*(cost diff between providers - change in member liability)]
' 5% = N * Shift * P + N * (1-S) * M = N * (M + Shift * (P - M))

Formula for cost diff between providers: P% = 1 - pref cost/non-pref cost = 1-(2,500,000/300)/(4,900,000/500) = 15%=14.97%

%N = % claims for non-pref physicians = NonPreferred allowed/Total Allowed = 4.9M/(2.5M+4.9M)=66.2%

Solving for %M = 5.08%

M% = (1 - non-pref benefit/pref benefit)

Coins lower Tier: 1 - (1-Coins Top)*(1-(1/(1-Shift))*((Savings/N%) - Shift*P%)) = 1 - (1 - M) * (1 - 20%) = **24.06%**

First Principles:

	Total Allowed Claims	Members Assigned (Pre-Shift)	Allowed Claims PMPY	Coinsurance	Reimbursed
Tier 1: Preferred Providers	$2,500,000	300	$8,333.33 = $2.5M/300	20%	$6,666.67 = (1-20%)*$8,333.33
Tier 2: Non-Preferred Providers	$4,900,000	500	$9,800.00 = $4.9/500	20%	$7,840.00 = (1-20%)*$9,800
Total	**$7,400,000**	**800**			**$7,400.00 = ($6,666.67*300+$7,840*500)/800**

	Post – Shift Members	Allowed Claims PMPY	Coinsurance	Reimbursed
Tier 1: Preferred Providers	425	$8,333.33	20.00%	$6,666.67
Tier 2: Non-Preferred Providers	375	$9,800.00	**24.06% =1-$7,442.12/$9,800**	$7,442.12 =($7,030*800-425*$6,666,67)/375
Total	**800**			**$7,030 = .95*$7,400**

12. Spring 2022 DP #11

SOA Commentary on Question:

Candidates did well on the written response parts of the question – especially those that required providing lists. The differentiating part of the question was correctly trending revenue and claims in parts (e) and (g).

Part a:

Source(s): GH301-105-25 – Mgmt. of Provider Net.

Question: List the elements required of a health plan to manage a provider network.

SOA Commentary on Question:

Most candidates performed well on this question

SOA Answer:

- Articulate goals of the network
- Comply with applicable regulations
- Ensure quality standards are met
- Manage cost
- Manage risk
- Evaluate network on an ongoing basis

Part b:

Source(s): GH301-105-25 – Mgmt. of Provider Net.

Question: Describe the goals for the provider network from the perspective of: (i) Health plans (ii) Employers, (iii) Consumers (iv) Providers

SOA Commentary on Question:

To receive full credit for this question, candidates needed to describe at least two items for each of the stakeholder's perspectives. This is an illustrative response – other valid responses received credit. Most candidates did well on this part and provided 1 or 2 responses for each.

SOA Answer:

(i) Health plans

Financial stability – identify providers with stable practices who will be able to provider care for health plan's members

Membership growth – network needs to be broad enough and include desirable providers so the plan's products are attractive to purchasers

(ii) Employers

Balancing costs with employee satisfaction - narrow networks come with better discounts, thus lower costs, but fewer options for care

Provider disruption/continuity of care if moving carriers – employers generally want a network that includes providers their employees are currently using

(iii) Consumers
Having the providers in network – consumers generally don't want to change doctors but may be willing to trade reduced future access for lower premiums/costs
No surprise bills – consumers want a broad enough network that they can get care (surgeries, ER, etc.) without being exposed to OON providers for ancillary services

(iv) Providers
Earn a fair, predictable source of income while getting access to a large member base
Minimizing time on administrative functions and reimbursement appeals

Part c:

Source(s): GH301-105-25 – Mgmt. of Provider Net.
Question: Complete the following table for the member's claim:

	In-Network	Out-of-Network
Health Plan Liability		
Member Cost Sharing		
Provider Reimbursement		

Show your work.

SOA Commentary on Question:
The majority of candidates successfully completed the table for in-network and out-of-network. However, most candidates did not include the additional member cost sharing or the provider reimbursement for the balance billing that would take place with the out of network provider

SOA Answer:

	In-Network	Out-of-Network
Health Plan Liability	$1,120	$1,080
Member Cost Sharing	$280	$920
Provider Reimbursement	$1,400	$2,000

	In-Network		Out-of-Network	
Billed	$2,000		$2,000	
Allowed	$1,400	= Billed x 70%	$1,800	= Billed x 90%
Cost-Share	$280	= Allowed x 20%	$720	= Allowed x 40%
Plan Paid =	$1,120	= Allowed - Cost-Share	$1,080	= Allowed - Cost-Share
		Difference in Plan Paid	**$40**	
		Balance Billed Amount	$200	= Allowed - Billed
Member Paid =	$280		$920	
		Difference in Member Paid	**$640**	= Cost-Share + Balance Bill
Provider Receives	$1,400	= Allowed	$2,000	= Billed
		Difference in Provider Receives	**$600**	

Part d:

Source(s): GH301-105-25 – Mgmt. of Provider Net.
Question: An intern heard on the news that the COVID-19 pandemic was disruptive to provider networks and their administrators. Identify these disruptions.

SOA Commentary on Question:

Most candidates were able to identify at least a few of the below items in how the COVID-19 pandemic was disruptive to provider networks and their administrators. Acceptable items not listed in the source material received credit.

SOA Answer:

- Quarantines
- Hospital systems were overwhelmed
- New treatment protocols were rolled out
- How to reimburse for services attributable to COVID
- Increased us of Telehealth
- How to deal with deferred care
- Income losses

Part e:

Source(s): GH301-105-25 – Mgmt. of Provider Net.; Provider Payment Arrangements
Question: Calculate the projected 2022 gain sharing amount. Show your work.

SOA Commentary on Question:

Most candidates recognized the need to trend the revenue and claims forward to 2022. A majority of candidates did not recognize the need to translate the dollars to a PMPM/PMPY basis before doing

so. Most candidates understood how to provide the gain share once the 2022 revenue, claims, and admin were calculated. Some candidates referred to ACO benchmarking to answer this question which was not the intent.

SOA Answer:

2021 Rev PMPM	$1,040.00	1,248M / (12*100,000)
2021 Claims PMPM	$965.00	1,158M / (12*100,000)
2022 Rev PMPM	$1,081.60	1,040 * (1+4.0%)
2022 Claims PMPM	$993.95	965 8 (1+3.0%)
Admin Fee PMPM	$70.00	
Gain/(Loss) PMPM	$17.65	1,081.60 – 993.95 – 70.00
Gain Share @50% PMPM	$8.83	Take 50% for gain share
Avg Members	105,000	100,000 * (1+5.0%)
Gain Share $	$11,119,500	8.83 * 12 * 105,000

Part f:

Source(s): GH301-105-25 – Mgmt. of Provider Net.; Duncan 14 (Risk) – Risk Adj. - Medicare
Question: Recommend actions that can be taken to improve gain sharing performance by: DH and ARBT. Justify your response.

SOA Commentary on Question:

Most candidates were able to identify one or two actions that either DH or ARBT could implement to improve the gain sharing performance. Most candidates were not able to give a more comprehensive response.

SOA Answer

DH
Introduce new medical management programs – One of the goals of a gain sharing arrangement is for providers to deliver the most efficient care possible. DH should review how care is managed and coordinated for its patients and ensure no duplicative or unnecessary care is provided.
Improve risk adjustment (since MA) – By ensuring all diagnosis codes are correctly reported and documented, DH can maximize ARBT's revenue and ultimately the profitability of this arrangement.
ARBT
Inform retirees about health improvement programs – the plan sponsor is a key constituent and can work to educate/incent the plan enrollees to use the most appropriate care given individual needs. This will help lower overall medical costs, direct care to higher-performing providers, and increase the gain sharing that DH may receive.
Encourage retirees to utilize efficient, high quality providers – ARBT should educate its enrollees on the value provided by DH and encourage enrollees to use those providers. Doing so will increase volume at DH which may allow DH to more efficiently handle ARBT's enrollees

Part g:

Source(s): GH301-105-25 – Mgmt. of Provider Net.; Provider Payment Arrangements
Question: Assess whether or not ARBT should accept DH's offer. Show your work. Justify your response.

SOA Commentary on Question:

Acceptance or rejection of the offer was given credit so long as it was consistent with the calculations and justified.

SOA Answer:

2021 Rev PMPM	$1,040.00
2021 Claims PMPM	$965.00
2022 Rev PMPM	$1,081.60
2022 Claims PMPM	$984.30 = 965 * (1+2.0%)
Admin Fee PMPM	$75.00
Gain/(Loss) PMPM	$22.30
Gain Share @50% PMPM	$11.15
Avg Members	105,000
Gain Share $	14,049,000
Additional Admin Fee	$ 6,300,000
Increase in G/S	2,929,500

- ARBT should accept the offer since there is a net increase in margin for ARBT. This arrangement will increase ARBT's admin costs however the reduction in claim cost will offset the extra admin cost leading to a net gain for the group.

13. Fall 2022 DP #3

Part a:

Source(s): GH301-101-25 – ACO Payment Models, Duncan 22 (Risk) – Risk Adj: ACO's
Question: Calculate the shared savings or loss that Broad Medical receives or pays for each contract year. Show your work. State your assumptions.

SOA Commentary on Question:

Candidate performance was mixed, but most achieved some form of partial credit. The most common errors related to the manner in which the quality adjustment was applied (either in determining losses or in determining whether performance met the minimum thresholds).

SOA Answer:

For each year, the following steps should be performed:

1. Subtract expenditures from the benchmark to determine savings and losses
   a. For the renewal contract, the benchmark would need to be calculated as 10% x 96,000,000 + 30% x 96,000,000 + 60% x 96,000,000 = 96,000,000
2. Compare savings and losses against the minimum thresholds (2% x benchmark).
3. If the savings and losses do not meet the minimum thresholds, assign $0 for shared savings or shared loss.
4. If the savings and losses meet the minimum thresholds, multiply those amounts by the year's applicable upside risk and downside risk factors and then multiply by the quality score (note that any losses would not be adjusted by the quality score).

Year	Shared Savings	Shared Losses
2016	1,800,000	N/A
2017	1,800,000	N/A
2018	1,800,000	N/A
2019	960,000	0
2020	960,000	0
2021	0	-1,000,000
Total		

Part b:

Source(s): GH301-101-25 – ACO Payment Models
Question: Calculate the cumulative marginal revenue for 2016 – 2021 if the additional services are provided during: (i) 2016, (ii) 2017, (iii) 2018. Show your work. State your assumptions.

SOA Commentary on Question:

Candidate performance was mixed, but most achieved some form of partial credit. The most common errors related to only calculating changes in shared savings and not calculating the cumulative marginal revenue. When cumulative marginal revenue calculations were attempted, some candidates failed to incorporate the additional $1M in spending for each scenario.

SOA Answer:

For each year, the following steps should be performed:

1. Subtract expenditures from the benchmark to determine savings and losses
   a. For the renewal contract, the benchmarks would be calculated as:
      i. 2016 scenario: 10% x 97,000,000 + 30% x 96,000,000 + 60% x 96,000,000 = 96,100,000
      ii. 2017 scenario: 10% x 96,000,000 + 30% x 97,000,000 + 60% x 96,000,000 = 96,300,000
      iii. 2018 scenario: 10% x 96,000,000 + 30% x 96,000,000 + 60% x 97,000,000 = 96,600,000
2. Compare savings and losses against the minimum thresholds (2% x benchmark).
3. If the savings and losses do not meet the minimum thresholds, assign $0 for shared savings or shared loss.
4. If the savings and losses meet the minimum thresholds, multiply those amounts by the year's applicable upside risk and downside risk factors and then multiply by the quality score (note that any losses would not be adjusted by the quality score).
5. Sum the total revenue (expenditures + savings or losses) across all contract years and subtract the expenditures, savings, and losses determined in part a).

(i)

Year	Cumulative Marginal Revenue
2016	550,000
2017	0
2018	0
2019	48,000
2020	48,000
2021	1,000,000
Total	**1,646,000**

(ii)

Year	Cumulative Marginal Revenue
2016	0
2017	550,000
2018	0
2019	144,000
2020	144,000
2021	1,000,000
Total	**1,838,000**

(iii)

Year	Cumulative Marginal Revenue
2016	0
2017	0
2018	550,000
2019	288,000
2020	288,000
2021	1,000,000
Total	**2,126,000**

Part c:

Source(s): GH301-101-25 – ACO Payment Models, Duncan 22 (Risk) – Risk Adj: ACO's
Question: Describe two strategies for improving ACO incentives and the advantages and disadvantages of each strategy.

SOA Commentary on Question:

Candidates generally performed well. Full credit was given for well-reasoned strategies that included at least one advantage and one disadvantage.

SOA Answer:

One strategy would be modifying the benchmark weights to be equal across all years. An advantage of this strategy is reducing the incentives to increase spending in the last year before contract renewal. A disadvantage of this strategy is that it still does not address the perverse incentives that exist when first entering a contract.

Another strategy would be using 'yardstick competition' to base benchmarks on the performance of other providers. An advantage of this strategy is that it creates a stronger incentive for an ACO to achieve and maintain greater efficiency. A disadvantage is that less efficient providers may be less likely to participate due to expectations of a lower benchmark.

14. Fall 2022 DP #7

Part a:

Source(s): GH301-102-25 – Physician Profiling

Question: Describe how health plans use episode-based profiling to improve quality of care and cost efficiency.

SOA Commentary on Question:

Many candidates often described how episode-based profiling is done rather than focusing on how it improves quality of care and cost efficiency.

SOA Answer:

The data collected is shared with members so that members are steered towards higher quality / lower cost providers,

Some plans further incent members to use higher quality / more efficient providers through network tier placement (lower out-of-pocket costs for members using these providers).

Providers receiving a fixed episode-based payment are incented to be more efficient since use of unnecessary services hurt their own finances.

Meeting minimum quality standards is often required in order for providers to receive a bonus.

Part b:

Source(s): GH301-102-25 – Physician Profiling

Question: Describe considerations when implementing an episode-based profiling program for physicians.

SOA Commentary on Question:

There are many considerations that earned points. Full credit was given for four or more reasonable considerations.

SOA Answer:

One should consider how attribution to providers will work,

One should consider how to define the episode, such as trigger start end dates and follow-up services that will be included,

One should consider how to risk adjust the episode, as some providers treat unhealthier patients than average,

One should consider how the geographic costs (aka usual and customary costs) should be adjusted for,

One should consider how quality would be brought into the payments, as doctors might sacrifice quality in order to achieve cost efficiency.

Part c:

Source(s): Provider Payment Arrangements

Question: Calculate the total expected bonus payment to these physicians. Show your work.

SOA Commentary on Question:

Candidates generally did well on this part. Several candidates lost a little credit for not showing in intermediary values or for calculating an incorrect benchmark.

SOA Answer:

Calculate benchmark to be $687.30

Physician	Per Episode Cost	Number of Episodes	Diff From BM	Bonus Payment Per Episode	Total Bonus Payment
A	$500	40	$187.30	$9.37	$374.60
B	$600	30	$87.30	$4.37	$130.95
C	$800	50	($112.70)	$0.00	$0.00
D	$700	100	($12.70)	$0.00	$0.00
E	$550	100	$137.30	$6.87	$686.51
F	$700	60	($12.70)	$0.00	$0.00
G	$800	70	($112.70)	$0.00	$0.00
H	$600	80	$87.30	$4.37	$349.21
I	$800	60	($112.70)	$0.00	$0.00
J	$900	40	($212.70)	$0.00	$0.00
				Total	$1,541.27

Part d:

Source(s): Provider Payment Arrangements

Question: Recommend changes to the bonus program that would further incentivize cost efficiencies. Justify your response.

SOA Commentary on Question:

Many candidates only made one recommendation, but there are many things that could be done to improve upon this example's simplistic method. Full credit was given for four reasonable improvements.

SOA Answer:

Illustrative solution earning full credit:

They can increase the bonus % as the value right now is not meaningful to a typical provider,

They can implement a penalty for inefficient providers as right now these are not encouraged to change behavior (they are paid well right now),

They can decrease the benchmark to a value below the market average,

They could implement a [geographic adjustment / risk adjustment] to make more fair comparisons.

15. Fall 2022 DP #11

Part a:

Source(s): Provider Payment Arrangements, GH301-105-25 – Mgmt. of Provider Net.
Question: List methods used by health plans to control physician medical costs.

SOA Commentary on Question:

Candidates generally did well on this part. This question was fairly opened ended with many acceptable answers.

SOA Answer:

The following is a sample list of answers that received credit. This list is not comprehensive as there are dozens of possibilities. Credit was awarded to other answers not shown below if they helped to control physician medical costs.

- Limiting the number of physicians who receive in-network contracts
- Offering patients differential copayments to encourage them to visit high-performance physicians
- Paying bonuses to physicians whose pattern of resource use are lower than average (P4P arrangements also acceptable)
- Publicly reporting the relative costs of physicians' services
- Enlisting various contracting methods (fee-for-service, bundled payments, shared savings arrangements, capitation, etc)
- Limiting what services are reimbursable and requiring medical necessity for services performed
- Tying reimbursement to quality outcomes and using value based care arrangements over traditional fee-for-service.
- Creating a tiered physician network that focuses members toward highly efficient providers
- Requiring prior authorization for services and performing utilization management techniques

Part b:

Source(s): GH301-100-25 – Bundled Payment
Question: List and describe the key considerations in bundled payment contracting.

SOA Commentary on Question:

Candidates did well on this part. Full credit was awarded to candidates who were able to both list and describe at least half of the items below. Candidates who simply listed the items below were not awarded full credit. Some candidates only listed and described items that defined an episode. They did not receive full credit for their response.

SOA Answer:

Candidates needed to describe the items below in order to receive full credit.

1. Defining the episode - The "bundled" episode must be clearly defined because it defines contractual obligations. What is the "trigger" or "index date" and when does the case end? Which services are included?

2. Evaluating catastrophic risk - The bundled payment generally reflects the average per-patient cost for a set of services. An outlier risk analysis that includes a classical stop loss analysis can evaluate the financial risk to the sponsoring organization
3. Financial stability for low case loads - Financial risk that is due to random fluctuations may be greater for provider groups with low case loads.
4. Determining provider allocation of funds - The bundled rate negotiated between providers and payors is typically lower than the total the payor would have spent piecemeal. Physicians' financial incentives can help promote more cost-efficient care
5. The more severe the case, the higher the costs and reimbursement, but also the higher the outlier risk. One strategy to limit the risk is to contractually remove higher-severity patients.
6. Quality outcome requirements - Minimum quality outcomes and patient satisfaction thresholds may be incorporated into the bundled payment contract with specified rewards/penalties for meeting/not meeting quality outcome standards.
7. Administrative complexity - All parties will compare the benefits of the contract to the administrative costs of supporting the contract.
8. Risk-sharing alternatives - Risk-sharing contracts may be more viable than "pure" bundled payments. For example, the provider and payor could set a price target and agree to a risk-sharing arrangement where the provider is at risk for only a specified portion of the loss or gain of each patient.
9. Potential for increased utilization - Individual providers' contracts and the details of a funds flow model may create incentives to increase utilization with a bundle. Also, bundled payments may create an incentive for providers to produce more bundles

Part c:

Source(s): GH301-100-25 – Bundled Payment

Question: Calculate Quantum's combined unit cost trend for Hospitals A, B, and C. Show your work.

SOA Commentary on Question:

On this part of the question, most candidates were able to calculate Quantum's trend between Year 5 and Year 6. Some common mistakes made by candidates were calculating Quantum's total spend based on billed charges instead of allowed charges, not accounting for the number of admits for each of the procedures, and only calculating the unit cost trend by hospital instead of in total for Quantum. Strong candidates made comments that all the trend was unit cost trend because utilization was assumed to remain constant between Year 5 and Year 6.

SOA Answer:

Step 1: Calculate the Year 5 cost per admit (or cost per visit for colonoscopies) for each of the procedures by hospital.

Year 5 Cost per admit = Avg Allowed per Day * Avg Length of Stay

Year 5 Allowed per Admit

	Hospital A	Hospital B	Hospital C
Knee Replacement	$17,097	$19,600	$18,416
Hip Replacement	$14,260	$14,700	$14,520
Cesarean Section	$7,680	$7,750	$6,800
Colonoscopy	$1,200	$900	$1,100
Appendectomy	$6,150	$8,360	$9,180
Cardiac Stent	$12,250	$11,310	$11,840

Step 2: Calculate the Year 6 cost per admit (or cost per visit for colonoscopies) for each of the procedures by hospital.

