GH 301 Sample Detailed Study Manual

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Each portion of the detailed study manual is available in PDF with a clickable table of contents for ease of navigation in your favorite desktop, tablet, or smartphone PDF viewer.

Though not shown in the sample material, we also offer condensed versions of the detailed study manual and PDF handouts for all video lessons.

If you have additional questions about the detailed study manual or any aspect of the exam, please email me.

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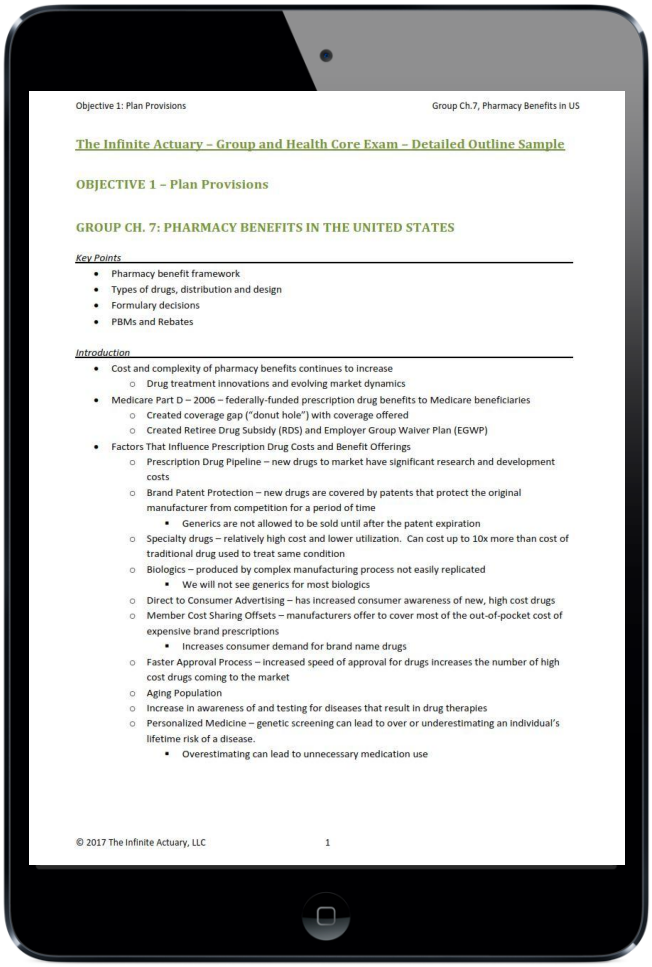

Objective 1: Plan Provisions — Group Ch.7, Pharmacy Benefits in US

The Infinite Actuary – Group and Health Core Exam – Detailed Outline Sample

OBJECTIVE 1 – Plan Provisions

GROUP CH. 7: PHARMACY BENEFITS IN THE UNITED STATES

Key Points

- Pharmacy benefit framework
- Types of drugs, distribution and design
- Formulary decisions
- PBMs and Rebates

Introduction

- Cost and complexity of pharmacy benefits continues to increase
  - Drug treatment innovations and evolving market dynamics
- Medicare Part D – 2006 – federally-funded prescription drug benefits to Medicare beneficiaries
  - Created coverage gap ("donut hole") with coverage offered
  - Created Retiree Drug Subsidy (RDS) and Employer Group Waiver Plan (EGWP)
- Factors That Influence Prescription Drug Costs and Benefit Offerings
  - Prescription Drug Pipeline – new drugs to market have significant research and development costs
  - Brand Patent Protection – new drugs are covered by patents that protect the original manufacturer from competition for a period of time
    - Generics are not allowed to be sold until after the patent expiration
  - Specialty drugs – relatively high cost and lower utilization. Can cost up to 10x more than cost of traditional drug used to treat same condition
  - Biologics – produced by complex manufacturing process not easily replicated
    - We will not see generics for most biologics
  - Direct to Consumer Advertising – has increased consumer awareness of new, high cost drugs
  - Member Cost Sharing Offsets – manufacturers offer to cover most of the out-of-pocket cost of expensive brand prescriptions
    - Increases consumer demand for brand name drugs
  - Faster Approval Process – increased speed of approval for drugs increases the number of high cost drugs coming to the market
  - Aging Population
  - Increase in awareness of and testing for diseases that result in drug therapies
  - Personalized Medicine – genetic screening can lead to over or underestimating an individual's lifetime risk of a disease.
    - Overestimating can lead to unnecessary medication use