Year 6 Cost per admit = Year 5 Cost per Admit * (1 + Allowed per Day Trend)

Year 6 Allowed per Admit

	Hospital A	Hospital B	Hospital C
Knee Replacement	$17,438	$19,992	$19,153
Hip Replacement	$14,973	$15,435	$15,972
Cesarean Section	$8,218	$8,293	$7,480
Colonoscopy	$1,236	$927	$1,166
Appendectomy	$6,396	$8,694	$9,914
Cardiac Stent	$12,373	$11,423	$12,077

Step 3: Calculate the total allowed amounts for Year 5 and Year 6.

Total Allowed Amount by procedure = Allowed per Admit * Number of Admits
Total Allowed Across all procedures = Sum of Allowed for all six procedures

Year 5 Total Allowed Amt

	Hospital A	Hospital B	Hospital C
Knee Replacement	$222,255	$313,600	$423,568
Hip Replacement	$213,900	$294,000	$145,200
Cesarean Section	$384,000	$271,250	$272,000
Colonoscopy	$96,000	$81,000	$110,000
Appendectomy	$295,200	$518,320	$459,000
Cardiac Stent	$245,000	$180,960	$213,120
Total Allowed	$1,456,355	$1,659,130	$1,622,888
		Sum of Hospital A, B, and C:	**$4,738,373**

Year 6 Total Allowed Amt

	Hospital A	Hospital B	Hospital C
Knee Replacement	$226,700	$319,872	$440,511
Hip Replacement	$224,595	$308,700	$159,720
Cesarean Section	$410,880	$290,238	$299,200
Colonoscopy	$98,880	$83,430	$116,600
Appendectomy	$307,008	$539,053	$495,720
Cardiac Stent	$247,450	$182,770	$217,382
Total Allowed	$1,515,513	$1,724,062	$1,729,133
		Sum of Hospital A, B, and C:	**$4,968,708**

Step 4: Calculate overall cost per admit for Year 5 and Year 6 for Quantum.

Cost per Admit = Sum of Hospital A, B, and C / Total Admits

Number of Admits (Visits)

	Hospital A	Hospital B	Hospital C
Knee Replacement	13	16	23
Hip Replacement	15	20	10
Cesarean Section	50	35	40
Colonoscopy	80	90	100
Appendectomy	48	62	50
Cardiac Stent	20	16	18
		Sum of Hospital A, B, and C:	**706**

	Formula	Result
Year 5	$4,738,373 / 706	$ 6,712
Year 6	$4,968,708 / 706	$ 7,038

Step 5: Calculate overall unit cost trend for Quantum.

Unit Cost Trend = (Year 6 Unit Cost / Year 5 Unit Cost) – 1

Unit Cost Trend = ($7,038 / $6,712) – 1 = 4.86%

Part d:

Source(s): GH301-105-25 – Mgmt. of Provider Net.
Question: Calculate the impact of the change on Quantum's unit cost trend. Show your work.

SOA Commentary on Question:

Candidates struggled on this part of the question with many candidates leaving their answer blank. Some mistakes were more common than others. Some candidates applied the case rates across all three of the hospitals instead of only to Hospital A. Other candidates attempted to use CS-Quantum Exhibit 9 of the case study to break the bundle between facility, medical supplies, and professional.

SOA Answer:

The solution for Part (d) is similar to Part (c), however candidates needed to recognize that the allowed per admit for Year 6 is different for Hospital A due to the bundled payments.

Step 1: Calculate the Year 5 cost per admit (or cost per visit for colonoscopies) for each of the procedures by hospital.

Year 5 Cost per admit = Avg Allowed per Day * Avg Length of Stay

Year 5 Allowed per Admit

	Hospital A	Hospital B	Hospital C
Knee Replacement	$17,097	$19,600	$18,416
Hip Replacement	$14,260	$14,700	$14,520
Cesarean Section	$7,680	$7,750	$6,800
Colonoscopy	$1,200	$900	$1,100
Appendectomy	$6,150	$8,360	$9,180
Cardiac Stent	$12,250	$11,310	$11,840

Step 2: Calculate the Year 6 cost per admit (or cost per visit for colonoscopies) for each of the procedures by hospital.

Year 6 Cost per admit = Year 5 Cost per Admit * (1 + Allowed per Day Trend)

Year 6 Allowed per Admit

	Hospital A	Hospital B	Hospital C
Knee Replacement	*$38,200*	$19,992	$19,153
Hip Replacement	*$31,000*	$15,435	$15,972
Cesarean Section	*$15,000*	$8,293	$7,480
Colonoscopy	*$2,100*	$927	$1,166
Appendectomy	*$11,000*	$8,694	$9,914
Cardiac Stent	*$23,000*	$11,423	$12,077

Step 3: Calculate the total allowed amounts for Year 5 and Year 6.

Total Allowed Amount by procedure = Allowed per Admit * Number of Admits
Total Allowed Across all procedures = Sum of Allowed for all six procedures

Year 5 Total Allowed Amt

	Hospital A	Hospital B	Hospital C
Knee Replacement	$222,255	$313,600	$423,568
Hip Replacement	$213,900	$294,000	$145,200
Cesarean Section	$384,000	$271,250	$272,000
Colonoscopy	$96,000	$81,000	$110,000
Appendectomy	$295,200	$518,320	$459,000
Cardiac Stent	$245,000	$180,960	$213,120
Total Allowed	$1,456,355	$1,659,130	$1,622,888
		Sum of Hospital A, B, and C:	**$4,738,373**

Year 6 Total Allowed Amt

	Hospital A	Hospital B	Hospital C
Knee Replacement	*$496,600*	$319,872	$440,511
Hip Replacement	*$465,000*	$308,700	$159,720
Cesarean Section	*$750,000*	$290,238	$299,200
Colonoscopy	*$168,000*	$83,430	$116,600
Appendectomy	*$528,000*	$539,053	$495,720
Cardiac Stent	*$460,000*	$182,770	$217,382
Total Allowed	*$2,867,600*	$1,724,062	$1,729,133
		Sum of Hospital A, B, and C:	**$6,320,795**

Step 4: Calculate overall cost per admit for Year 5 and Year 6 for Quantum.

Cost per Admit = Sum of Hospital A, B, and C / Total Admits

Number of Admits (Visits)

	Hospital A	Hospital B	Hospital C
Knee Replacement	13	16	23
Hip Replacement	15	20	10
Cesarean Section	50	35	40
Colonoscopy	80	90	100
Appendectomy	48	62	50
Cardiac Stent	20	16	18
		Sum of Hospital A, B, and C:	**706**

	Formula	Result
Year 5	$4,738,373 / 706	$ 6,712
Year 6	*$6,320,795* / 706	*$ 8,953*

Step 5: Calculate overall unit cost trend for Quantum.

Unit Cost Trend = (Year 6 Unit Cost / Year 5 Unit Cost) – 1

Unit Cost Trend = ($8,953 / $6,712) – 1 = 33.40%

Moving Hospital A to bundled payments caused Quantum's unit cost trend to increase from 4.86% to 33.40% - an increase of 28.5%.

Part e:

Source(s): GH301-100-25 – Bundled Payment
Question: Assess the implications and options for Quantum to mitigate the effects of this change.

SOA Commentary on Question:

More than half the candidates left this part of the question blank. Strong candidates were able to take their result from Part (D), explain the impact to Quantum's trend, and provide multiple options to mitigate the effects of the change. Responses to this question from the viewpoint of Hospital B were not awarded full credit.

SOA Answer:

Implication to Quantum – In Part (D), the implication of Hospital A moving to a bundled payment arrangement was an increase in Hospital A's unit cost trend from 4.1% to 96.9% which increased Quantum's overall unit cost trend to 33.4%. Since Hospital A and Hospital B had similar overall costs in Year 5, moving Hospital B to the proposed bundled payment arrangement will further increase Quantum's overall unit cost trend.

The following items can be proposed to help mitigate the effects of moving Hospital B to a bundled payment arrangement (note: this is not a comprehensive list)

- Move Hospital B to bundled payments, but lower the bundle amounts to be more in line with Year 5 costs
- Refuse Hospital B's offer and keep them on their current reimbursement methodology
- Only move procedures with a wide fluctuation in unit costs to the bundled payment methodology to help reduce Quantum's risk
- Remove Hospital B from the network altogether
- Consider the adoption of other risk-sharing alternatives such as value-based care models

16. Spring 2022 SPC #3

Part a:

Source(s): Duncan 14 (Risk) – Risk Adj. - Medicare

Question: (i) Discuss considerations actuaries should account for in projecting risk scores for Medicare Advantage bids, other than those prescribed by the Center for Medicare and Medicaid Services (CMS). (ii) Explain the consequences of projecting risk scores that are too high or too low.

SOA Commentary on Question:

Most candidates received partial or full credit on part (i). For part (ii), the ultimate revenue from CMS is based on actual risk scores. Some candidates incorrectly stated that the revenue received from CMS is based on projected risk scores.

SOA Answer:

Model Solution for (i)

- The expected trend in risk scores. This could be due to internal programs to ensure complete and correct diagnosis coding. Even with no programs, risk scores are likely to change. Historically risk scores have tended to drift upwards.
- The projection of the risk score must be appropriate for the *expected* population that will be enrolled in the contract year, not the base year or the middle year between the base year and the contract year.

Must specify that the projection is for is two years from the base year.

- The projection must be at the bid level.
- The actuary must estimate what the average risk scores of new entrants will be, unless it is a closed block or a stationary population.
- Population change must be estimated
- A mortality factor should be considered because it can be a significant factor for a Medicare population and claims of deceased patients are heavily skewed
- Most MAOs perform longitudinal analysis on their membership stratified into "stayers," "leavers," and "joiners"

Model Solution for (ii)

- A risk score overstatement may result in an excessively generous benefit plan, causing the MAO to lose money.
- A risk score understatement may lead to an uncompetitive product or portfolio of products.

Part b:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's

Question: (i) State the two models of accountable care organization (ACO) gainsharing as part of the Medicare Shared Savings Program (MSSP). (ii) Describe requirements an ACO must pass in order to be allowed to share savings with CMS. (iii) Explain how the provider group-based ACO is expected to generate savings through the MSSP.

SOA Commentary on Question:

Almost all candidates identified the two models of ACO gainsharing. Most candidates performed well on the other two parts of the question.

SOA Answer:

Model Solution to (i) The two models of ACO gainsharing:

1. **One-sided: the ACO and CMS share 50/50 in any gains.**
2. **Two-sided: the ACO shares more of the gains, but is at risk for any losses.**

Model Solution for (ii) The two requirements for sharing savings with CMS:

1. Meet quality standards
   a. Must be able to report on quality in first year.
   b. Not required to meet or exceed standards in first year.
   c. Must meet standards thereafter.
   d. 31 individual measures in 2017 reporting year, used to be 33
2. The ACO must surpass a savings hurdle rate
   a. Hurdle ranges between 2% for large ACOs (60,000 or more members.) and 4% for small ACOs (500 members).
   b. The ACO must have 5,000 members for three years.

Model Solution to (iii): Savings generated by

Care Coordination: to manage the care of patients who need additional services

- Reduce the need for tests by 1) integrated medical records and 2) consistent management by the providers
- Include efficient providers for referrals
- Limit the use of less efficient and more expensive providers.
- Focus on quality will also result in fewer unnecessary services
- Emphasize preventive services to improve future population health

Part c:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's

Question: An ACO has three members, all of whom are of the same Medicare enrollment type. The following information is for one of the benchmark years.

Claims Type	ACO Participant	Member 1	Member 2	Member 3
Inpatient hospital	Yes	$58,000	-	-
Hospital bad debt charge	Yes	$100	-	-
Skilled nursing facility	Yes	$5,000	-	-
Physician A	Yes	$700	$200	-
Physician B	No	-	$800	-
Hospice	Yes	-	-	6,000
Durable medical equipment	Yes	$1,300	-	-
Prescription drugs	-	$500	-	-
Months Enrolled in ACO		12	12	6

(i) Describe the separate Medicare enrollment types.

(ii) Calculate the ACO's average per capita expenditure for the benchmark year. Show your work.

SOA Commentary on Question:

For part (i), the question asks for the enrollment types for ACO members. Some candidates listed the enrollment types for Medicare Advantage plans.

For part (ii), although the question states that the ACO has three members, some candidates excluded member 2 in the calculation because that member did not have a plurality of their services with an ACO provider. However, members are attributed based on the plurality of their primary care services. The claims type stated in the question are from two physicians, not necessarily limited to primary care. Once members are attributed, all medical claims are included.

SOA Answer:

Model Solution for (i): The different enrollment types

- ESRD—eligibility for Medicare as a result of end stage renal disease.
- Disabled—eligibility for Medicare due to disability.
- Aged/dual-eligible Medicare and Medicaid beneficiaries—eligible for Medicare by age, and eligible for Medicaid.
- Aged/non-dual-eligible beneficiaries—eligible for Medicare by age, but not eligible for Medicaid

Model Solution for (ii):

Formula to Calculate Average Per Capita Expenses:

$$\text{Average per capita expenditure}_{i,j} = \frac{\sum_k \text{claims}_{i,j,k} \times t_k}{\sum_k t_k} \text{ where:}$$

i = Medicare enrollment type
j = Year
k = individual beneficiary ($(k = 1, \ldots, n)$ where n is the number of ACO beneficiaries of type i in year j.)
t_k = exposure period of the k^{th} beneficiary of type i in year j.

Eligible Expenses:

Member 1: \$65,000=\$58,000+\$5,000+\$700+\$1,300
Total claims:
Excluding bad debt
Excluding prescription drugs

Member 2: \$1,000=\$200+\$800
Total claims including Physician B (non-participating physician)

Member 3: \$6,000 Total claims

Claims weighted for member exposure

Member 1: Member exposure: 12/12 = 1
Member 1: Claims weighted for member exposure 1 * \$65,000 = \$65,000

Member 2: Member exposure: 12/12 = 1
Member 2: Claims weighted for eligible member exposure 1 * $1,000 = $1,000

Member 3: Member exposure: 6/12 = 0.5
Member 3: Claims weighted for member exposure 0.5 * $6,000 = $3,000

Total ACO Claims weighted for member exposure:

$65,000+$1,000+$3,000 = **$69,000**

Average per Capita Eligible Expenditures for the ACO: Total eligible expenses divided by total membership exposure:
$69,000/2.5 = **$27,600**

17. Spring 2023 RM #2

Part a:

Source(s): GH301-105-25 – Mgmt. of Provider Net.
Question: (i) List elements necessary for network management. (ii) Describe an example of how these elements could be at odds with each other.

SOA 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.

SOA Answer:

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.

Part b:

Source(s): GH301-105-25 – Mgmt. of Provider Net.
Question: Describe necessary steps for ABC to develop a set of measures for provider network quality.

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

SOA Answer:

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.

Part c:

Source(s): GH301-105-25 – Mgmt. of Provider Net.
Question: (i) Calculate the efficiency of Hospital X using the Portfolio Method. Show your work. (ii) Assess potential concerns with the efficiency assessment. (iii) 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.

SOA 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.

SOA Answer:

(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.

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.

18. Spring 2023 RM #4

Part a:

Source(s): The Cost of Value-Based Care

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

SOA 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.

SOA Answer:

- 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

Part b:

Source(s): Value-Based Care Framework

Question: Describe four capabilities of the Value-Based Care Framework.

SOA 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.

SOA Answer:

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.

Part c:

Source(s): GH301-101-25 – ACO Payment Models
Question: 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.

SOA 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.

SOA Answer:

Step 1: Calculate benchmark without two hip replacements included.

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

Savings = 50% * (1,300,000 – 1,200,000) = 50,000

Three-year savings = 50,000 * 3 = 150,000

Step 3: Calculate benchmark with two hip replacements included.

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

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

Savings = 50% * (1,318,000 – 1,200,000) = 59,000

Three-year savings = 59,000 * 3 = 177,000

Step 5: Calculate total incremental revenue generated by OPQ

Total incremental revenue = Step 4 – Step 2 = 177,000 – 150,000 = **$27,000**

Part d:

Source(s): GH301-101-25 – ACO Payment Models

Question: Propose three changes to LMN's ACO arrangement with OPQ that will prevent unintended incentives. Justify your response.

SOA Commentary on Question:

Most candidates performed well on this part of the question.

SOA Answer:

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.

Part e:

Source(s): Value-Based Care Framework

Question: 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

SOA 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.

SOA Answer:

(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.

19. Fall 2023 RM #4

Part a:

Source(s): Provider Payment Arrangements
Question: Describe various provider payment models.

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

SOA Answer:

1. Bundled payment – one payment per procedure / admission – typically including all services associated with that procedure
2. Fee for Service – contracted fixed amount for each specific service / fee schedule
3. Shared Savings – provider shares in gain / loss based on provider's performance and quality against a benchmark
4. Global Capitation – pay one rate per member (regardless of utilization)
5. Pay for Performance – payment based on quality of hospital / provider
6. Diagnosis Related Group (DRG) – similar to bundled payment, pays per admission to hospital that is reflective of underlying diagnosis
7. Per Diem – pays for each day of an admission
8. Reference Pricing – set a maximum reimbursement rate that will be paid regardless of the provider

Part b:

Source(s): Provider Payment Arrangements
Question: You have been asked to address concerns regarding the cost volatility of certain procedures in the insurer's network of three hospitals. Your first focus is cardiac stent procedures.

You are given the following information for cardiac stent procedures:

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
Annual Admits	450	200	325	150	500
Average Length of Stay (Days)	3.5	2.4	4.1	2.7	4.0
Paid Cost per Day	$3,200	$3,600	$3,800	$4,100	$2,900
Member Coinsurance at Hospital	20%	20%	20%	20%	20%

(i) Calculate a bundled payment for cardiac stent procedures. Show your work.
(ii) Recommend which hospital(s), if any, should be re-contracted for this procedure. Justify your response.

SOA Commentary on Question:

Some candidates viewed the term re-contracting to mean not just changing an existing contract but also to renew or adjust an existing contract with the other hospitals. Credit was given to well thought out responses that proposed re-contracting the other hospitals.

SOA Answer:

(i)

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
Allowed Cost per Day	$4,000	$4,500	$4,750	$5,125	$3,625
Total Cost per Procedure	$14,000	$10,800	$19,475	$13,838	$14,500
Bundled Payment (Weighted Avg)	$14,840				

(ii) Hospital C should be re-contracted at the bundled rate because this would result in a lower cost to the insurer.

Part c:

Source(s): GH301-104-25 – Tiering in Healthcare

Question: Your leadership has proposed a bundled payment to all five hospitals. The CEO of Hospital C has threatened to terminate their contract with the insurer over this proposal. You have been asked to evaluate the following actions to resolve the issue with Hospital C.

Action	Description
Implement Tiered Payment System	Tier Member Coinsurance at Hospital C
Implement Shared Savings Arrangement	Set a benchmark for cardiac stent procedures, and share 50% of the surplus or deficit with Hospital C
Terminate Hospital C	Hospital C becomes out-of-network where member coinsurance is increased. Allowed costs for Hospital C will increase 10%

Describe advantages and disadvantages of each action for addressing the issue.

SOA Answer:

Tiered Payment System – steer members to more efficient providers through lower member cost sharing

Pros:

- Provider continues to be in-network
- Members are steered to high-quality, lower cost hospitals through lower member cost share

Cons:

- Provider may not like being evaluated on quality or may not be receptive to being classified in a non-preferred tier.

Shared Savings Arrangement – Provider gets a bundled rate and shares in savings and deficit

Pros:

- Retain the savings.
- Encourages the provider to be efficient

Cons:

- Provider may not be willing to take on risk
- Appropriate benchmark tricky to calculate
- Administratively complex to administer

Termination – no longer list Hosp C as In-Network

Pros:

- lessen admin burden of negotiation.
- Steer patient from expensive provider.
- Lower costs

Cons:

- may lose network adequacy in certain specialties, losing efficient provider, member abrasion.
- May leave members with no choice.
- Also, may be good in other treatments.

Part d:

Source(s): Provider Payment Arrangements

Question: Calculate the member coinsurance or benchmark required for each action in part (c) to generate the same savings as the bundled payment proposal. Show your work.

SOA Answer:

	per admit cost to start	$15,580
	per admit cost with bundling	$11,872
	Savings for Bundling per admit	$3,708
Tiering	Plan Portion	61%
	Total Cost at C	$19,475
	New Per Admit Cost	$11,872
Shared Savings	Benchmark	$12,059
Termination	Plan portion	55%
	Cost increase	10%
	New Cost	$21,423
	New Per Admit Cost	$11,872

20. Fall 2023 RM #8

Part a:

Source(s): GH301-103-25 – Cost Profiling-Reliability
Question: Explain the process for constructing physician cost-profiles.

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

SOA Answer:

- Group services into meaningful clinical categories (episode) related to patient condition
- Determine episode cost, using cut points to eliminate extreme values.
- Assign each episode to the physician who had the highest proportion of total professional costs and who had billed at least 30% of professional costs.
- Construct of physician summary cost profiles

Part b:

Source(s): GH301-103-25 – Cost Profiling-Reliability
Question: You are given the following:

Physician #1 Episode A	**Units**	**Cost/Unit**
Office Visits	3	$100
Hemoglobin	2	$25
Daily Drugs	365	$1
Lipid Profile	1	$40
Physician #1 Episode B	**Units**	**Cost/Unit**
Office Visits	4	$90
Hemoglobin	2	$25
Daily Drugs	365	$1
Lipid Profile	2	$35

Calculate the summary cost-profiles score for each physician. Show your work.

SOA Commentary on Question:
Many candidates only calculated the Total Cost for Physician #1 and #2. Those who performed best completed the exercise by taking the average of the two and calculating the relativity of each physician to the average. Another common error was calculating relativities by service category instead of for the total episode.

SOA Answer:

Total Cost for Physician #1 = Sumproduct = $755
Total Cost for Physician #2 = Sumproduct = $845
Average = $800
Physician #1 Score = $755/$800 = 0.944
Physician #2 Score = $845/$800 = 1.056

Part c:

Source(s): GH301-102-25 – Physician Profiling
Question: Describe differences between traditional physician profiling and episode-based profiling.

SOA Commentary on Question:

Most candidates demonstrated a high-level understanding of traditional and episode-based profiling. Candidates who performed best demonstrated a deeper understanding of the source material, providing some of the responses below. Other responses consistent with the source material were also accepted.

SOA Answer:

- Episodic programs raise the importance of complete, accurate data collection and submission. Physicians who electronically submit accurate, fully-documented claims to payers are more likely to have reliable episode profiles and will more likely receive credit for patient-level comorbidities and other risk-adjustment facotrs.
- Episodic programs differentiate physicians with better-organized and supported practice infrastructure.
- Episode-based profiling is likely to catalyze the medical profession, particularly through specialty certifying boards, to accelerate the development of administrable, evidence-based performance measures.
- All stakeholders in the system need to engage in a collaborative process to improve the robustness, utility, and impact of episode-based profiling.

Part d:

Source(s): GH301-102-25 – Physician Profiling
Question: Describe physician implications of episode-based profiling.

SOA Commentary on Question:

Most candidates demonstrated a high-level understanding of how episode-based profiling has an impact on physician practices. However, many candidates did not provide the depth explored in the study note.

SOA Answer:

- Payers for health services are likely to continue to drive greater performance transparency in health-care delivery.
- Proliferation of performance metrics that directly address well-documented variations in the quality and economic performance of the care delivery system.
- Practices are likely to improve and become more standardized over time, and they have significant implications for practice, policy and research.

21. Spring 2024 RM #4

Part a:

Source(s): Provider Payment Arrangements

Question: Describe the following reimbursement arrangements from a provider risk perspective. (i) Shared Savings (ii) Global Capitation

SOA Commentary on Question:

In part (a), the question asks about reimbursement and many candidates described only the shared savings portion and omitted the method of reimbursement. In the second part it was important to remember that the point of view is from the provider perspective, not the insurance company/payer.

SOA Answer:

(i) In a Shared Savings model, the provider reimbursement is based on a FFS agreement with a provision for additional payment if a benchmark is achieved. There may be a quality requirement as well.

(ii) The provider takes over the full risk of the population in return for a PMPM (per member per month) capitation payment. The PMPM may or may not be adjusted for population characteristics.

Part b:

Source(s): Provider Payment Arrangements

Question: Describe Shared Savings and Global Capitation from a provider perspective for the following risks by completing the table below:

	Shared Savings	**Global Capitation**
Utilization		
Technical		
Insurance		
Performance		

	Shared Savings	Global Capitation
Utilization	This varies depending on the nature of the contract.	Increased utilization and the associated costs are the responsibility of the provider.
Technical	There will be reconciliation with the benchmark measure and then any savings will need to be equitably dispersed among providers.	The umbrella provider organization needs to determine the proportion of the capitation rate that should go to the constituent providers.
Insurance	Since the savings benchmark relies on loss ratio, there is a risk that the revenue is not correctly set. In shared savings model the risk is not loss but not achieving savings. In a two sided model the risk is that costs exceed benchmark.	The provider is at risk for all costs which may exceed the revenue from capitation,.
Performance	Achieving the benchmark will require efficient care. If the agreement has a quality component there will be performance risk.	Efficient and high quality care are needed to manage performance risk in a capitated arrangement

Part c:

Source(s): Provider Payment Arrangements

Question: Calculate the Shared Savings to Alpha for calendar year 2023. Show your work.

SOA Commentary on Question:

Commentary and solution in associated Excel files

Part d:

Source(s): Provider Payment Arrangements

Question: Beta has approached Alpha in early 2024 regarding a Global Capitation arrangement beginning immediately for 86.5% of revenue. You received the following message from Alpha's CEO.

> *"The board wants to accept this offer but has requested my input. They are excited that we "get to keep it all", but I am not so sure about this given the recent changes to the government risk adjustment model beginning this year and the payer industry's high claims trend. I need the loss ratio projection to be below 86% to agree to this."*

(i) Outline the risks of accepting this proposal. (ii) Describe actions that can be taken to mitigate them.

SOA Commentary on Question:

This question asks the candidate to identify risks, and then for the risks identified, suggest a mitigation plan of action. Credit was given for identifying the risks, but credit was only given if the mitigations could be tied with the identified risks.

SOA Answer:

In this arrangement Alpha assumes the risk for all costs of care for the population in return for the potential of larger share of the savings, but the capitation rate is at a lower loss ratio.
Revenue risks – The revenue would need to be sufficient to cover the expected risk of Alpha's population. This requires adequate coding of diagnoses, as well as reliance that the revenue was calculated correctly by Beta. Any changes in the risk adjustment model may adversely impact the projected revenue.
Expense Risk – higher costs and utilization will be Alpha's responsibility.

Revenue risk – increase coding accuracy to minimize missing diagnoses. Include a stipulation in the contract to revisit revenue amounts if the population or the risk adjusted methods change significantly or the realized revenue is significantly lower than expected.
Claims risk – Alpha might purchase reinsurance. Carve out conditions or members. Use best practices in care management. Involve practitioners in cost management programs.

22. Spring 2024 RM #7

SOA Commentary on Question:

This question was testing a candidate's understanding of different aspects of provider contracting, including types of providers, regulations, and tiering. Candidates generally did well on parts (a) and (b), earning either full or partial points for describing types of providers and regulations. Candidates struggled on part (c) where they needed to identify and utilize the TNHP savings formula.

Part a:

Source(s): GH301-104-25 – Tiering in Healthcare

Question: Describe the following categories of providers in a PPO. (i) Preferred Providers (ii) Non-Preferred Providers (iii) Out of Network Providers

SOA Commentary on Question:

Most candidates performed well on this part of the question.

SOA Answer:

(i) Preferred Providers are in-network providers of high value, with a mix of higher quality care and lower negotiated contract rates for services. Health plans will steer members to these providers through lower cost share.

(ii) Non-Preferred Providers are in-network providers which are still contracted with the health plan, but do not meet the same value or quality standards for Preferred Providers. Cost sharing for members will be higher to utilize these providers compared to the preferred tier.

(iii) Out of Network Providers do not have a direct contract with the health plan and are often lower value, either due to low quality of care, high service rates, or both. The quality of care could be on par with the preferred providers, but the cost of care may be much higher and/or the ability to offer discounts may not be possible.

Part b:

Source(s): GH301-104-25 – Tiering in Healthcare

Question: Describe regulatory guidance to ensure that quality is not diminished when a restrictive network is put into place.

SOA Commentary on Question:

Most candidates provided a correct response that described standards for provider composition, access, and consumer protection. Candidates who received full points also included regulatory guidance related to NAIC Model Regulation as described in the source material.

SOA Answer:

NAIC Model Regulation Section 5B requires that health insurers must file an Access Plan with state insurance commissioner. State insurance department personnel typically perform a "Network Adequacy Analysis," which includes the review of the access plan. Standards which are reviewed in this analysis include:

- Provider Composition standards - adequate number and mix of provider types and specialists

- Access standards - reasonable and adequate access to all providers and facilities in a carrier's service area by specialty or type.
- Consumer Protection standards - balance bill and hold harmless the member not allowed

Part c:

Source(s): GH301-104-25 – Tiering in Healthcare

Question: (i) Calculate the savings for each of the four service categories. Show your work (ii) Recommend whether the TNHP design should include tiering for each service category. Justify your response.

SOA Commentary on Question:

Successful candidates applied the TNHP savings formula from the source material to calculate a savings percentage for each service category. Recommendations for part (ii) needed to align with the savings results calculated from part (i). Most candidates using the formula received partial credit for calculating several of the variables, but few candidates correctly calculated each variable to get to the correct solution. Several candidates did not use the formula and instead incorrectly performed a total dollar cost comparison between the 2023 data and the new 2025 plan design.

SOA Answer:

(i) The model solution for this part is in the Excel spreadsheet.

(ii) I recommend tiering for diagnostic lab tests, diagnostic imaging, diagnostic imaging high tech, and OP surgery as these all show generated savings under the TNHP design.

23. Fall 2024 RM #3

Part a:

Source(s): GH301-101-25 – ACO Payment Models
Question: Calculate the cumulative marginal revenue over the two MSSP contract period (2021 through 2026) under the following scenarios. Show your work. (i) The surgery occurs in 2022 (ii) The surgery occurs in 2023

SOA Commentary on Question:

Candidates did well on this question. Most candidates applied the appropriate weights, depending on the year of the surgery. Some candidates missed the fact that the surgery is considered revenue to the HMO and applied it as a cost.

Candidates with an alternative solution citing recent updates to the ACO gainsharing calculation described in Chapter 22 of Duncan (Risk) (equal weights for second period benchmarking, 40% loss sharing) also received credit.

SOA Answer:

The model solution for this part is in the Excel spreadsheet.

Part b:

Source(s): GH301-101-25 – ACO Payment Models
Question: Propose weights to use in determining the benchmark such that the cumulative marginal revenue does not exceed net payments for the surgery.

SOA Commentary on Question:

Many candidates understood that by using equal weights, the cumulative marginal revenue would equal the FFS payments. Equal weights is not the only solution, as the question asked that cumulative marginal revenue not exceed the surgery cost. Candidates who illustrated that proposed weights might not be possible due to a minimum shared savings rate also received credit.

SOA Answer:

The model solution for this part is in the Excel spreadsheet.

Part c:

Source(s): GH301-101-25 – ACO Payment Models
Question: Recommend other changes to the MSSP structure to ensure the ACO and Centers for Medicare and Medicaid Services (CMS) both realize savings. Justify your response.

SOA Commentary on Question:

Candidates generally did well on this part of the question. Candidates who did not receive full credit either only justified one change or listed changes without justification.

SOA Answer:

Extend the benchmarking period to five years with equal weights.

- This will penalize cost savings less heavily, adding an incentive for the ACO to reduce costs while limiting the ability for short-term gaming of the MSSP sharing formula

Blend an ACOs benchmark with local benchmarks (yard stick approach) such as the traditional FFS Medicare spending in the ACO's market.

- Recognizes local characteristics and best practices – ensuring both CMS and the ACO consider the relative costs of care in the applicable area and base compensation accordingly
- Promotes competition on value, efficiency, and savings.

24. Fall 2024 RM #7

Part a:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's

Question: Describe how a provider group-based accountable care organization (ACO) can generate savings.

SOA Commentary on Question:

Most candidates performed well on this part of the question.

SOA Answer:

1. **Care Coordination:** The practice will implement "care coordination" to manage the care of the patients who need additional services.
2. **Data-Driven Management and Decision Making:** Access to integrated medical records and consistent management by the physician will reduce the need for tests.
3. **Efficient Contracting and Cost Management:** The ACO will develop a network of efficient providers for referrals and will limit the use of less efficient and more expensive providers.
4. **Focus on Quality:** The focus on quality will also result in fewer unnecessary services, and by emphasizing preventive services, lead to later savings as population health is improved.

Part b:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's

Question: (i) Explain whether each beneficiary meets the assignment criteria established by the Medicare Shared Savings Program. Justify your response. (ii) Identify the entity to which the beneficiary is assigned, assuming each beneficiary meets the necessary criteria. Justify your response.

SOA Commentary on Question:

Most candidates performed well on this part of the question. However, in part (i), some candidates were unaware that Puerto Rico and Guam are U.S. territories, although it is covered in the study materials. In part (ii), some candidates failed to point out Beneficiary C would not be assigned to an ACO.

SOA Answer:

(i)

- Beneficiary A does not meet the beneficiary assignment criteria
  - does not have at least one month of Part A and Part B enrollment
- Beneficiary B does not meet the beneficiary assignment criteria
  - enrolls in Medicare group (private) health plan
  - does not live in the United States or U. S. territories and possessions
- Beneficiary C does not meet the beneficiary assignment criteria
  - does not have at least one month of Part A and Part B enrollment (only 6 months in Part A)
- Beneficiary D meets the beneficiary assignment criteria
  - lives in the United States or U. S. territories and possessions
  - has a record of Medicare enrollment
  - has at least one month of Part A and Part B enrollment

(ii)

- Beneficiary A – Entity 1
  - Beneficiary A receives the plurality of primary care at $375 from Entity 1: an ACO Entity.
- Beneficiary B – Entity 1
  - Beneficiary B receives the primary care at $800 only from Entity 1: an ACO Entity.
- Beneficiary C – Not assigned
  - Beneficiary C has the highest charges from **Entity 3 (Non-ACO Entity)** at $400, which is not tied to the ACO. Since MSSP assigns beneficiaries to an ACO only if the majority of their primary care services are provided by ACO-linked entities, Beneficiary C would not be assigned to an ACO.
- Beneficiary D – Entity 2
  - Beneficiary D receives the plurality of primary care at $400 from Entity 2: a Federally Qualified Health Center (FQHC) where the physician NPI is included on the ACO Participant List.

Part c:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's
Question: (i) Calculate the historical benchmark per capita. Show your work. (ii) Calculate the updated benchmark per capita. Show your work.

SOA Commentary on Question:

Most candidates demonstrated basic knowledge of the benchmark calculations; however, few successfully followed through to arrive at the correct final answer. In part (c)(ii), partial to full credit was awarded if the calculation was based on an incorrect input from part (c)(i) but was otherwise performed correctly.

SOA Answer:

The model solution for this part is in the Excel spreadsheet.

Part d:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's
Question: (i) Explain how XYZ meets the requirements to share savings with Centers for Medicare & Medicaid Services (CMS). Justify your response. (ii) Calculate the shared savings to XYZ. Show your work.

SOA Commentary on Question:

In part (i), most candidates were able to list the requirements; however, some did not provide explanations on how XYZ specifically met those requirements. In part (ii), partial to full credit was awarded if the calculation was based on an incorrect input from part (c) but was otherwise performed correctly.

SOA Answer:

(i) **Meet Quality Performance Standards**: ACOs must achieve specified quality benchmarks across four main domains:
  - ***Patient/Caregiver Experience***
  - ***Care Coordination/Patient Safety***

- ***Preventive Health***
- ***At-Risk Population Management***
  - The ACO meet the quality standards.
    - ACO XYZ was assigned a positive health equity adjusted quality performance score of 55 (%).
    - Because XYZ is in its first year, they do not need to compare their performance score to a target.

Achieve Savings Beyond the Minimum Savings Rate (MSR): There is a MSR savings hurdle rate that the ACO must surpass in order to be eligible for shared savings.

- The ACO meet the MSR requirement.
  - The savings ($32.7M) are greater than the MSR ($16.4M). (details in Excel spreadsheet)

(ii) The model solution for this part is in the Excel spreadsheet.

Part e:

Source(s): Provider Payment Arrangements

Question: Contrast an ACO shared savings reimbursement model and a fee-for-service (FFS) model for the following risks: (i) Technical (ii) Insurance

SOA Commentary on Question:

Most candidates performed well on this part of the question. Additional responses outside of those covered here but relevant to the question were also acceptable.

SOA Answer:

(i) Technical

ACO Shared Savings – High

- The providers are typically still paid on an FFS basis. However, shared savings model requires the calculation of the benchmark, reconciliation of the savings, measurement of the agreed-upon quality measures, auditing the agreed-upon attribution method, and distributing savings or losses among providers.

- ACOs take on the technical risk associated with investments in data infrastructure, electronic health records (EHRs), and population health management tools. These technologies are essential for tracking patient outcomes, coordinating care, and reporting to CMS. If these systems fail or underperform, ACOs risk missing quality benchmarks and losing out on shared savings.

FFS – Low

- The FFS model is easier to implement, design and monitor and thus less dependent on advanced technology for care coordination because providers are reimbursed per service without the same incentive to track patient outcomes. There is less technical risk for providers regarding care management systems and data interoperability.
- The main technical risk in FFS is centered on accurate billing and coding systems to ensure providers receive payments. There is less emphasis on integrated care technology, though billing errors can still result in lost revenue or compliance issues.

Also, nonspecific codes or codes for new technologies and new drugs can bring in more technical risk as they can be more difficult for claims departments to monitor. Updating the price list each year can also be complex.

(ii) Insurance

ACO Shared Savings – Medium/High

- ACOs bear insurance risk through cost management, as ACOs must manage the unpredictability of patient health needs while controlling costs.
- Since ACOs are accountable for a defined population, they assume insurance risk related to unexpected shifts in patient health status. If a patient population has higher-than-expected medical costs, the ACO might fail to achieve savings or even incur losses in a two-sided risk arrangement.

FFS – Low

- In FFS, providers do not bear insurance risk directly because they are paid per service rendered, regardless of patient outcomes or overall costs. The insurance risk is largely borne by the payer rather than the provider.
- However, there is still some risk associated with patient volume variability, which can impact provider income.

Group and Health Course 301
Curated Past Exam Solutions
Learning Objective #2: Disease Management
Applicable SOA Questions: Fall 2020 to Fall 2024
Model Solutions

Contents

1. Fall 2020 SPC #1

SOA Commentary on Question:

Most candidates performed well on Part (a) while fewer candidates performed as well on Parts (b) and (c).

Part a:

Source(s): Duncan 22 (Risk) – Risk Adj: ACO's; Duncan 3 (DM) – CM and Interventions
Question: Describe features of a successful ACO care management program.

SOA Answer:

Data and analytics are not very mature and incomplete for ACO's. ACO needs to employ high-quality, real-time, data analytics.

The ACO model emphasizes the Electronic Medical Record. Most are often in notes rather than readable form, limiting nurse productivity.
Importance of Economics: An ACO needs to focus on patients with greatest opportunity for cost reduction. Intervention objectives and metrics need to be defined.

Importance of planning and understanding opportunities: Opportunity analysis would be a useful tool for ACOs to take corrective actions.

Part b:

Source(s): Duncan 3 (DM) – CM and Interventions
Question: (i) Describe key elements of case management. (ii) List challenges case managers face in performing their work.

SOA Answer:

(i) Key elements of case management:
Involves health care professional that coordinates care of patient with serious disease or illness.
Case manager is usually a nursing professional.
Case loads are small because of intensity of services.
Complexity of diseases that necessitate a case manager usually involve multiple medical specialties/institutions, etc.

(ii) Challenges case managers face in performing their work:
To perform activities consistently and uniformly

Not empowered to control access to resources, but only suggest alternatives.
New untested treatments are difficult for MCOs to deny.
Progression of patient leads to various outcomes making it hard to follow guidelines.
Medical resources available to patients vary by community complicating the work of case managers.

Part c:

Source(s): Duncan 3 (DM) – CM and Interventions

Question: Drug adherence can be measured in two ways.(i) Write the formula for each measure. (ii) Compare and contrast the two measures. (iii) Explain ways to increase drug adherence.

SOA Commentary on Question:

Many candidates had difficulty in accurately describing the numerator and/or denominator of both formulas.

SOA Answer:

(i) Formulas

Medication Possession Ratio (MPR) = No. of Days' supply in the patient's possession/No. of Days during the measurement period during which the patient could have had the drug

Proportion of Days Covered (PDC) = No. Days of Coverage/Total No. of Days in the Measurement Period

(ii) The two measures differ in that –

MPR counts all days of supply, even when they overlap, therefore could be greater than 100%

PDC starts with days and asks: did the patient have a drug on this day?