HEALTHCARE RISK ADJUSTMENT AND PREDICTIVE MODELING, DUNCAN CH. 21 – RISK ADJUSTMENT ON THE ACA EXCHANGES

Affordable Care Act and State Exchanges

- ACA signed in 2010, effective as of 2014
  - Enacted to increase quality and affordability of health insurance, lower uninsured rate, and reduce costs for individuals and the government
  - Individual mandate for insurance and subsidies used to achieve coverage goals
  - Considerably modeled after 2007 health insurance reform in Massachusetts
- ACA requirements
  - Federal mandates for covered services, must cover all applicants, and must offer same rates regardless of pre-existing conditions or sex
- ACA requirements depart from accepted actuarial practice
  - Group insurance usually doesn't require underwriting because of large size
  - Individual insurance usually self paid without subsidies
    - Results in anti-selection, hence the need for strict underwriting
  - ACA addresses this problem with risk-adjusted revenue transfers
- ACA Attempts to Overcome Anti-Selection and Instability Problems
  - 1. Subsidies for applicants with limited income (usually under $24,000 per year)
  - 2. Mandates provision of insurance by employers and purchase of insurance by all residents ineligible for employer coverage, with penalty for non-purchase of insurance
  - 3. Risk adjustment to transfer revenue from plans with low-risk populations to plans with high-risk populations
- For ACA to work as intended, plans must attract young, healthy people to subsidize the older, sicker populations
- Risk adjustment takes revenue from plans with younger, healthier lives, so plans anticipating having to pay risk adjustments must inflate their premiums to capture sufficient revenue
  - Higher premiums then results in lower enrollment of this younger group
  - Plans with young age/sex groups that are profitable pre-transfer may be unprofitable post-transfer
  - Plans expecting to receive subsidy can set premiums at lower level
    - These plans may attract members due to reasons other than premium level, such as good networks or other considerations, so the subsidy creates an unintended gain
- Enrollment in ACA exchanges is skewed more towards older population

History and Operation of Exchanges

- Exchanges are regulated, online marketplaces where individuals and small businesses can buy private insurance plans
  - Administered by federal or state governments
    - Most states use federal or hybrid federal-state platform
  - Opened Oct. 1, 2013 for Jan. 1, 2014 coverage
  - Subsidies for individuals with income between 100%-400% of Federal Poverty Level

- Exchanges allow plans to be compared and sold
- Risk mitigation in ACA (similar to Massachusetts model)
    - Reinsurance (temporary), risk corridors (temporary) and risk adjustment (permanent)

Risk Adjustment in Exchanges

- Insurers will be held harmless (to some degree) for the risk selection resulting from members choosing different plans – this is where risk adjusted reimbursement comes in
    - Risk adjustment used in Massachusetts example, Medicare Advantage, Medicare Part D and Medicaid
- Payment adjustments sum to zero
    - Lower risk plans pay into reimbursement scheme and higher risk plans are reimbursed from that money
    - Medicare and Massachusetts plan don't sum to zero – overall increase in risk leads to higher overall reimbursement
- Risk adjustment – aims to reduce incentive for insurers to avoid enrolling individuals with potentially higher costs
    - Revenue neutral within a state
    - Transfers done separately for individual and small group markets
    - Calculations performed separately for each "metal level"
    - Adjustment occurs for plans in exchanges and outside exchanges
- HHS-HCC model used for risk-adjustment (with revisions for population covered)
    - (Not the same as CMS-HCC model used for Medicare)
    - Demographics and diagnoses generate risk score
- ACA model accommodates different benefit designs with different actuarial values
    - Unlike other risk adjustments that don't have to deal with different benefits/levels
    - Silver plan (70% actuarial value) is used as reference plan
    - No longer a single base premium for entire pool
        - Risk adjustment must recognize and maintain benefit level differences in premium
    - Induced demand – member cost sharing affects differences in utilization
        - Risk adjustment includes provision for induced demand