PDC is more conservative measure than MPR because it avoids the double-counting when more than one drug is consumed in one day.

The two measures are similar in that –

Neither measure can confirm the drug was consumed

(iii) Ways to increase drug adherence includes –

Establish adherence/possession ratio of 80%; up to 95% for HIV drugs.

Introduce programs

To raise patient awareness

To predict which patients are likely to be non-adherent, and then

To intervene with them

Face-to-face counseling by trained pharmacists at time of initial Rx.

Track first fill rates with and without pharmacist intervention.

Reduce patient cost or offer incentives

More successful when pharmacists actively intervene with the physician to change dose or prescription.

2. Fall 2020 SPC #2

SOA Commentary on Question:

Candidates were tested on their ability to describe how care management programs are evaluated and to evaluate a particular sample program.

Part a:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's

Question: Explain how *return* is understood by business decision makers in the return on investment (ROI) paradigm versus for employee health management (EHM).

SOA Commentary on Question:

Candidates generally earned some credit for this section, but had to mention how the EHM savings were derived to earn full credit.

SOA Answer:

In the ROI paradigm, the revenue generated by a program is compared against the amount of the investment to determine the return of the program.

In the EHM paradigm, the return is expressed as savings based on money not spent due to prevented events like hospitalizations or ER visits.

Part b:

Source(s): Duncan 12 (DM) – Act. Control Method

Question: Describe recommended financial metrics to measure healthcare cost savings from EHM.

SOA Commentary on Question:

Some candidates did well, responding on the different ways healthcare cost savings could be derived. Various methods were needed to earn full credit. Candidates who only listed, rather than described, how the different metrics of measurement could be expressed (e.g. ROI, net savings) did not receive credit.

SOA Answer:

The first category of metrics are directly monetized metrics. This can be evaluated with a variety of methods such as:

- comparing company's cost trend against peer organizations without EHM,
- comparing actual to expected cost trends,
- comparing chronic and non-chronic trends between a baseline and measurement period, and
- comparing participants in the EHM program to non-participants.

A second category of metrics are monetized rates of hospitalizations that were prevented by EHM. This can be determined by reviewing downward trends on ER visits or hospitalizations.

A third category of metrics are based on a model that links to what occurred during a program and the characteristics of the participants. This may include rigorous studies of prior years of the program applied to the book of business or be related to changes in lifestyle-related health risk factors.

Part c:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's
Question: Calculate the reduction in hospitalizations per 1,000 members required to achieve a desired hurdle rate of 100%. Show your work.

SOA Commentary on Question:

Many of the candidates performed well on this part of the question.

SOA Answer:

Total cost of program = Members * Cost PMPM * 12
Total cost of program = 1,000 * $1.75 * 12 = $21,000

Hurdle rate of 100% = Net ROI of 100% = Gross ROI of 200%

Total Savings Needed = 200 % * $21,000 = $42,000

Reduction in Hospitalizations Needed = Total Savings Needed / Cost Per Hospitalization = $42,000 / $12,000 = **3.5 fewer hospitalizations**

Part d:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's
Question: (i) Explain reasons for and against continuing the EHM program. Show your work. (ii) Recommend whether or not to continue the EHM program. Justify your response.

SOA Commentary on Question:

Most candidates performed well on Part (i). Candidates able to identify various reasons for continuing the program and recommending to continue the program in part (ii) received full credit. Partial credit was given for recommending to discontinue the program as long as justification was provided.

SOA Answer:

(i) Expected hospitalizations in measurement period = Baseline period hospitalizations * trend = 50 * 1.02 = 51

Reduced hospitalizations in measurement period = Expected hospitalizations in measurement period – Actual hospitalizations in measurement period = 51 – 3 = 48

Cost Savings = Reduced hospitalizations * Cost per hospitalization = 3 * $12,000 = $36,000
Cost of program = $21,000
Gross ROI = $36,000 / $21,000 = 171%

Reasons against continuing the program:

- The hurdle rate of 100% was not met.

Reasons for continuing the program:

- The program still achieved a positive ROI.
- More members have an LDL of less than 100. This indicates that the program is improving the health of the population.
- Most EHM programs produce more savings in subsequent years, so it's possible the savings will increase in year 2.
- There could be savings from other areas, like reduced ER visits.

(ii) It is recommended to continue the program. While the hurdle rate was not met, the ROI was still positive. The leading indicator of reduced LDLs means that members will achieve greater savings, and the program could be reasonably expected to produce more savings in future years. Savings could also potentially be found in other service categories besides inpatient hospitalizations. All of these indicators lead to reasons to continue the program.

3. Spring 2021 SPC #1

SOA Commentary on Question:

Most candidates realized that Valuation of Care Management Vendors, Health Watch, May 2020, was the source reading material for this question. Some candidates referenced Chapter 3, Care Management Programs and Interventions, Duncan in answering Part A.

Many candidates were able to list and describe the 6 methods in answering Part C.

Part a:

Source(s): Valuation of CM Vendors

Question: You have been asked to describe key attributes in valuing care management vendors. Describe how care management vendors can impact medical costs.

SOA Answer:

Utilization management

- The vendor manages a specific set of medical procedures, often delineated by listed procedure codes
- Management may impact utilization based on medical necessity, appropriateness of the procedure for a specific diagnosis, medically redundant combinations of procedures or other scenarios
- Changes in average utilization are measured in units per thousand members, but in the case of inpatient admissions, can also be measured in average length of stay; in the latter case, bundling claims, where a decrease in length of stay may not provide any dollars savings, should also be considered

Site of care

- A vendor may shift specified types of care to less expensive venues
- For example, if a certain procedure could be performed just as well at home or in the physician's office as in a hospital setting, management of that procedure could shift utilization from the most expensive place (the hospital) to one of the less expensive places

Diagnosis or patient type

- Some vendor arrangements identify and manage patients receiving a certain type of care as determined by diagnosis, such as end-stage renal disease, pain management, medical/behavioral health comorbidity and so on
- Savings are often measured based on all covered care provided to persons under management rather than for a limited set of specific procedures or diagnoses
- The goal of these services is often to reduce unnecessary inpatient admissions or emergency department visits

Severity/downcoding

- Some types of medical treatment are coded by severity levels, with higher payment made for greater severity

- A vendor might identify and verse inappropriate upcoding or "code creep," leading to a utilization shift from severe/expensive procedures to those that are less so

Descriptions of the following from Duncan Chapter 3 - Care Management Programs and Interventions were also acceptable responses

- pre-authorization
- concurrent review
- case management
- demand management
- disease management
- specialty case management
- population health management
- patient center medical home
- accountable care organizations (ACOs)
- non-traditional provider intervention and care settings
- gaps in care and quality improvement programs
- telehealth, telemedicine, and automated monitoring systems
- bundled payment initiatives

Part b:

Source(s): Valuation of CM Vendors

Question: Describe how to measure the effect of a medical savings initiative.

SOA Answer:

- Take one group of people affected by the initiative and another group of people not affected by the initiative
- Measure the difference in total claim expenditures
- All else being equal, the difference between the two groups is your savings
- Methods used often depend on what data are available
- Measure the difference in the effect being targeted, that is, reduced admissions and the savings is the number of admissions avoided

Part c:

Source(s): Valuation of CM Vendors

Question: Describe the methods of various complexity to measure medical savings.

SOA Answer:

Pre-/Post-analysis

- A comparison of experience under the vendor arrangement (experience period) to a period of time before implementation (base period). In its most direct form, simple averages are calculated for each period, with an adjustment for trend between the periods.

- The primary shortcoming of this method of analysis is that adjustments for trend and other differences between the base period and the experience period introduce cumulative uncertainty over time, resulting in decreased confidence in measurements with each passing time period

Participating/Nonparticipating analysis

- Some initiatives do not affect all plausibly defined members. For example, some enrollment or opt-in process may be required, which not all members or groups will pursue. Other initiatives may be limited by region or some other category that does not affect members' risk or cost expectation
- In this case one can define the control and test populations according to who is and who is not affected by the initiative
- Again, in its most direct form, simple averages are used, and since both populations are measured in the same time period, trend is not an issue

Regression/trend line analysis

- A more complex form of pre-/post-analysis in which a control population can be used to generate a formula, as with a regression formula
- Projected values are then compared to actual values and the difference between the two represents the savings

Matched cohort analysis

- A more complex form of participating/nonparticipating analysis in which a number of variables that are expected to affect claims totals is generated and then used to match members of the test population to risk-equivalent members of the control population
- The difference in costs between each matched pair represents the savings

Propensity score matching

- A more advanced method of matching test and control members that estimates the predicted probability that each member receives a treatment based on observed characteristics
- Bias from confounding variables is reduced and dropped observations are minimized
- However, a large sample size is required, and the selection of variables can affect the outcome

Coarsened exact matching

- In this matching method, defining variables are coarsened into ranges or bins; this allows a greater degree of exact matches between test and control populations
- The selection of variables is once again critical to the outcome of the exercise

4. Spring 2021 SPC #4a-b

Part a:

Source(s): Duncan 11 (DM) – Propensity Scoring
Question: Describe advantages and disadvantages of propensity score matching

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

SOA Answer:

Pro 1: Allows matching on composite score instead of directly on individual characteristics
Pro 2: Allows individuals to be grouped, because members with similar propensity scores will have similar values of the characteristics
Con 1: Sometimes close matching is difficult, so the number of matched treatment members becomes small relative to the total treatment group
Con 2: Only controls for observable, and not unobservable variables
Con 3: Score should not be used as the standalone criterion (matched individuals should still be "close" on other variables)
Con 4: There will always exist a trade-off between number of matches and "closeness" of the score

Part b:

Source(s): Duncan 11 (DM) – Propensity Scoring
Question: Compare and contrast propensity score and risk adjustment

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

SOA Answer:

1. Risk adjustment and propensity score both calculate a composite score based on several characteristics.
2. Propensity score is usually based on a wider range of independent variables than risk score.
3. Risk score will almost always take into account more detailed diagnosis variables than the propensity score.
4. Risk adjustment uses the entire population, while propensity score matching can result in many members of the population being discarded when there is incomplete overlap between populations.
5. Risk adjustment is a well-known technique among actuaries and increasingly among insurers and government officials, while propensity score is less well-known.

5. Fall 2021 SPC #3

Part a:

Source(s): Duncan 12 (DM) – Act. Control Method
Question: Define exposure in a disease management (DM) environment.

SOA Commentary on Question:

Candidates received credit for including either of the definitions listed below. Candidates did not receive credit for listing items that related to exposure without attempting to define the term.

SOA Answer:

Exposure in a Disease Management environment can mean two things:

1) Whether the individual is "exposed to" or a member of a group selected for intervention or a program.
2) For measurement calculations, it relates to the denominator in actuarial calculations. It refers to the entire group eligible for an intervention or included in a study. A member is considered an exposure regardless of whether they are actively engaged in the program.

Part b:

Source(s): Duncan 12 (DM) – Act. Control Method
Question: Verify the accuracy of the following statements. Justify your answer.(i) The actuarially-adjusted historical control methodology is a cohort study (ii) Excluding newly-identified members in an actuarially-adjusted historical control methodology is recommended

SOA Commentary on Question:

On part i) candidates often understood that the actuarially-adjusted historical control methodology is comparing two sets of populations that are not identical. Candidates often mistook this for an "open cohort" but then described that this group was not the same population. Partial credit was awarded in this case.

On part ii) many candidates did not recognize that removing new members from an actuarially-adjusted historical control methodology is recommended.

SOA Answer:

(i) False – The actuarially-adjusted historical control methodology is not a cohort study because the methodology does not follow a population identified in the baseline period through to the end of the intervention period, but rather two populations in two periods, identified according to the same criteria.

(ii) True – It is recommended to exclude newly-identified members to avoid regression to the mean in the newly-identified chronic population.

Part c:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's

Question: You are provided with the following information from a DM vendor for a health plan:

- Assumed utilization trend for the period is 5%
- Cost for the DM program is $3 per member per month
- Vendor asserts that the DM program achieves a pre-tax hurdle rate of 150%

	Baseline Period	Measurement Period
Average Total Member Population	100,000	125,000
Chronic Member Months	300,000	375,000
Chronic Population Inpatient Admissions	20,000	25,000
Average Cost Per Member Per Year	$8,350	$8,350

Critique the vendor's assertion. Show your work.

SOA Commentary on Question:

Many candidates performed well on this part of the question. Candidates that calculated the correct ROI received full credit for the calculation portion of this question. While $8,350 was intended to be the cost per admission, credit was awarded for other assumed or calculated values. Some candidates did not take a stance on the vendor's assertion and did not understand the difference between gross ROI and a hurdle rate.

SOA Answer:

Baseline Admissions/1000 x Utilization Trend = 20,000 / ((300,000 / 1,000) / 12) = 800 * 1.05 = 840

Actual Admissions/1000 = 25,000 / ((375,000 / 1,000) / 12) = 800

Difference of Trended Baseline Admissions/1000 and Actual Admissions/1000 Equals Reduced Admissions/1000 = 840 – 800 = 40

Actual Member Years/1000 in Intervention Period = 375,000 / 12,000 = 31.25

Product of Reduced Admissions/1000 and Actual Member Years/1000 in Intervention Period Equals Total Reduced Admissions = 40 * 31.25 = 1,250

Multiplied by Trended Unit Cost per Admission Equals Total Savings due to Averted Admissions = 1,250 * $8,350 = $10,437,500

Total Cost = 125,000 * $3 * 12 = $4,500,000

Gross ROI = $10,437,500 / $4,500,000 = 2.3

The vendor's assertion is not correct. A hurlde rate of 150% implies a gross ROI of 2.5. The Gross ROI of 2.3 does not exceed the value of 2.5.

6. Fall 2021 SPC #6

Part a:

Source(s): Valuation of CM Vendors

Question: Describe methods used by care management vendors to impact medical costs.

SOA Commentary on Question:

Most candidates performed well on this part of the question. Candidates needed to describe methods, rather than just list them, to receive full credit.

SOA Answer:

1. Utilization management. The vendor manages a specific set of medical procedures, often delineated by listed procedure codes. Management may impact utilization based on medical necessity, appropriateness of the procedure for a specific diagnosis, medically redundant combinations of procedures or other scenarios.
2. Site of care. A vendor may shift specified types of care to less expensive venues.
3. Diagnosis or patient type. Some vendor arrangements identify and manage patients receiving a certain type of care as determined by diagnosis, such as end-stage-renal disease, pain management, medical/behavioral health comorbidity and so on.
4. Severity/downcoding. Some types of medical treatment are coded by severity levels, with higher payment made for greater severity. A vendor might identify and reverse inappropriate upcoding or "code creep," leading to a utilization shift from severe/expensive procedures to those that are less so.

Part b:

Source(s): Valuation of CM Vendors

Question: Describe considerations for the evaluation of the vendor's cost savings approach.

SOA Commentary on Question:

Most candidates recognized that something regarding the cohort and trend were considerations. Candidates needed to include additional considerations to receive full credit. Candidates also needed to describe considerations, rather than just list them, to receive full credit.

SOA Answer:

1. Include a comparable cohort and evaluate the change in the nonparticipating group with the change in the participating group. This comparison can be further enhanced by ensuring the two groups have equivalent levels of risk. *Note: An alternate answer was that the relative risk between the pre and post population needs to be evaluated for comparability.*
2. Include a means for trend. Determine a utilization trend using historic baseline data or other means and ensure it is adequately part of the contract.
3. Credibility adjustment. If there will not be enough members enrolled in the program, ensure that the result will be credible enough to derive value. If there are not enough members in the program, exclude a value calculation.
4. Timing. Either count for a full year or apply a seasonality adjustment if the evaluation will be less than a full year.
5. Defined time to allow for claims runout. Set a cutoff date for all claims to be processed in order to be included in the comparison.

6. Overlap with other initiatives. If there are members in other initiatives, consider excluding from evaluation.

Part c:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's

Question: Calculate: (i) Gross return on investment (ROI) for the program. Show your work. (ii) Savings per enrolled member per month. Show your work.

SOA Commentary on Question:

Most candidates performed well on this part of the question and were able to correctly calculate the gross ROI and savings per enrolled member per month to receive full credit.

SOA Answer:

Step	Description	Calculation	Result
A	ER Utilization Savings	4,000 * (1.02) – 3,700	380 visits
B	Total Program Savings	$750 * A	$285,000
C	Total Program Costs	$100 * 2,000 + $75,000	$275,000
D	Gross ROI	B / C	1.04
E	Gross Savings PMPM	B / (2,000 * 12)	$11.88
F	Net Savings PMPM	(B – C) / (2,000 * 12)	$0.42

7. Spring 2022 SPC #1

Part a:

Source(s): Duncan 11 (DM) – Propensity Scoring
Question: Calculate the propensity score for each member. Show your work.

SOA Commentary on Question:

Most candidates performed well on this part of the question.

SOA Answer:

$p = \exp[\alpha + \beta_{age}*X_{age} + \beta_{gender}*X_{gender} + \beta_{plan}*X_{plan}] / \{1 + \exp[a + \beta_{age}*X_{age} + \beta_{gender}*X_{gender} + \beta_{plan}*X_{plan}]\}$

Member 1:
p = exp [2 -0.06 *25 + 0.3*0 -0.2*1] / {1 + exp [2 -0.06 *25 + 0.3*0 -0.2*1]}
p = exp [0.3] / {1 + exp [0.3]}
p = 1.3499 / {1 + 1.3499}
p = 0.5744

Member 2:
p = exp [2 -0.06 *35 + 0.3*1 -0.2*0] / {1 + exp [2 -0.06 *35 + 0.3*1 -0.2*0]}
p = exp [0.2] / {1 + exp [0.2]}
p = 1.2214 / {1 + 1.2214}
p = 0.5498

Part b:

Source(s): Duncan 11 (DM) – Propensity Scoring
Question: Interpret each member's propensity score.

SOA Commentary on Question:

Most candidates received partial or full credit on this part of the question. Candidates who specified that the propensity score applies to a member of the same age, gender, and who has a similar benefit plan as stated in the problem received full credit.

SOA Answer:

A 25 year-old male in an HMO benefit plan has a 57.44% probability of being in the treatment group.
A 35 year-old female in a PPO benefit plan has a 54.98% (55%) probability of being in the treatment group.

Part c:

Source(s): Duncan 11 (DM) – Propensity Scoring
Question: Describe the limitations of applying the propensity score matching results from the DSME/T program to other populations.

SOA Commentary on Question:

Most candidates were able to identify that PSM does not control for unobservable characteristics. Some candidates mentioned that the analysis was limited to commercial payers/members. Fewer candidates identified additional limitations.

SOA Answer:

Analysis limited to commercial payers/members, that is, it does not include Medicare and Medicaid populations.

Medicare and Medicaid have a lot of diabetic members, and they benefit from DSME/T services

By including these diabetic members, reduction in DSME/T services cost-sharing could result in higher compliance of recommended services, and lower hospitalizations.

Possible that non-users of DSME/T service used these services in prior years

PSM doesn't control for unobservable characteristics

Small sample size, i.e. low credibility

8. Spring 2022 SPC #4

SOA Commentary on Question:

This question tests the candidate's knowledge of a care management approach known as opportunity analysis. The candidate needed a thorough understanding of the process and economics of the approach to provide a full response to the question.

Part a:

Source(s): Duncan 9 (DM) – Opportunity Analysis
Question: Describe opportunity analysis.

SOA Commentary on Question:

Most candidates received partial or full credit on this part of the question. Candidates who were able to provide a more thorough description received full credit.

SOA Answer:

- Opportunity analysis is a data driven analytical process that matches opportunities identified in a population to care management programs and services
- The purpose of opportunity analysis is to demonstrate the potential clinical, financial, and humanistic improvements that could result from the application of an appropriate, evidence-based care management program or programs.
- Opportunity analysis focuses the attention of program sponsors on the idea that high-utilizing patients in a population represent an opportunity for simultaneously improving the quality of care while reducing net utilization.
- The requirements of an Opportunity Analysis include:
    - 2 or 3 years of eligibility and claims data
    - Knowledge of member benefit design
    - Information on evidence-based care management programs that currently exist or could reasonably be introduced
- Opportunity analysis is retrospective, but applied prospectively. This means that opportunities are identified using historical data, but applied to members in the current year that meet the same criteria
- The components of an Opportunity Analysis include:
    - Analytics – members are segmented by condition into subpopulations suitable to different types of interventions (episodic, chronic, mental and behavioral health, emerging). Utilization is compared to benchmark, and may require further drill downs into
    - Evidence – search the evidence base for knowledge of what works and what doesn't. Search for relevant publications that are efficacious, cost-effective, and generalizable

  Economics – members of the population are risk ranked to determine at which point in the risk ranking it is economically feasible to intervene

Part b:

Source(s): Duncan 9 (DM) – Opportunity Analysis

Question: Evaluate the accuracy of the following statements. Justify your response.

(i) Traditional condition groupings, such as Hierarchical Condition Categories (HCCs), are a common grouping algorithm for segmenting membership when applying opportunity analysis.

(ii) Although a randomized controlled trial provides very robust evidence of efficacy, it can be subject to some biases.

(iii) Opportunity analysis recognizes and addresses the economics of program planning in a system which is resource constrained.

(iv) Information on any and all care management programs currently in place should be included when performing an opportunity analysis.

(v) A single intervention to target members with a mental health condition is a successful application of the opportunity analysis approach.

(vi) Segmentation of a population by cost and frequency is a useful application of the opportunity analysis approach.

SOA Commentary on Question:

This part of the question required the candidate to evaluate the accuracy of a statement and provide justification. Candidates who knew the material well performed well on this part of the question. If a statement was true, candidates needed to provide justification beyond simply repeating the statement itself to receive full credit. Candidates who simply stated whether a statement was true or false without any justification received no credit.

SOA Answer:

(i) False – Opportunity analysis maintains the risk score stratification of prior care management models and favors common risk profiles, **but** the risk scores and condition groupings are NOT THE ONLY items considered in the Opportunity Care segmentation, which is why it is preferable. Opportunity analysis maintains the risk score stratification but favors those who are more intervenable and have a common risk profile.

(ii) True – biases could stem from non-observable characteristics, like willingness to recover or cede hope or behavior changes simply as a function of being observed.

(iii) True – opportunity analysis emphasizes the need to have a plan, and apply the resources to the most intervenable patients that can have the most beneficial effect.

(iv) False – Opportunity analysis focuses on evidence-based care management programs. One should search the evidence base, assess the quality of the evidence (some sources are more reputable, like peer reviewed journals), and determine the generalizability of the program. Good programs to consider are generalizable, cost-effective, and efficacious.

(v) False – mental health conditions can be hard to treat because they often have several comorbidities involved, which means managing a larger population and set of conditions than just mental health. Also, mental health data is much more protected and may be harder to obtain and analyze.

(vi) True-A further useful segmentation may be made by cost and frequency. Examples of such sub-analyses are:

1. Conditions that are high cost regardless of frequency
2. Conditions that moderate in cost but high frequency
3. Treatments whose frequency varies greatly between different geographical areas or between different providers compared with national utilization benchmarks, having adjusted for age, sex, and comorbidities.

Segmentation by cost and frequency may present sub-populations that represent an opportunity to improve quality while reducing utilization and costs, e.g. end of life members.

The end-of-life subset of the population may exhibit materially higher admission rates than the rest of the population which may provide good evidence that this sub-population represents an opportunity to improve quality of life and reduce net utilization with no impact on the length of life.

Part c:

Source(s): Duncan 9 (DM) – Opportunity Analysis
Question: List the steps for implementing a care management program using the opportunity analysis approach.

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

SOA Answer:

1. Populate the population risk distribution using predictive analytics
2. Develop a production analysis and reporting unit
3. Determine the number of care managers needed
4. Develop a budget for the program
5. Train the care managers on the intervention program and techniques
6. Develop a plan on the number of members that will be targeted
7. Roll out the care management program
8. Monitor the program , compile result and modify as needed

9. Fall 2022 SPC #1a

Part a:

Source(s): Duncan 3 (DM) – CM and Interventions

Question: Describe care management methods used to control health care utilization.

SOA Answer:

Some of the methods include:

Prior authorization, requiring approval before performing certain procedures to ensure medical necessity.

Concurrent review, examining how physicians provide services on site to evaluate their services. Many physicians are annoyed by this.

Disease management, identifying and targeting specific population, conditions to managed and achieved outcome improvement and savings. Usually chronic disease.

Case management, managing care for high-cost patients through care coordination to hopefully achieve better outcome and lower cost.

Demand management, passive intervention program such as nurse call lines to provide lower cost options for members seeking services.

Specialty management, specific experts in certain field of case management. Such as biosimilar drugs usage.

Population health management, examine the risk profile of the total population and introduce programs such as wellness program to achieve overall better health.

Gaps in care and quality improvement opportunity, identifies where services deviate from best practice and has room for improvement.

Telemedicine, telehealth, automated categorization system. Uses technology to provide services from remote area and tracks member status automatically to lower costs and increase service options.

Accountable Care Organizations, provider or hospital-based group to manage care of Medicare members with the desire to improve quality and lower per capita cost.

Federally Qualified Health Clinics, provide services for underserved or uninsured, sponsored by the government.

Non-tradition care managers, pharmacists and clinicians to help manage utilization.

Bundle payment initiatives, use of bundle payments to improve the reimbursement structure and more efficient utilization.

10. Fall 2022 SPC #3

Part a:

Source(s): Duncan 12 (DM) – Act. Control Method: Duncan 13 (DM) – Risk & Trend
Question: Explain features of the actuarially-adjusted historical control methodology for evaluating care management outcomes.

SOA Commentary on Question:

Candidates generally scored well on this part of the question. Additional responses from the source material that are not shown in the model solution were also accepted for credit.

SOA Answer:

- Objective criteria are used to assign members to index and intervention populations. The populations don't have to be the same in each period (open group method).
- An appropriate trend derived from an index group is applied to evaluate the intervention group.
- Baseline period costs for the intervention group are multiplied by the trend from the index group. This is compared to intervention period costs for the intervention group and the difference between the two is considered savings due to the program.
- Baseline period does not have to be adjacent to intervention period.
- It is important to consider the change in risk mix between baseline and intervention periods. For example, risk adjustment factors could be applied.

Part b:

Source(s): Duncan 13 (DM) – Risk & Trend
Question: (i) Calculate the per member per month (PMPM) gross savings and ROI for the first year of the program. Show your work. (ii) Recommend whether the program should be continued. Justify your response.

SOA Commentary on Question:

Most candidates failed to re-weight by the year 1 chronic enrollment mix, leading to an incorrect calculated ROI of 242%. Very few candidates received full credit for this section.

SOA Answer:

Calculate the before and after claims and membermonths of the baseline cohort by summing up all baseline member data.

Pre Total Spend	Pre MM	Post Total Spend	Post MM
$3,884,647	1,630	$4,433,881	1,671

Calculate the PMPM of the population.
Pre PMPM: $3,884,647 / 1,630 = $2,383
Post PMPM: $4,433,881 / 1,671 = $2,653

Calculate the trend factor: $2,653 / $2,383 = 11.34%

Calculate the before and after claims and membermonths of the cohorts with COPD and/or diabetes, assigning each member in the cohort they are in at the time, and allow for switching between periods.

Chronic Conditions	Pre Total Spend	Pre MM	Post Total Spend	Post MM
Diabetes	$1,107,662	429	$1,156,102	337
COPD	$1,773,055	559	$1,449,064	405
Diabetes & COPD	$2,380,265	673	$3,211,365	966

Calculate the before and after PMPMs for the three cohorts.

Chronic Conditions	Pre PMPM	Post PMPM
Diabetes	$2,582	$3,431
COPD	$3,172	$3,578
Diabetes & COPD	$3,537	$3,324

Calculate the PMPM in aggregate for the before period, re-weighted with year 1 enrollment.
Rewieghted Before PMPM = ($2,582 x 337 + $3,172 x 405 + $3,537 x 966) / (337 + 405 + 966) = $3,261.86

Calculate the PMPM in aggregate for the after period.
After PMPM = ($3,431 x 337 + $3,578 x 405 + $3,324 x 966) / (337 + 405 + 966) = $3,405.46

Calculate the savings.
Savings = $3,261.86 x (1.1134) - $3,405.46 = $226.23

Calculate an ROI for the program.
ROI = $226.23 / $50 = 4.52:1 ROI

The program should be continued, as it is generating positive savings. Furthermore, the ROI exceeds the 2:1 target. This is only the first year of the program, so peformance may improve in future years.

11. Spring 2023 RM #5

SOA Commentary on Question:

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

Part a:

Source(s): Duncan 16 (DM) – Testing Act. Methods

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

SOA Commentary on Question:

Candidates generally performed well on this part of the question.

SOA Answer:

- 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.

Part b:

Source(s): Duncan 16 (DM) – Testing Act. Methods

Question: 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.

SOA 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.

SOA Answer:

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: ($369.92 * 1.0271 * 1.0408) - $401.46 = -$6.01

(ii) Intervention Year 1 savings: ($370.79 * 1.0423) - $376.42 = $10.05
Intervention Year 2 savings: ($370.79 * 1.0423 * 1.0951) - $401.46 = $21.76

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) = ~$3,470,478
Intervention Year 2: (3,600 chronic members x $401.46 PMPM + 8,400 non-chronic members * $275.78 PMPM) = ~$3,761,805

(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: -$6.01 * 3,600 chronic members * 12 = ~ -$21,650

(ii) Intervention Year 1: $10.05 * 3,000 chronic members * 12 = ~$36,186
Intervention Year 2: $21.76 * 3,600 chronic members * 12 = ~$78,332

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

(i) Intervention Year 1: $54,103 / $3,470,478 = 1.6%
Intervention Year 2: -$21,650 / $3,761,805 = -0.6%

(ii) Intervention Year 1: $36,186 / $3,470,478 = 1.0%
Intervention Year 2: $78,332 / $3,761,805 = 2.1%

Part c:

Source(s): Duncan 16 (DM) – Testing Act. Methods
Question: (i) Critique the scenarios from part b. (ii) Recommend whether Company ABC should continue offering the DM program. Justify your response.

SOA 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.

SOA Answer:

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: $78,332 / $200,000 = 0.39

12. Spring 2023 RM #7

SOA Commentary on Question:

Most candidates performed well on parts (a) and (b) of the question.

Part a:

Source(s): Duncan 9 (DM) – Opportunity Analysis

Question: (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.

SOA Answer:

(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 introducted, and
- Eligibility and claims data for the prior 2 or 3 years

(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)

Part b:

Source(s): Duncan 11 (DM) – Propensity Scoring

Question: 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.

SOA Answer:

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

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

Part c:

Source(s): Duncan 11 (DM) – Propensity Scoring

Question: Calculate the propensity score for each treatment and control group member. Show your work.

SOA Commentary on Question:

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

SOA Answer:

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

Control Member 1
exp[2 – 0.01x30 + 0.1x0 – 0.001x600] / (1 + exp[2 – 0.01x30 + 0.1x0 – 0.001x600]) = .750

Control Member 2
exp[2 – 0.01x55 + 0.1x1 – 0.001x820] / (1 + exp[2 – 0.01x55 + 0.1x1 – 0.001x820]) = .675

Treatment Member 1
exp[2 – 0.01x40 + 0.1x1 – 0.001x780] / (1 + exp[2 – 0.01x40 + 0.1x1 – 0.001x780]) = .715

Treatment Member 2
exp[2 – 0.01x60 + 0.1x0 – 0.001x680] / (1 + exp[2 – 0.01x60 + 0.1x0 – 0.001x680]) = .673

Part d:

Source(s): Duncan 11 (DM) – Propensity Scoring

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

SOA Answer:

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 = abs(0.715 – 0.750) = 0.035
Distance between Treatment Member 1 and Control Member 2 = abs(0.715 – 0.675) = 0.040
Distance between Treatment Member 2 and Control Member 1 = abs(0.673 – 0.750) = 0.077
Distance between Treatment Member 2 and Control Member 2 = 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

13. Fall 2023 RM #1

SOA Commentary on Question:

This question tested general candidate knowledge on techniques for implementing and evaluating care management solutions.

Part a:

Source(s): Duncan 9 (DM) – Opportunity Analysis

Question: (i) Describe the Opportunity Analysis process. (ii) Explain the purpose and considerations for each of the following steps in the Opportunity Analysis process when designing a care management program:

- Analytics
- Evidence
- Economics

SOA Answer:

The Opportunity Analysis process extends traditional predictive modeling by matching opportunities within a client's populations to care management programs. It is retrospective (analyzing past data to identify patient population as high opportunity) but applied prospectively to current members based on the characteristics targeted in the intervention period. OA has a two-dimension nature:

- Members are segmented by severity, need, utilization, and intervenability
- Programs are organized by target, resource cost and effectiveness

Analytics

- The purpose of analytical profiling is to segment members in broad groups that consist of like conditions and are amenable to different types of intervention applied to their care management program
- An example of stratification maps diagnoses to condition categories, such as Episodic, Chronic, Mental Health, Emerging.
- Further useful segmentation may be made by cost and frequency

Evidence

- The purpose is to conduct a literature review to identify programs or interventions that function well (improve quality of care and reduce utilization and cost)
- Proposed programs should be efficacious (evidence demonstrates clinical effectiveness), cost-effective (expected benefits exceed the program cost), and generalizable (risk profile and characteristics of the study population is similar to our target population)
- Three-step process: search for relevant publications (casting a wide net using searching tools like Google Scholar or PubMed), assess the quality of evidence (peer-reviewed studies that use high evidence methods such as randomized controlled trials are usually better), and determine generalizability (recent studies from the same country are preferable).

Economics

- A key consideration is the ability to risk-rank a population using appropriate predictive modeling.
- The process should result in an expected cost per risk-ranked patient.

- This is then compared with the program cost per intervened patient to determines at which level to intervene using determined financial goals, such as ROI target or marginal savings objectives.

Part b:

Source(s): Duncan 9 (DM) – Opportunity Analysis
Question: Assess the merits of Opportunity Analysis in response to the director's concern.

SOA Commentary on Question:

Nearly all candidates correctly pointed out that clinicians using rules-based methods were ineffective at targeting patients for CM intervention, scoring at least partial credit. The candidates that performed best also described several points, explaining the merits of OA.

SOA Answer:

- Studies found that clinicians are not particularly good at identifying high-risk patients
- In a resource-constrained environment, we must carefully consider the economics of program planning which are often ignored or misunderstood by clinicians
- OA provides a structured approach for understanding which subpopulations are amenable to intervention and its likely value
- The structured financial model provides a specific plan with targets to compare to actual outcomes and a framework to help identify areas where the program could be improved

Part c:

Source(s): Valuation of CM Vendors
Question: Describe adjustments to consider for material differences between the two populations.

SOA Commentary on Question:

Most candidates received some credit on this part of the question. Candidates needed to describe, and not just list, adjustments to receive full credit.

SOA Answer:

- Scope
  The definition of included procedures in vendor specific data can change over time as new codes are added and others become obsolete.
- Trend
  Over any significant period of time, changes in average cost per service and utilization must be accounted for. Effect of vendor's introduced care management should be removed.
- Class of claims
  How savings are measured (billed, allowed, or paid dollars or some combination) can affect how calculations should be performed and the trend impact on copay leveraging.
- Seasonality
  If data and/or projections do not comprise complete years, adjustments may have to be made for seasonal patterns in utilization.
- Episodic care
  In some cases where a vendor's activities are specific to a given set of procedures, there can be a corresponding effect on associated procedures not included in the vendor contract.
- Care shifting

If an insurer is going to stop paying, or pay less, for a specific type of claim, it's possible that provider behavior will respond by shifting care to other types of claims that have not been impacted by the vendor's care management.

- Risk adjustment
  Average risk level may vary over time, between covered and noncovered populations, or between test and control populations. Where risk factors are available, they can be used to identify and adjust for such variance.
- Overlap
  If multiple vendors or company initiatives affect the same types of claims for the same population, there is a risk of giving a vendor credit for savings generated by a different initiative.
- Credibility
  The credibility of the measured savings may be limited in cases where vendor activities only affect a small number of people, or experience period is relatively short.
- Delay in claim impact
  A care management initiative may not become fully effective upon implementation. This can have a pronounced effect on savings measurement in the first year and sometimes beyond that.

14. Fall 2023 RM #2

Part a:

Source(s): Duncan 12 (DM) – Act. Control Method

Question: Describe how to initially classify targeted members for the disease management program.

SOA Commentary on Question:

Candidates needed to have the correct ordering for the initial classification of targeted members to receive full credit.

SOA Answer:

1. All eligible health plan members are first split between chronic (aka suitable) members and non-chronic (aka index) members,
2. Then chronic members are split between included members and excluded members,
3. Then included members are split between members targeted for the DM program and those not targeted for the program.

Part b:

Source(s): Duncan 12 (DM) – Act. Control Method

Question: Describe reasons for excluding members from the measured population.

SOA Answer:

member class is not receptive to DM (e.g., residents of LTC, hospice, other institutions) who are under the care of resident clinical personnel.

member is a candidate, but the program is administered by another vendor (e.g., mental health, substance abuse, behavioral condition)

pattern of claims is subject to sharp discontinuity and thus distort a trend calculation.

member's claims are significant and will likely dominate the group and introduce "noise" to the calculation.

ESRD, transplants, HIV/AIDS, Members who are institutionalized (mental health, hospice, or nursing home)

Part c:

Source(s): Duncan 13 (DM) – Risk & Trend

Question: (i) Describe an often-implicit assumption on which the actuarially adjusted historical control methodology relies. (ii) Describe challenges of an actuarially based disease management savings calculation. (iii) Describe how actuaries can address these challenges.

SOA Commentary on Question:

Many candidates had difficulty answering this part of the question.

SOA Answer:

(i) It relies on the equivalence between the populations included in the baseline and measurement period. A criteria is used to decide whether to include a member in the population during baseline and intervention period. We can assume they are comparable and thus equivalent since for each period the population uses the same objective criteria.

(ii) Applying the appropriate trend rate – need to use a trend rate that reflects the expected utilization without intervention. It is difficult to calculate because it's hard to find out the true value without intervention since the group will be managed and thus wouldn't be able to see what would happen without intervention. Equivalence between baseline and measurement period – need to account for changes in mix of continuing, new, and terminating members and changes in condition and comorbidities.

(iii) Applying the appropriate trend rate – should use the nonchronic trend rate since the chronic trend would be impacted by disease management efforts. Should also need to account for average risk between populations and periods.

Equivalence between baseline and measurement period – can be done be reweighting the claims cost of the different groups to account for mix change. In addition, risk adjust the claims cost to reflect the change in risk between periods.

Part d:

Source(s): Duncan 13 (DM) – Risk & Trend

Question: Calculate the trend from Periods 1 to 2 and from Periods 2 to 3. Show your work.

SOA Answer:

	Period 1	Period 1	Period 2	Period 2	Period 3	Period 3
Risk Members	Distribution	Cost	Distribution	Cost	Distribution	Cost
High	5%	$50,000	6%	$50,000	6%	$45,000
Medium	55%	$5,000	54%	$5,000	52%	$5,000
Low	40%	$500	40%	$500	42%	$550
Average		$5,450		$5,900		$5,531
Trend				8.26%		-6.25%

(.05 x 50,000) + (.55 x 5,000) + (.40 x 500) = 5,450
(.06 x 50,000) + (.54 x 5,000) + (.40 x 500) = 5,900 (5,900 / 5,450) – 1 = 8.26%
(.06 x 45,000) + (.52 x 5,000) + (.42 x 550) = 5,531 (5,531 / 5,900) – 1 = -6.25%

Part e:

Source(s): Duncan 12 (DM) – Act. Control Method

Question: (i) Verify the PMPM savings for the member cohort is equivalent on a utilization unit basis and cost basis. Show your work. (ii) Explain the importance of the results in (i).

SOA Commentary on Question:

A lot of candidates had difficulty answering part (ii) for this part of the question.

SOA Answer:

(i)

	Units per 1000	Unit Cost	Cost PMPM
Baseline	100	$8,000	100 x 8000 / 12000 = $66.67
Trend	1.05	1.1	
Trended Baseline	105	$8,800	105 x 8800 / 12000 = $77.00
Actual	99	$8,800	99 x 8800 / 12000 = $72.60
Reduction	6		$77.00 - $72.60 = $4.40
	6 x 8800 / 12000 = $4.40		

The above calculations verifies that both methods generated equivalent savings of $4.40 PMPM.

(ii) The two calculations show the same results. This is because baseline unit cost trend happens to be the same as the actual unit cost.

The importance of the above results lie in that it is essential to have an accurate estimate of unit cost trend from baseline period and whether baseline unit cost multiply by trend will be equal to the actual unit cost in the measurement period will determine the validity of the actuarially control methodology. If these two numbers do not agree, then the savings can be overestimated or underestimated.

15. Spring 2024 RM #2

SOA Commentary on Question:
Most candidates either performed well or performed poorly on this part of the question.

Part a:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's
Question: (i) Explain why it is difficult to demonstrate the link between quality and cost improvement for a disease management (DM) program. (ii) Describe ways to mitigate these difficulties.

SOA Commentary on Question:
Most candidates either performed well or performed poorly on this part of the question.

SOA Answer:

(i) Measurement of financial outcomes is not sufficiently stable (e.g., external factors inadequately controlled).

Measurement techniques not able to detect positive financial outcomes.

Earlier DM programs not focused/not structured to optimize financial outcomes, but established to achieve clinical improvements. For example, to improve HEDIS scores that seldom correlate with financial outcomes.

Program sponsors do not understand the economics of DM programs – do not optimize the program for financial return with respect to resources required.

Some health outcomes may not be associated with financial savings. Increasing evidence that improved quality = lower cost is not necessarily true.

(ii) A better understanding of the economics of DM programs, to help set reasonable expectations.

More rigorous measurement of financial outcomes. Core problem is the way a methodology is applied, assumptions made, and data decisions affect the outcomes.

Reconciliation among DM program savings, overall claims costs, and cost trends.

Part b:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's
Question: Contrast average savings and marginal savings.

SOA Commentary on Question:
Most candidates only stated the two formulas without contrasting them.

SOA Answer:

Average savings = total savings net of program cost / total population.
Average savings tells how profitable the program is overall.

Marginal savings = increase in savings net of program cost due to intervention on the marginal population / marginal population.
Marginal savings tells what kind of program to implement, how large it should be, and whether the marginal intervention is justified.

Part c:

Source(s): Duncan 12 (DM) – Act. Control Method
Question: Calculate the net return on investment (ROI) for the program. Show your work.

SOA Answer:

The model solution for this part is in the Excel spreadsheet.

Part d:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's
Question: Explain how ROI can be a misleading metric.

SOA Commentary on Question:

Most candidates were only able to provide one or two of the following responses.

SOA Answer:

No industry agreement in how to calculate savings or cost.

Comparison of ROI between program and vendor could be misleading.

Planned ROI vs actual ROI likely misleading.

Planned ROI is helpful metric to use in deciding whether to proceed with the program.

Actual ROI will be subject to operational factors that will cause actual ROI to diverge from planned ROI.

Other acceptable answers are –

ROI can be gross or net. Comparison of two ROIs must be on the same basis.

Net ROI can be negative, which is misleading to stakeholders and decision makers.

ROI is a ratio and does not reflect the true dimension of the savings. When comparing two ROIs, a greater ROI doesn't necessarily mean larger savings.

The program may take a long time to be fully efficient and the ROI for early time periods may be low.

16. Spring 2024 RM #6

Part a:

Source(s): Duncan 3 (DM) – CM and Interventions
Question: Describe types of care management programs.

SOA Commentary on Question:

Most candidates performed well on this part of the question. Candidates needed to provide a description of each type of program and not just a list of programs to receive full points.

SOA Answer:

- Care coordination – Integrated records (EHRs) and consistent care delivery to increase health care efficiencies.
- Case management – A health care professional coordinates the care of a patient with a serious disease or illness.
- Concurrent review – "Over the shoulder" nurse practitioner peer review of the physician's treatment plan while the member is receiving services.
- Clinics – Alternative site of care that has downward bias on cost.
- Prior authorizations – Insurer (or PBM) is made aware of an often-expensive treatment/prescription that could potentially be handled with an alternative measure. Insurer/PBM approval is required before service is rendered.
- P4H/PCMH (Patient Centered Medical Home) – Patient-centric and quality-focused payment models.
- Population health management – Intervention in which a broad set of medical conditions is addressed by looking at the population as a whole irrespective of its conditions.
- Pharmacy services – Focus on certain care management programs that can be led by pharmacists, including generic utilization review and medication adherence programs.
- Disease management – Focuses on chronic conditions with certain common characteristics that make them suitable for clinical intervention, such as coronary artery disease, diabetes, chronic obstructive pulmonary disease, asthma, and heart failure.
- Demand management – Informational intervention that is often provided by clinical staff over the telephone.
- Bundled Payment Initiatives – Alternative payment model that transitions utilization risk to the provider by providing one lump sum payment to cover all services associated with an episode of care.
- Specialty case management – Performed by a care manager who has expertise in a particular area and to whom the MCO has assigned primary responsibility for coordinating the patient's care.
- Telehealth – Over the phone healthcare (or video), allowing more frequent contact with members that have trouble accessing providers consistently.
- ACO (Accountable Care Organization) – Alternative payment model with shared savings elements with providers.
- Gaps in care and quality improvement initiatives – Used to improve the quality and quantity of care for members as needed.

In the Excel spreadsheet, you are provided data for members eligible for a palliative care management program. The goal of the program is to reduce total inpatient (IP) admissions and emergency department (ED) visits by at least 10% each.

Part b:

Source(s): Duncan 11 (DM) – Propensity Scoring

Question: Evaluate whether the program achieved its goal using the following approaches. Show your work: with matching and without matching

SOA Commentary on Question:

Candidates generally did well on this part of the question, if the candidate matched on individual age, gender, and county characteristics, as the dataset included exactly one candidate in the program and one candidate not in the program with these same demographic characteristics. Candidates who did not earn full points either often did not match on all three characteristics, did not correctly calculate the reduction in utilization, or did not state whether the program achieved its goal.

SOA Answer:

The response for this part is to be provided in the Excel spreadsheet.

Part c:

Source(s): Duncan 11 (DM) – Propensity Scoring

Question: Recommend an approach from part (b). Justify your response.

SOA Commentary on Question:

Few candidates received full points on this part of the question. Candidates generally did not provide enough justification for their recommendation and often just listed their results from part (b).

SOA Answer:

- The two groups of members, the treatment and control groups, are not equivalent.
- Males comprised 56% of the treatment group and only 47% of the control group.
- Matching was done to account for some differences between these two groups.
- Members could be matched based on having exact characteristics. For every member in the intervention group, there is exactly one member in the control group with the same provided demographics.
- This population was small enough such that matching could be performed on members having the same characteristics.
- Recommend matching for part (b)

17. Fall 2024 RM #2

SOA Commentary on Question:

Most candidates performed well on this question. Some candidates struggled with part (a) but performed well on parts (b) and (c). Part (a) asked candidates to describe medical management programs. Candidates needed to describe these programs versus providing only a list to receive full credit.

Part a:

Source(s): Duncan 3 (DM) – CM and Interventions

Question: Describe common features of medical management interventions aimed at patients and providers.

SOA Answer:

1.) All rely heavily on identification of at-risk members, often through medical claims and sophisticated scoring (identification and stratification) algorithms.
2.) More recent models attempt to integrate clinical data into the identification and prediction process
3.) All rely on some form of standardized treatment or evidence-based care. The at-risk patient is then either encouraged to seek best-practice care (in the case of third-party programs) or the treating physician is expected to comply with evidence-based guidelines.
4.) All rely on clinical resources to perform evaluation of the patient's condition (with assistance where possible form automated systems such as gaps-in-care algorithms or telemedicine) and either practice according to evidence-based guidelines or to provide coaching for those members whose care deviates from best practice guidelines.
5.) All rely (to some degree) on participation by the member or patient in the member's own care. The newer models leverage internet portal technology to provide the clinician and the patient with information, and in addition for the patient, to schedule appointments and provide reminders when necessary.
6.) All have proven to be difficult (to a greater or lesser degree) to assess and justify financially

Part b:

Source(s): Duncan 8 (DM) – Econ. of CM Prog's

Question: (i) Explain challenges with demonstrating the link between quality and cost improvement. (ii) Describe factors to resolve these challenges.

SOA Answer:

(i)

1. The measurement of financial outcomes is not sufficiently stable (e.g., subject to variation or external factors that have been inadequately controlled), or our measurement techniques are not sufficiently sensitive to be able to detect positive financial outcomes
2. Programs (particularly early DM programs) were either not focused on financial outcomes or were not structured to optimize the financial outcomes. Programs were often implemented by Medical Management Department or were established to achieve clinical improvement. Many

programs, for example, are designed to improve HEDIS scores or improve patient clinical outcomes, but few clinical HEDIS measures are correlated with short-term financial outcomes.
3. Program sponsors do not understand the economics of DM programs and therefore do not optimize the programs for financial return in relation to the resources required.
4. Some health outcomes appear not to be associated with financial savings. There appears to be increasing evidence that improved quality = lower cost is not necessarily true. Some quality improvement may increase cost overall, but still be worth the investment on other grounds.

(ii)

1. A better understanding of the economics of DM programs, to help set reasonable expectations.
2. More rigorous measurement of financial outcomes. Core problem is the way a methodology is applied, assumptions made, and data decisions affect the outcomes.
3. Reconciliation among DM program savings, overall claims costs, and cost trends.

Part c:

Source(s): Duncan 3 (DM) – CM and Interventions
Question: Contrast: (i) care management and utilization management. (ii) pre-authorization and concurrent review.

SOA Answer:

(i)

1. Utilization management has traditionally focused on providers and has acquired a negative connotation
2. Care management is a broader term that fosters patient participation and includes healthcare professionals that are not physicians
3. Utilization management is essentially "downstream" management of medical services through processes such as pre-authorization, concurrent review, etc.
4. Care management has focused more on "upstream" prevention of illness and improving the quality of care delivered.

(ii)

1. Pre-authorization requires the physician or hospital to obtain approval for a procedure or medical service prior to performing it.
2. Concurrent review occurs while the member is receiving care or is hospitalized.
3. Pre-authorization is generally applied to inpatient procedures, although it is increasingly being used for certain outpatient procedures, e.g., advanced imaging, and high-cost outpatient drugs.
4. Concurrent review traditionally occurs while a member is in an acute hospital or nursing home

18. Fall 2024 RM #6

SOA Commentary on Question:

The sections of this question tested the candidates understanding of what propensity score matching (PSM) is. It also tests the candidate's ability to interpret the results of a propensity matched study.

Part a:

Source(s): Duncan 11 (DM) – Propensity Scoring

Question: Verify the accuracy of the following statements. Justify your response.

(i) Propensity score matching (PSM) is a technique for estimating what would happen to a population if a program was implemented.

(ii) PSM reduces a large number of variables into a few key scores that allow for more effective matching.

(iii) PSM should consider the variables themselves when matching and not just rely on PSM scoring alone.

(iv) PSM has many advantages including matching on both observed and unobserved variables.

SOA Commentary on Question:

Most candidates performed well on this part of the question

SOA Answer:

1.) False: PSM is a technique for estimating what would happen to a population if a program was **Not** implemented

2.) False: PSM reduces many variables into a **single score** that allows for more effective matching

3.) True: When matching, variables other than the single score should be considered during the matching process

4.) False: One of the shortfalls of PSM is that it **does not** match on non-observed variables

Part b:

Source(s): Duncan 11 (DM) – Propensity Scoring

Question: (i) Describe methods used for PSM. (ii) List important considerations for matching.

SOA Commentary on Question:

Most candidates performed well on this part of the question.

SOA Answer:

(i)

a. Nearest neighbor matching: First member of comparison population with closest score is matched

b. Caliper matching: Match is made if member and match's propensity score are within a fixed difference

c. Mahalanobis metric matching: Metric that can be used to measure the dissimilarity between two vectors

d. Stratification matching: Technique called coarsened exact matching in which observations are stratified and then matched by stratum

(ii)

a. With or without replacement?
b. What determines the closeness of a match?
c. What constitutes a satisfactory percentage of matched members?

Part c:

Source(s): Duncan 11 (DM) – Propensity Scoring
Question: Compare and contrast results from the matched and unmatched studies, with respect to the hypotheses.

SOA Commentary on Question:

Some candidates became distracted by metrics in the table that were not relevant to the hypothesis. Many of those candidates became fixated on the P-values provided which, while important, were not at the heart of the question. Those that connected the hypothesis to metrics that spoke to DSME/T, medication adherence, admissions, and costs in both the matched and unmatched study generally performed better on this part of the question.

SOA Answer:

Comparison:
In the propensity matched study and the unmatched study, education/1000 and medication adherence is higher for low cost-sharing members than high cost-sharing members,

Contrast:
In the propensity matched study, Diabetes admits/1000 is a more reliable metric and shows that the low-cost sharing members have lower admits/1000. The unmatched study shows higher admit/1000 in the low-cost sharing members than the high cost-sharing members.

Cost per diabetes admit is similar for both studies but you can see a clear reduction in overall Inpatient claims PMPM in the matched study that does not exist in the unmatched study.

Part d:

Source(s): Duncan 11 (DM) – Propensity Scoring
Question: Describe considerations for testing the results of a PSM model.

SOA Commentary on Question:

Almost all candidates received some credit on this part of the question, although few provided enough detail to receive full credit.

SOA Answer:

1. Test for appropriateness
2. Test for bias
3. Should control for unequal distribution of covariates between intervention and comparison populations
4. Ensure the model is parsimonious
5. Validate that the matched sample satisfactorily adjusts for observed differences
6. Minimum visual comparison between treatment and comparison populations is required

19. Fall 2024 RM #8

SOA Commentary on Question:

Most candidates performed well on parts (a) and (b). Candidates needed to provide descriptions for these parts of the question versus only a list of programs or variables to receive full credit. For part (c), many candidates struggled and set MPR and PDC to the same values.

Part a:

Source(s): Duncan 3 (DM) – CM and Interventions

Question: Describe care management programs that could be implemented by a health plan.

SOA Answer:

1. Pre-authorization: Requires that a physician or hospital obtain approval from a Managed Care Organization before performing a diagnostic procedure or surgical intervention on a health plan member.
2. Concurrent review: Involves monitoring a health plan member's care while the member is still receiving care in an acute hospital or nursing home.
3. Case management: A health care professional coordinates the care of a patient with a serious disease or illness.
4. Demand management: Informational intervention that is often provided by clinical staff over the telephone.
5. Disease management: Focuses on chronic conditions with certain common characteristics that make them suitable for clinical intervention, such as coronary artery disease, diabetes, chronic obstructive pulmonary disease, asthma, and heart failure.
6. Specialty case management: Performed by a care manager who has expertise in a particular area and to whom the MCO has assigned primary responsibility for coordinating the patient's care.
7. Population health management: Intervention in which a broad set of medical conditions is addressed by looking at the population as a whole, irrespective of its conditions.

Other acceptable responses (with descriptions):

8. Patient centered medical home
9. Accountable care organizations
10. Non-traditional provider interventions and care settings
11. Gaps in care and quality improvement programs
12. Telehealth, telemedicine and automated monitoring systems
13. Bundled payment initiatives

Part b:

Source(s): Valuation of CM Vendors

Question: Describe variables that should be considered when measuring the medical cost savings of a care management program on different populations.

SOA Answer:

1. **Scope.** When a vendor arrangement is defined by specific data, such as procedure codes, the definition of included procedures can change over time as new codes are added and others become obsolete. Such changes in scope must be documented regularly, and savings analysis must account for them.

2. **Trend.** Over any significant period of time, changes in average cost per service must be accounted for. Changes in average utilization must also be considered—the effect of the vendor's introduced care management should be removed by identifying market utilization based on nonparticipating membership, external benchmarks or some other source that is not significantly affected by the vendor.
3. **Class of claims.** Will savings be measured in terms of billed dollars, allowed dollars, paid dollars or some combination? This may affect how calculations should be performed; for example, trend could have a higher impact on paid dollars than on allowed dollars due to copay leveraging.
4. **Seasonality.** If data and/or projections do not comprise complete years, adjustments may have to be made for seasonal patterns in utilization.
5. **Episodic care.** In some cases where a vendor's activities are specific to a given set of procedures, there can be a corresponding effect on associated procedures not included in the vendor contract. For example, if specific types of surgery are managed, all other claims associated with the day of an outpatient surgery, or the admitted days of an inpatient surgery, should be considered in calculating savings.
6. **Care shifting.** If an insurer is going to stop paying, or pay less, for a specific type of claim, it's possible that provider behavior will respond by shifting care to other types of claims that have not been impacted by the vendor's care management. For example, if the fictitious procedure HCPCS = AAAAA has a near-equivalent procedure HCPCS = BBBBB, a certain amount of utilization that appears to have been prevented for AAAAA might simply shift to BBBBB. This possibility must be allowed for in savings projections.
7. **Risk adjustment.** Average risk level may vary over time, between covered and noncovered populations, or between test and control populations. Where risk factors are available, they can be used to identify and adjust for such variance.
8. **Overlap.** If multiple vendors or company initiatives affect the same types of claims for the same population, there is a risk of giving a vendor credit for savings generated, in whole or in part, by a different initiative.
9. **Credibility.** Some vendor activities only affect a small number of people, or one might be analyzing a relatively short experience period. In either case, the credibility of the measured savings may be limited.
10. **Delay in claim impact.** A care management initiative may not become fully effective upon implementation. It may take a while for providers' practice patterns to reach full effectiveness or to build up a managed population when active enrollment in an initiative is required. This can have a pronounced effect on savings measurement in the first year and sometimes beyond that.

Part c:

Source(s): Duncan 3 (DM) – CM and Interventions

Question: (i) Calculate the Medication Possession Ratio (MPR) and the Proportion of days covered (PDC) for this member. Show your work. (ii) Evaluate whether the Medicare STAR measure of 80% adherence has been met. Show your work. Justify your response.

SOA Answer:

The model solution for this part is in the Excel spreadsheet.

20. Fall 2024 RM #9

SOA Commentary on Question:

Candidates were expected to understand changes in risk adjustment program affecting market stability and profitability of the ACA and know the recommended actuarial practices regarding input data used for risk adjustment models. This included understanding how to evaluate hybrid Risk Adjustment Models, including both diagnosis and prescription drugs.

Part a:

Source(s): Creating Stability in Unstable Times

Question: Explain the impact of the following changes to the CMS risk adjustment program between 2017 and 2019, on profitability and stability of the Individual Health Insurance market: Durational impact; Administrative load; Pharmacy data; Risk adjustment weights; Claims pooling

SOA Commentary on Question:

Most candidates performed well on this part of the question.

SOA Answer:

Durational impact

- In 2017, an adjustment was added for partial year enrollees.
- The relative profitability between full- and partial-year SEP enrollees is expected to be much closer.

Administrative load

- In 2018, the administrative load reduced by 14%
- Risk adjustment transfers will be based only on claim amounts and variable administrative components,
- This may improve the profitability of healthier members with no medical conditions and decrease the profitability of members with conditions triggering a risk adjustment payment.

Inclusion of pharmacy data

- In 2018, pharmacy data will be incorporated, which has the potential to alter the results significantly. CMS has yet to release the details for this portion of the risk adjustment model.

Updated weights

- Any update to the risk adjustment weights assigned to medical conditions will change the risk adjustment transfers
- Updates to weights should more accurately capture relative costs by medical condition since the changes are likely to take into account recent changes in costs, such as changes in high-cost drugs.
- The current proposal for 2019 is to include, for the first time, actual ACA data to establish the weights. This could also significantly impact future results.

Pooling mechanism

- The risk adjustment methodology is also including a pooling mechanism for 60 percent of costs of any claimant with claims above a $1 million threshold.
- The issuer will not be directly responsible for 60 percent of a person's costs above the threshold.
- It will protect issuers who have catastrophic level claims.

Part b:

Source(s): ASOP #45 – The Use of Risk Adj.

Question: Describe considerations for the consistency of input data used in the application of risk adjustment methodologies, according to ASOP 45.

SOA Commentary on Question:

Almost all candidates received some credit on this part of the question, although few provided enough detail to receive full credit.

SOA Answer:

- Input data should be reasonably consistent with the type of data used to develop the model.
- Input data should be reasonably consistent across organizations, populations, and time periods.
- If such consistency is not possible, the actuary should document why the combination of that data and the selected model was used,
- The actuary should document any adjustments made to the data, model, or methodology to address limitations in the data.
- If sufficient information concerning the quality and type of input data used to develop or apply the model is not available, the actuary should consider whether use of the model is appropriate.
- The actuary should consider the differences in provider contracts and the potential impact of these differences on the risk adjustment results.
- The actuary should determine how the model handles diagnostic services and whether data for those services should be included in the data input into the model.
- The actuary should consider the impact of differences in the accuracy and completeness of coding across organizations and time periods.

Group and Health Course 301
Curated Past Exam Solutions
Learning Objective #3: Healthcare Risk Adjustment
Applicable SOA Questions: Fall 2020 to Fall 2024
Model Solutions

Contents

1. Fall 2022 FV #6

SOA Commentary on Question:

The question was looking to test the candidates understanding of risk adjustments and considerations within the Medicaid. Candidates did a good job on this first part of the question but as the question progressed candidates did not provide sufficient details for full credit in most circumstances; however, most candidates received partial credit throughout the question.

Part a:

Source(s): Risk Adj. in State Medicaid Programs

Question: Define the following important time periods used in risk adjustment. (i) Experience period, (ii) Rate period.

SOA Answer:

The experience period is the data collection period for the analysis. This period precedes the rating period and it is usually 12 months in duration.

The rating period is the time period for which the capitation payments will be made. This period usually follows the experience period and there is typically 3 to 9 months between the end of the experience period and the beginning of the rating period.

Part b:

Source(s): Risk Adj. in State Medicaid Programs

Question: Describe major considerations when deciding whether risk adjustment should apply to a beneficiary rate category.

SOA Answer:

Major considerations include:

- What degree does health status vary among beneficiaries in the rate category?
  - Supplemental Security Income populations (such as aged, blind, disabled) exhibit significant variation
- Will the risk adjustment system appropriately capture the health status variations for that category?
  - Temporary assistance to needy families population has less variation but does have chronic disease variations among adults and children
  - Temporary assistance to needy families population has higher turnover and most beneficiaries may not have chronic claims
  - Costs for pregnant women are often paid through a kick payment versus an explicit risk adjustment

Part c:

Source(s): Risk Adj. in State Medicaid Programs

Question: Explain the advantages of both risk adjustment methods to Sunny State.

SOA Answer:

- Prospective risk adjustment uses the experience period data to estimate morbidity in a future period

- Concurrent risk adjustment uses the experience period data to estimate morbidity for the same time period
- Prospective risk adjustment doesn't consider conditions that would not be expected to continue to produce cost (i.e., acute conditions)
- Concurrent risk models would generally recognize relative morbidity associated with acute conditions
- Concurrent risk models require retrospective capitation payments because of claim payment timing
- Concurrent risk models do the best job of estimating variation in relative risk between health plans
- Retroactive adjustments aren't generally favored by states or health plans so most opt for the prospective model

Part d:

Source(s): Risk Adj. in State Medicaid Programs

Question: Compare and contrast the application of individual and aggregate risk adjustment factors in the calculation of a health plan's capitation rate.

SOA Answer:

All risk adjustment systems calculate a risk score for each individual

Individual risk adjustment option:

- Risk scores follow the beneficiary throughout the system
- Health plan risk adjustment factor is the weighted average of individual risk scores for the period
- New enrollee risk score is based off demographic factors
- Individual risk scores recognize shifts in enrolment, particularly during initial enrolment

Aggregate risk adjustment option:

- Average risk score for enrollees during the experience period is assumed to represent the average risk on enrollees during the rating period
- Health plan risk adjustment factor is the weighted average of the risk scores for the beneficiaries enrolled during the waiting period
- New enrollees are assigned the same weighted average risk score as existing beneficiaries

2. Fall 2020 SPC #5

SOA Commentary on Question:

This question was meant to test candidate's understanding of Risk Adjustment and its application. Further commentary is provided for each section below.

Part a:

Source(s): Duncan 21 (Risk) – Risk Adj. ACA Exchanges

Question: Describe issues with the Massachusetts risk adjustment and National risk adjustment processes.

SOA Commentary on Question:

In order to receive full credit for this portion of the question, candidates needed to provide a meaningful description of the issues, rather than just listing them.

SOA Answer:

Issues that impacted the Massachusetts risk adjustment process and the National risk adjustment process include:

- Risk adjustment applies to the gross premium, and thus transfers part of the expense margin in addition to excess claims
- Bias against zero-condition members – members may not have any conditions mapped due to being new to a health plan or having a condition that is not part of the HCC mapping, but may still incur claims significant claims
- Bias against limited network or lower cost plans – these tend to be lower cost, allowing a plan to charge lower premiums (compared to the statewide average), as well as being less attractive to members with health conditions that require frequent provider visits (these members are more likely drive higher risk scores, which is beneficial to the plan in terms of risk transfer calculations).
- Risk adjustment operates at the state, rather than the regional level – wide variations in networks, costs, and utilization can exist within a state. This is similar to the effect of low-cost network.
- Partial year enrollment – new entrants who enter partway through the year have fewer months to accumulate diagnoses that map to HCCs but may still experience acute episodes of expenses over a short time.
- Lack of historical data – ACA uses a concurrent model with only one year of claims data. Even members with chronic conditions may fail to have claims for those conditions in successive years, which will reduce the member's risk score.

Other issues that could have been described:

- Only a fraction of members trigger conditions
- Prospective vs. concurrent models
- Market-share

Part b:

Source(s): Duncan 21 (Risk) – Risk Adj. ACA Exchanges

Question: You are given the following information:

	State	Blue Note	Yellow Bird
Actuarial value (AV)	0.7	0.7	0.7
Allowable Rating Factor (ARF)	1.952	1.952	1.952
Member Months	24,000	9,600	14,400
Risk x Induced Demand x Geographic	1.0368	0.936	1.104

Average Premium PMPM	$500	$440	$540
Total Premium	$12,000,000	A	B
Target Loss Ratio for Pricing	N/A	85%	85%
Claims	$10,200,000	$3,590,400	$6,609,600
ACA risk adjustment transfer amount	C	D	E
Net Income		F	G
Net Income as % of Premium		H	I

Calculate the values for A through I in the table above. Show your work.

SOA Commentary on Question:

Nearly all candidates were able to calculate total premium. Fewer candidates were able to derive the correct risk adjustment transfer amounts. Partial credit was given to candidates who were able to complete some, but not all, of the calculations or who provided formulas and an understanding of the calculation.

SOA Answer:

	State	Blue Note	Yellow Bird
Actuarial value (AV)	0.7	0.7	0.7
Allowable Rating Factor (ARF)	1.952	1.952	1.952
Member Months	24,000	9,600	14,400
Risk x Induced Demand x Geographic	1.0368	0.936	1.104

Average Premium PMPM	$500	$440	$540
Total Premium	$12,000,000	4,224,000	7,776,000
Target Loss Ratio for Pricing	N/A	85%	85%
Claims	$10,200,000	$3,590,400	$6,609,600
ACA risk adjustment transfer amount	$0	(-466,667)	466,667
Net Income		166,933	1,633,067
Net Income as % of Premium		4%	21%

See the accompanying Excel file for the full solution

3. Fall 2020 SPC #6c-d

Part c:

Source(s): Duncan 13 (Risk) – Medicaid Risk Adj.

Question: Explain why the Arizona Medicaid risk adjustment methodology for Temporary Assistance for Needy Families (TANF) is applicable to newborns but not applicable to other cohorts.

SOA Commentary on Question:

Most candidates got the first point and some could elaborate for a more full explanation.

SOA Answer:

- The methodology for other groups is a prospective methodology (based on prior year claims). Newborns have no prior year claims.
- The methodology for newborns was changed to a retrospective (concurrent) methodology.
- The claims of the prior cohort of newborns in the experience period are used to project newborn experience in the rating period.
- This approach assumes that while the specific newborns in any health plan will change from the experience period to the rating period, health plans attract newborns with a consistent health status mix over time.

Part d:

Source(s): Duncan 13 (Risk) – Medicaid Risk Adj.

Question: The following information is given for a Managed Care Organization (MCO) in the Arizona Medicaid program for the contract year ending 2017:

Cohort	Cohort Weight	Condition Episode Risk Group (ERG) Factor	Age/ Sex Factor
Long Cohort	0.8	0.36	0.4
Short Cohort	0.2	N/A	0.36

- Weighted Condition Factor for all MCOs in Arizona is 0.3652.

(i) Describe how enrollment is determined for the Long Cohort.

(ii) Calculate the Relative Risk Score for the MCO. Show your work.

(iii) Explain how the risk adjustment factor is applied to the base capitation rates to develop the adjusted capitation rates.

SOA Answer:

(i)

- The long cohort consists of those members who have at least 6 months of eligibility during the experience period
- If a member has a break in coverage during the experience period, months before and after the break are counted.

(ii)

- Relative Health Factor:

- 0.3600/0.4000 = 0.9000
- Imputed Condition Factor (Short Cohort):
  - 0.9000 x 0.3600 = 0.324
- Weighted Condition Factor (Short Cohort):
  - 0.5 x 0.3240 + 0.5 x 0.3600 = 0.3420
- Total Average Risk Score for the Health Plan:
  - 0.8 x 0.36 + 0.2 x 0.342 = 0.3564
- Relative Risk Score:
  - 0.3564/0.3652 = 0.9759

(iii)

- The risk adjustment factor is applied to the actual base capitations after bid admin, risk contingency margin, and premium tax elements have been backed out of the actual base capitation rates. These items are added back after the risk adjustment factor is applied.

4. Spring 2021 SPC #3a

Part a:

Source(s): Creating Stability in Unstable Times

Question: Describe the elements of the Affordable Care Act (ACA) designed to ensure a balanced risk pool.

SOA Commentary on Question:

Candidates were asked to describe the elements of ACA programs to ensure a balanced risk pool. Most candidates did well in this section describing 4 or more items to receive full points. Candidates who listed without describing received partial points.

SOA Answer:

1. Individual Mandate – is a tax penalty on individuals who are deemed able to afford coverage but choose not to purchase it.
2. Subsidies – Tax credits are calculated relative to the second lowest cost silver plan in an enrollee's area and reduce premiums to a fraction of the cost they would be otherwise.
3. Temporary Risk Stabilization Programs
   a. Risk Corridor –a transitional program intended to protect issuers from large losses in the first three years of the ACA.
   b. Transitional Reinsurance Program – intended to reduce premiums as well as reduce the risk to issuers by covering a portion of large claims.
4. Risk Adjustment – intended to equalize the profitability of members such that issuers were not benefited or hurt from enrolling a certain type of member.
5. Outreach and advertising – are key factors in maintaining and increasing enrollment to those who are eligible but have not enrolled.
6. Medicaid expansion – meant that individuals with incomes between 100 percent and 138 percent FPL would be part of the Medicaid program rather than the individual market.
7. Special enrollment periods – are exceptions where enrollment is allowed outside of the open enrollment period.
8. The ability to develop adequate rates – requires a stable regulatory environment and knowledge of the risk pool. Changes to the covered population—such as churn in the market, significant changes in total enrollment levels, and the entrance of transitional enrollees in some states—continued to make rating a challenge.

5. Spring 2021 SPC #5a

Part a:

Source(s): ASOP #45 – The Use of Risk Adj.

Question: According to ASOP 45,

(i) Describe how the input data used in the application of risk adjustment needs to be reasonably consistent.

(ii) Explain what the actuary should do if reasonable consistency cannot be achieved or if information concerning the quality and type of input data is not sufficient

(iii) Explain what the actuary should consider when evaluating consistency of input data.

SOA Commentary on Question:

Most candidates performed well on parts i) and ii). Very few candidates received full points for part iii).

SOA Answer:

(i) The input data need to be reasonably consistent

- With the type of data used to develop the model
- Across Organizations
- Populations
- Time periods

(ii) If reasonably consistent data cannot be achieved or input data is not sufficient, the actuary should:

- Document why the combination of that data and the selected model was used.
- Apply and document any adjustments made to the data, the model, or the methodology to address limitations in the data.
- If sufficient information concerning the quality and type of input data used to develop or apply the model is not available, the actuary should consider whether use of the model is appropriate.

(iii) When evaluating the consistency of input data, the actuary should consider the following:

- Differences in provider contracts and how these differences can cause significant difference in risk adjustment results. For example, differences in results due to data quality rather than morbidity.
- Determine how the model handles diagnostic services and whether data for those services should be included in the data input into the model.
- The impact of differences in the accuracy and completeness of diagnosis and services coding across organizations and time periods.
- The actuary should consider whether adjustments to the risk adjustment process are appropriate.

6. Fall 2021 SPC #2

SOA Commentary on Question:

Most candidates performed well on parts a) and d) while fewer candidates performed as well on parts b) and c).

Part a:

Source(s): Creating Stability in Unstable Times
Question: Describe state-level considerations for stabilizing the Affordable Care Act (ACA) marketplace.

SOA Commentary on Question:

Candidates who recalled the Other State Stabilization Initiatives section of the Creating Stability in Unstable Times article, or provided similar considerations, received credit for this part of the question.

SOA Answer:

- Change in age factors or the subsidy structure to encourage younger individuals to enroll.
- Potentially altering the rating areas to encourage issuer participation in at-risk or potentially bare counties. States may also consider how other state-based, like reinsurance, might favor at-risk counties to encourage more issuer participation in these counties.
- Require Medicaid managed care organizations to participate in the individual market as a condition for Medicaid participation.
- A state-based option where a state would operate a plan in the market, either statewide or in counties with fewer participating issuers.
- A Medicaid buy-in could allow individuals to purchase Medicaid coverage.
- Programs or regulations that might impact the overall cost and quality of health care in the individual market long term in hopes of "bending the trend". For example, requirements for value-based care.
- Long-term solutions to address overall health care costs and cost trends going forward. The reinsurance programs that states are implementing will help lower premiums in the short term, but it is unlikely it will truly bend the cost curve.

- It is continually difficult for issuers to rate appropriately since their mix of members can change significantly from year to year. Regulators need to be active in reviewing not only the rates, but understanding market dynamics to ensure that issuers are prepared and rates are sufficient for whatever changes may come.

Part b:

Source(s): Creating Stability in Unstable Times
Question: Propose questions and additional data that are necessary to assess the stability of the state's marketplace. Justify your answer.

SOA Commentary on Question:

*Only candidates who proposed questions / requested additional data **and** gave justification received full credit for this part of the question.*

SOA Answer:

- There are too many uninsured in the state, with not enough young and healthy enrollees, leading to instability in the market.
- The relative profitability for PPO plans is notably worse, which may result in the removal of PPO plans from the state.
- The relative profitability for Platinum is significantly worse, which may result in the removal of Platinum plans in the market. This may also impact gold plan profitability if all platinum members migrate to a gold plan.
- Younger demographics appear to be less profitable after risk adjustment. A change in age factors may be necessary to improve profitability at younger ages but may deter enrollment at these ages due to higher premiums.

Part c:

Source(s): Creating Stability in Unstable Times
Question: (i) Describe 1332 waivers (state innovation waivers) and examples of how some states have utilized them to date. (ii) Describe considerations for determining whether your state should apply for a 1332 waiver.

SOA Commentary on Question:

Some candidates conflated the Individual Market's 1332 waiver for other types of waivers.

SOA Answer:

(i)

- These started in 2017 from a change in the ACA.
- Used to improve the stability of the individual market.
- States can change portions of the ACA if the changes meet a certain set of requirements (guard rails).
- Most waivers are to create state-based reinsurance programs.
- Reinsurance programs can include claims-based or condition-based programs.
- Funded from outside the individual market, including from federal.

(ii)

- The state can set up a reinsurance program to lessen some of the larger losses insurers may face on segments of their business.
- Introducing state-based reinsurance programs can lower premiums.
- State may not desire to stabilize its market.
- The state may have difficulty funding the state-based reinsurance program.
- The added complexity may not be worth the benefit of the waiver.

Part d:

Source(s): ASOP #45 – The Use of Risk Adj.
Question: List considerations for assigning risk scores to individuals with limited data, according to ASOP 45.

SOA Commentary on Question:

Candidates generally performed well on this part of the question. Some candidates listed the general sections of ASOP 45 instead of the specific considerations for individuals with limited data.

SOA Answer:

- The actuary should consider minimum criteria required for an individual to be included in the risk adjustment analysis.
- Where these minimum criteria are not met, the actuary should identify an appropriate measure of morbidity to be used.
- Approaches to handling these individuals include, but are not limited to,
  - Assigning an age/gender factor
  - Assigning an average risk score for the scored individuals
  - Excluding them from the analysis while also dampening the results

7. Spring 2022 SPC #5

Part a:

Source(s): Changing w. the Times – ACA Risk Adj
Question: Identify notable changes in ACA Risk Adjustment over the life of the program.

SOA Commentary on Question:

Most candidates were able to identify several notable changes in ACA Risk Adjustment over the life of the program. Candidates who were able to identify some of the changes, but not all, received partial credit.

SOA Answer:

- Annual Coefficient recalibrations to reflect more recent data
- Transition to a model assigning hierarchical condition categories (HCCs) through ICD10 codes (2015)
- Addition of duration factors reflecting the length of a member's enrollment with an issuer (2017)
- Addition of prescription drug classes (RxCs) to better account for claims costs for certain conditions (2018)
- Reduction of the statewide average premium by 14 percent to proxy issuer administrative costs and change transfers to a paid claims basis (2018)
- Addition of high-cost risk pool (HCRP) for members with annual paid claims over $1M (2018)
- First adjustments from prior year risk adjustment data validation (RADV) audits (2018)
- Begin phase-in of External Data Gathering Environment (EDGE) data in coefficient calibration (2019)
- Update condition categories calibrated from data with ICD-10 codes

Part b:

Source(s): Duncan 13 (Risk) – Medicaid Risk Adj.
Question: Calculate the risk adjusted capitation rates for ABC Insurance Company. Show your work.

SOA Commentary on Question:

Most candidates were able to calculate the risk adjusted capitation rates. To receive full credit, candidates needed to calculate the risk adjusted capitation rates for TANF, SSI w/Medicare, SSI w/out Medicare, and non-Medicaid. Partial credit was given to candidates who were able to perform some of the following calculations, but were unable to correctly determine the final risk adjusted capitation rates.

SOA Answer:

Imputed ERG Factor for Short Cohort = $0.3910 \div 0.4000 \times 0.3500 = 0.3421$

Weighted Condition Factor = $0.5 \times$ Age/Sex Factor + $0.5 \times$ Imputed ERG =
$0.5 \times 0.35 + 0.5 \times 0.3421 = 0.3461$

Total Average Risk Score = $0.82 \times 0.3910 + 0.18 \times$ Short Cohort Weighted Condition Factor $(0.3461) = 0.3829$

Relative Risk Score = 0.3829 ÷ 0.4028 = 0.9506

Relative Risk Score with Phase-In: 0.8 × 0.9506 + 0.2 × 1.0000 = 0.9605

Risk Score Adjustment to Cap Rate = 0.9605 × 1.0 = 0.9605

Cap Rate to be risk-adjusted (TANF) = 100 – 2 – 8 – 2 = $88

Cap Rate to be risk-adjusted (SSI w/ Medicare) = 150 – 3 – 12 – 3 = $132

Cap Rate to be risk-adjusted (SSI w/out Medicare) = 700 – 14 – 56 – 14 = $616

Cap Rate to be risk-adjusted (non-Medicaid) = 150 – 10 – 40 – 10 = $90

Risk Adjusted Cap Rate (TANF) = 88 × 0.9605 = $84.52

Risk Adjusted Cap Rate (SSI w/Medicare) = 132 × 1.0134 = $133.77

Risk Adjusted Cap Rate (SSI w/out Medicare) = 616 × 1.0009 = $616.55

Risk Adjusted Cap Rate (non-Medicaid) = 90 × 0.9974 = $89.77

Risk Adjusted Premium Tax PMPM (TANF) = 2 × 0.9605 = $1.92

Risk Adjusted Premium Tax PMPM (SSI w/Medicare) = 3 × 1.0134 = $3.04

Risk Adjusted Premium Tax PMPM (SSI w/out Medicare) = 14 × 1.009 = $14.01

Risk Adjusted Premium Tax PMPM (non-Medicaid) = 10 × 0.9974 = $9.97

Risk Adjusted Capitation Rate (TANF) = 84.52 + 2 + 8 + 1.92 = $96.45

Risk Adjusted Capitation Rate (SSI w/Medicare) = 133.77 + 3 + 12 + 3.04 = $151.81

Risk Adjusted Capitation Rate (SSI w/out Medicare) = 616.55 + 14 + 56 + 14.01 = $700.57

Risk Adjusted Capitation Rate (non-Medicaid) = 89.77 + 10 + 40 + 9.97 = $149.74

8. Fall 2022 SPC #2c

Part c:

Source(s): Duncan 14 (Risk) – Risk Adj. - Medicare

Question: The projection of a Medicare Advantage plan's risk scores from the base period to the bid contract year includes several factors. (i) Describe each factor. (ii) Identify the source of each factor.

SOA Commentary on Question:

Most candidates listed factors but did not describe them. Candidates knew the terms normalization factor and coding adjustment, but struggled to clearly articulate what they were.

SOA Answer:

- **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.
- Source: The risk score trend is developed by the Medicare Advantage Organization (MAO)

- **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.
- Source: annual population change is developed by the Medicare Advantage Organization (MAO)

- **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.
- Source: Provided by CMS

- **CMS Coding Adjustment** accounts for coding differences between Medicare Advantage and traditional Medicare FFS.
- Source: Provided by CMS

9. Fall 2022 SPC #5

Part a:

Source(s): Changing w. the Times – ACA Risk Adj

Question: (i) Describe the prominent patterns in risk score changes that were observed and the significance of each pattern to issuers. (ii) Describe the potential areas of improvement to the HHS-HCC risk adjustment model.

SOA Commentary on Question:

Most candidates struggled with part (i) and oftentimes did not provide a description. Full credit was given if changes were provided along with a complete description and significance of each change. Candidates generally performed well on part (ii).

SOA Answer:

(i)

- The "condition" component (i.e., HCC plus RxC) is an increasing proportion of the total.
  - This makes risk scores more responsive to documented conditions
  - Issuers have been able to increasingly influence their own risk transfers by focusing on 1) medical coding accuracy, 2) member pharmaceutical adherence and 3) EDGE submission practices.
  - It also implies conditions have become a larger predictor of claim costs and, therefore, will be the largest differentiator of risk scores among issuers.
- Composite risk scores have shrunk over time.
  - This suggests that the morbidity of the calibration population is moving closer to the average overall morbidity of ACA markets.
  - This shift affects each issuer to varying degrees, which can present challenges predicting average market-wide risk scores and transfers.

(ii)

- Changing HCC/RxC values and categorizations to leverage the precision of ICD-10 codes
- Refreshing the CSR-induced utilization factors
- Introducing a nonlinear model to the calibration process
- Reflecting additional factors in the transfer calculation, including issuer network characteristics or issuer premium levels, among others
- Incorporating other factors with predictive power, such as social determinants of health and other socioeconomic data (such as credit scores)
- Updating governance procedures to allow either the incorporation of more up-to-date information or more time for issuers to understand a model change
- Enhancing risk adjustment data validation to better align ultimate risk transfers with program goals and/or to minimize disruptive effects
- Incorporating network differences
- Incorporating nonlinearities in model plan liabilities
- Updating risk adjustment factors to include CSR-induced utilization
- China has explored use of a "social credit score," used to track individuals' trustworthiness, though privacy concerns in the United States could present roadblocks to adoption of any similar measure.

Part b:

Source(s): Duncan 14 (Risk) – Risk Adj. - Medicare

Question: Critique the analyst's calculations. Show your work. Justify your response.

SOA Commentary on Question:

Candidates performed well on this part of the question. The most common mistake was not trending for two years.

SOA Answer:

Member A Risk Score: 0.5 age/gender + 0.1 diabetes without complications + 0.7 multiple sclerosis = 1.3

Member B Risk Score: 0.5 Age/gender + 0.0 Diabetes without complications + 0.4 Diabetes with complications + 0.7 Multiple sclerosis = 1.6

Justification: This calculation should use diabetes with complications and should not use diabetes without complications. Weights for condition categories are calculated hierarchically—this means that if a member has a diagnosis of uncomplicated diabetes as well as a diagnosis of diabetes with complications only the weight of the more severe HCC enters the calculation, and the weight of the less-severe HCC is superseded.

Member C Risk Score: 0.7 age/gender = 0.7

Sum the risk scores weighted by months in base year: 1.3*(12/12)+1.6*(12/12)+0.7*(6/12) = 1.3+1.7+0.3 = 3.25

The average risk score is the sum of the risk scores weighted by months in the base year divided by member months in the base period: 3.25/(12/12 + 12/12 + 6/12) = 3.25/2.5 = 1.3

Part C Contract year risk score:

1.30 * 1.011^2 * 1.005^2 * 1/1.03 * .98 = 1.2769

Annual trend/population change should be squared because there are two years between the base and projection, and it is an annual trend.

10. Spring 2023 RM #1

Part a:

Source(s): Duncan 14 (Risk) – Risk Adj. - Medicare
Question: Describe components of the MAPD risk score.

SOA 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.

SOA Answer:

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.

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.

Part b:

Source(s): Duncan 13 (Risk) – Medicaid Risk Adj.; Duncan 14 (Risk) – Risk Adj. - Medicare
Question: Compare and contrast the calculation of MAPD and ERG risk scores.

SOA 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.

SOA Answer:

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 (Heirarchal Condition Codes = HCCs); ERG risk score is based on ERGs assigned as well as age/gender
- 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.

11. Spring 2023 RM #6

Part a:

Source(s): Duncan 21 (Risk) – Risk Adj. ACA Exchanges
Question: Identify and describe issues from the study regarding the use of Medicare Hierarchical Condition Categories (HCCs) for risk adjustment.\

SOA Commentary on Question:
Most candidates identified the issues and included at least one of the discussion points describing the issues.

SOA Answer:

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.

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.

Part b:

Source(s): Duncan 21 (Risk) – Risk Adj. ACA Exchanges
Question: 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

SOA 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.

SOA Answer:

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

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.

Part c:

Source(s): Duncan 21 (Risk) – Risk Adj. ACA Exchanges
Question: 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.

SOA 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.

SOA Answer:

	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

Part d:

Source(s): ASOP #23 – Data Quality

Question: (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.

SOA Commentary on Question:

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

SOA Answer:

(i). 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.

(ii). 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
- 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.

12. Fall 2023 RM #7

Part a:

Source(s): Risk Adj. in State Medicaid Programs

Question: Describe steps for implementing risk adjustment into a Medicaid Managed Care Program.

SOA Commentary on Question:

Candidates needed to not just list but provide an accurate description for each step to earn full credit.

SOA Answer:

1. Decide which risk adjustment system will be used (CDPS, ACG, etc.).
    - The goal of a risk adjustment system in Medicaid managed care is to accurately capture the overall relative risk at the MCO level, not at the individual level. It is important to choose a system based on the data used and the ability to customize the risk adjustment system.
2. Decide what types of data should be used in the risk adjustment system (the plan may be to change this over time).
    - Risk adjustment models should include demographic information (age, gender, and eligibility category).
    - There are three broad categories of additional data that risk adjustment models may use: diagnosis data from inpatient admissions, diagnosis data from outpatient services, and pharmacy data.
3. Decide which Medicaid eligibility groups with be risk-adjusted. In addition, some subpopulations may be excluded (i.e., AIDS and HIV).
    - There are two major considerations in deciding which rate categories to create and whether or not to apply risk adjustment within that rate category: 1) to what degree does health status vary among beneficiaries in the rate category, and 2) will the risk adjustment system appropriately capture health status variations for that category.
4. Decide whether to employ a prospective or concurrent risk adjustment system.
    - Prospective risk adjustment uses experience period data to estimate morbidity for a future period. Concurrent risk adjustment uses experience period data to estimate morbidity during that same time period. Concurrent risk adjustment is more accurate than prospective risk adjustment.
    - Although a concurrent model would do the best job of estimating exactly how much variation in risk exists from one MCO to another, most states have chosen to use a prospective model because retroactive adjustments to rates are not favored by states or MCOs.
5. Decide whether to base the risk adjustment factors on the individuals enrolled during the rating period or during the experience period ("individual" vs. "aggregate" approach).
    - In the individual approach, risk scores for individuals are calculated during the experience period and the risk scores follow beneficiaries through the system. The risk adjustment factor for a given MCO is the weighted average of the risk scores for the beneficiaries enrolled during the rating period.
    - In the aggregate approach, the average risk score for enrollees during the experience period is assumed to represent the average risk of enrollees during the rating period.

- The main advantage of the aggregate approach is that it assigns a claims based risk score to new enrollees.

6. Decide whether or not to customize the risk weights inherent in the risk adjustment model.
   - Customization of risk weights is often necessary for a state Medicaid risk adjustment system based on differences in the state program as compared to the population underlying the development of the risk adjustment system.
7. Decide on criteria for including individuals in the risk adjustment calculations (minimum eligibility during experience or rating period, etc.).
   - Many states require at least six months of eligibility exposure in the experience period to be included in the risk adjustment calculations.
8. Develop criteria for claims records to be included in the risk adjustment model.
   - This step is designed to ensure that the data being used in the risk adjustment calculations is consistent with the rating algorithms and that it is consistent across all comparative organizations.
9. Determine the phase-in schedule and whether or not risk corridors will be used.
   - Typically, adjustments to managed care capitation rates are phased in over time as the risk adjustment process, data, and calculations are refined. The purpose of phase-in and risk corridor provisions is to moderate the impact of the implementation of risk adjustment.

Part b:

Source(s): Duncan 13 (Risk) – Medicaid Risk Adj.
Question: Calculate the total average risk score for XYZ Insurance Company. Show your work.

SOA Commentary on Question:

Most candidates performed well on this part of the question.

SOA Answer:

Relative Condition Factor (Long Cohort) = (Long Cohort Condition (ERG) Factor) ÷ (Long Cohort Age/Gender Factor) = 0.3680 ÷ 0.3810 = 0.9659

Imputed Condition Factor (Short Cohort) = Relative Condition Factor (Long Cohort) × Short Cohort Age/Gender Factor = 0.9659 × 0.3702 = 0.3576

Weighted Condition Factor (Short Cohort) = (50% × Imputed Condition Factor (Short Cohort)) + (50% × Short Cohort Age/Gender Factor) = (50% × 0.3576 + 50% × 0.3702) = 0.3639

Total Average Risk Score = (Long Cohort Weight × Long Cohort (ERG) Factor) + (Short Cohort Weight × Weighted Condition Factor (Short Cohort)) = (0.86 × 0.3680) + (0.14 × 0.3639) = 0.3674

Part c:

Source(s): Duncan 13 (Risk) – Medicaid Risk Adj.
Question: Calculate the risk adjusted capitation rates for XYZ Insurance Company. Show your work.

SOA Commentary on Question:

Candidates received credit for calculating the risk adjusted capitation rate by either adjusting the premium tax for the risk score or applying the premium tax as a percentage, although the latter would be the preferred method.

SOA Answer:

See the accompanying Excel file for the full solution

13. Spring 2024 RM #5a-b

SOA Commentary on Question:

The sections of this question tested the candidate's knowledge of key market stabilization forces in the ACA, the design elements of the ACA's HHS-HCC Risk Adjustment Model, and the actuary's obligations under ASOP 41. Candidates who received full points were able to identify and summarize the relevant portions of the source material.

Part a:

Source(s): Creating Stability in Unstable Times

Question: (i) Describe the following aspects of the Affordable Care Act: Individual Mandate, Subsidies, Risk Corridors, Reinsurance (ii) Critique the effectiveness of each aspect in creating a stable and sustainable market.

SOA Commentary on Question:

Candidates generally did well on this part of the question and were able to capture the main elements of each aspect. While candidates did not need to exhaustively cover all the bullets below to receive full points, only a subset of candidates identified enough salient elements, particularly for subsidies and risk corridors, to receive full points.

SOA Answer:

(i) Descriptions

Individual Mandate

• The individual mandate is a tax penalty on individuals able to afford coverage but choose not to purchase it.
• The mandate produces financial incentives for healthy individuals to purchase coverage to improve the risk pool.

Subsidies

• Advanced premium tax credits (APTCs) are calculated relative to the second lowest cost silver plan in an enrollee's area and reduce premiums substantially.
• By tying the subsidy amounts to the premium levels, eligible enrollees are protected from large increases in premiums.
• Subsidy amounts decrease as enrollee incomes increase and subsidies completely end above 400 percent of the federal poverty level (FPL).
• The subsidy structure has produced large increases in enrollment.

Risk Corridors

• The risk corridor program was a transitional program intended to protect issuers from large losses in the first three years of the ACA.
• It was expected that it would be difficult to estimate the costs of the new population since it would be much different from what had existed previously.
• Premiums may have been lower than they would have been because issuers expected this program to protect them from insufficient rates.

Reinsurance

• The reinsurance program covered a portion of large claims reducing the risk to issuers and lowering premium.
• It was successful at lowering premiums.
• Many states are now considering state-based programs.

(ii) Critiques

Individual Mandate
• There has been some concern that the financial penalties of the mandate are not large enough.
• The current political environment has produced uncertainty regarding the enforcement of the mandate
• Less enforcement of the mandate could increase risk selection.

Subsidies
• Enrollees without subsidies have felt the full impact of the recent large premium increases.
• The subsidy structure may need to be altered to encourage younger individuals to enroll since older enrollees are more likely to be eligible for subsidies.

Risk Corridors
• The risk corridor program paid out only a tiny fraction of the amount of calculated risk corridor payments.
• Insufficient risk corridor payments were likely a key factor in market instability and the wave of co-op plans becoming insolvent.

Reinsurance
• It was phased out over three years causing higher premium increases.

Part b:

Source(s): ASOP #41 – Act. Communications
Question: Describe disclosure requirements of ASOP 41 for the use of assumptions and methods (i) prescribed by law. (ii) relied on from another party.

SOA Commentary on Question:
Candidates who were familiar with ASOP 41 were able to reproduce the necessary sections of the ASOP and receive full points, however, some candidates referenced incorrect sections of the ASOP in their responses.

SOA Answer:
(i) Prescribed by law

• the applicable law under which the report was prepared;
• the assumptions or methods that are prescribed by the applicable law; and
• that the report was prepared in accordance with the applicable law.
• If the actuarial report is in a prescribed form that does not accommodate these disclosures, the actuary should make these disclosures in a separate communication.

(ii) Reliance on another party

• the assumption or method that was set by another party;
• the party who set the assumption or method;
• the reason that this party, rather than the actuary, has set the assumption or method;
• If the assumption or method does not conflict significantly with what, in the actuary's professional judgment, would be reasonable for the purpose of the assignment, the actuary has no further disclosure obligation
• If the assumption or method significantly conflicts with what, in the actuary's professional judgment, would be reasonable for the purpose of the assignment, the actuary must disclose that fact
• If the actuary has been unable to judge the reasonableness of the assumption or method without performing a substantial amount of additional work beyond the scope of the assignment, or
• Or if the actuary not qualified to judge the reasonableness of the assumption.
• If the actuarial report is in a prescribed form that does not accommodate these disclosures, the actuary should make these disclosures in a separate communication.
• If the actuary believes circumstances are such that including certain content is not necessary or appropriate, the actuary must be prepared to identify such circumstances and justify limiting the content of the actuarial report.

14. Fall 2024 RM #5

SOA Commentary on Question:

This question was testing candidates' knowledge of ACA risk adjustment and how to calculate transfers.

Part a:

Source(s): Restoring the Indifference Ideal
Question: Describe the intention, aim, and design of risk adjustment as it pertains to the ACA marketplace.

SOA Commentary on Question:

Most candidates had a general knowledge of risk adjustment and received at least partial credit on this part of the question.

SOA Answer:

- The aim of ACA risk adjustment is to foster markets where health plans compete on quality, efficiency, and value, not on risk selection
- A rating gap exists between the premium rates offered under the current market regulatory environment and the premium rates that would have been offered in an environment without regulations limiting rating factors
- 'Risk adjustment' is designed to bridge the rating gap
- Risk adjustment is needed as health plans are not permitted to develop rating factors that properly reflect risk

Part b:

Source(s): Restoring the Indifference Ideal
Question: (i) Describe the "indifference ideal." (ii) Describe how the "indifference ideal" is supported by ACA risk adjustment.

SOA Commentary on Question:

Most candidates demonstrated some knowledge of this concept.

SOA Answer:

- Differences in rates reflect differences in cost
- Health plans are indifferent to enrollment mix if rating factors are developed to promote actuarial equity and level profitability across various demographic characteristics and products
- also characterized as insurers being "ambivalent" to any characteristics
- Federal government assumes responsibility for the development of rating factors
- The ACA risk adjustment methodology needs to be developed with both a detailed understanding of risk characteristics and a technical comprehension of how the ACA regulatory limitations on premium rates reflect these risk characteristics.
- Paradigm shift: In the ACA world, health plans are not permitted to develop rating factors that properly reflect risk.
- Risk adjustment addresses the rating gap due to regulations OR "bridge the gap"
- Risk adjustment fosters "indifference ideal" or reinforces rating rules

Part c:

Source(s): Restoring the Indifference Ideal

Question: Calculate the allowed premiums and equitable risk transfer payments and receipts for Insurer A and Insurer B under each of the following scenarios. Show your work.(i) Without age rating. (ii) With age rating and premiums three times higher for Older Adults than Young Adults.

SOA Commentary on Question:

Some candidates did well on part i) but couldn't apply correct age rating in part ii).

SOA Answer:

The model solution for this part of the question is in the Excel spreadsheet.

Part d:

Source(s): Restoring the Indifference Ideal

Question: Describe reasons why ACA metal level premium relationships are disparate across the country.

SOA Commentary on Question:

Other than Cost Share Reduction (CSR), most candidates struggled on this part.

SOA Answer:

- Federal guidance is not uniformly enforced.
- Deference to states with "effective rate review" processes.
- Rating dynamics associated with AV are technical and paradoxical, the comprehensiveness & rigor of state's review processes vary in detail & in nature.
- Some states have specifically addressed premium alignment issues through formal rulemaking.
  - Example states: Colorado, Texas, New Mexico, Pennsylvania, Virginia
- Different distribution of silver enrollees in CSR defunded environment.

Part e:

Source(s): Restoring the Indifference Ideal

Question: List differences between the ideal ACA environment and the alternative environment.

SOA Commentary on Question:

Most candidates received partial credit on this part of the question, but few provided enough detail to receive full credit.

SOA Answer:

Ideal ACA environment:

- ACA rating rules are enforced
- The risk adjustment methodology reinforces the ACA rating rules
- Health plans are generally indifferent to the populations they enroll
- Risk adjustment appropriately adjusts for risk
- Consumer equity

Alternate environment:

- The ACA risk adjustment methodology is effectively not risk adjustment.
- The ACA risk adjustment methodology is merely a complicated financial mechanism that feeds actuarial rating formulas.
- Health plans compete for targeted populations without regard for the indifference ideal.
- Result is lower premium subsidies.

15. Fall 2021 SPC #4c-d

Part c:

Source(s): ASOP #41 – Act. Communications

Question: (i) Define "reliance on other sources," according to ASOP 41. (ii) Describe disclosure requirements when relying on other sources of data and other information in the Actuarial Report, according to ASOP 41.

SOA Commentary on Question:

It is important for the candidate to understand that the actuary is responsible for everything in the Actuarial Report, including all data and assumptions, unless disclosing reliance on others. Some candidates confused part ii) with the question in part d.

SOA Answer:

(i)

- Reliance on other sources for data and other information means making use of those sources without assuming responsibility for them.

(ii)

- An actuary is responsible for all of the actuarial communication unless the actuary states reliance on other sources.
- Define the extent of reliance, for example stating whether or not checks as to reasonableness have been applied.
- Consult ASOP No.23, Data Quality, for further guidance on reliance.

Part d:

Source(s): ASOP #41 – Act. Communications

Question: Describe the responsibility of the actuary in disclosing assumptions and methods in the Actuarial Report, according to ASOP 41.

SOA Commentary on Question:

Many candidates received partial or full credit for this part of the question. Some candidates listed all the requirements for the Actuarial Report instead of those specific only to disclosures on assumptions and methods.

SOA Answer:

- Identify the party responsible for each material assumption and method
- If no party is identified as responsible, the actuary who issued the communication is assumed to have taken responsibility for that assumption or method.
- Where any material assumption or method was prescribed by applicable law (statutes, regulations, and other legally binding authority), disclose:"
    - The applicable law under which the report was prepared.
    - The assumptions or methods that are prescribed by the applicable law.
    - That the report was prepared in accordance with the applicable law.
    - If the actuarial report is in a prescribed form that does not accommodate these disclosures, the actuary should make these disclosures in a separate communication.

- If any material assumption was not proscribed by law (statutes, regulations, and other legally binding authority) where the actuary states reliance on other sources the actuary should disclose:
    - the assumption or method that was set by another party.
    - the party who set the assumption or method.
    - the reason that this party has set the assumption or method.

- If the actuary feels the assumption or method significantly conflicts with what the actuary feels is reasonable based on his/her actuarial judgement, this must be disclosed.
- If the actuary was unable to judge the reasonableness of the assumption or method without substantial amount of additional work beyond the scope of the assignment, this must be disclosed.
- If the actuary was not qualified to judge the reasonableness of the assumption.