Rating Factors and Methodology

- Allowable Rating Factors Under ACA
    - Age (3:1 max ratio)
    - Location
    - Family Size
    - Tobacco use (1.5:1 max ratio)
        - Note – tobacco usage is rarely used in practice due to administrative hassle
- ACA model uses concurrent (retrospective) risk score calculation
- Medicare (and Massachusetts) models use prospective risk score calculation
- Reasons ACA Used Concurrent Model
    - 1. First year of ACA didn't have historical data to use for a prospective calculation (Note – Massachusetts used demographic only factors for the first years to overcome this)
    - 2. Prospective models are less accurate than concurrent models (based on SOA study)

- 3. Churn rates of members through exchanges means that many plans wouldn't have claims data on members
  - *[This was not an original consideration but something realized after the fact]*
- ACA uses different models for sub-populations (infants 0-1, children 2-20, adults 21+

Revenue Transfer Process

- Transfer looks at difference between Premium with Risk Selection minus Premium Without Risk Selection
  - Positive difference – plan receives payment; Negative difference – plan owes payment
- Risk Transfer Formula

$$T_i = \left[\frac{PLRS_i * IDF_i * GCF_i}{\sum(s_i * PLRS_i * IDF_i * GCF_i)} - \frac{AV_i * ARF_i * IDF_i * GCF_i}{\sum(s_i * AV_i * ARF_i * IDF_i * GCF_i)} \right] x \; P_s$$

(Premium with Risk Selection – Premium without Risk Selection)

  - T_i = transfer amount
  - P_s = *[statewide enrollment-weighted]* market average premium
  - s_i = plan enrollment market shares
  - Numerator of the first term:
    - Plan liability risk score (PLRS) – plan's actuarial value, as well as the plan's enrollee health status risk
    - Induced demand factor (IDF) – anticipated induced demand associated with the plan's cost sharing level
    - Geographic cost factor (GCF) – medical cost structure in the geographic location of the plan's enrollees
  - Numerator of the second term:
    - Actuarial value (AV) – associated with plan's metal level
    - Plan's allowable rating factor (ARF) – relative premium plans are permitted to charge given the allowable rating factors of its enrollees
    - Induced demand factor (IDF) – associated with the plan's metal level
    - Geographic cost factor (GCF) – of plan's enrollees
- Example 1 – Medicare vs ACA
  - E.g. 2 plans with equal enrollment; Avg Risk Score Plan A = 1.2; Avg Risk Score Plan B = 0.8; Market Avg Risk Score = 1.0; Market Avg Premium = $500
  - Medicare Risk Adjusted Premiums
    - Plan A: 500 x 1.2 = $600
    - Plan B: 500 x 0.8 = $400
    - Total Premium: = $1,000 (and avg premium = $500)
    - CMS would reimburse Plan A $100 per member in excess of market premium (and Plan B $100 less)
  - ACA Risk Adjustment
    - Assume Plan A actuarial value = 0.72; Plan B actuarial value = 0.68 (both are Silver plans)
    - Plan A PLRS = 1.2; Plan B PLRS = 0.8
    - All other variables assumed to be 0

- Plan A Transfer
- $T_i = [\frac{1.2 \; x \; 1 \; x \; 1}{0.5 \; x \; (1.2 \; x \; 1 \; x \; 1) + 0.5 \; x \; (0.8 \; x \; 1 \; x \; 1)} - \frac{0.72 \; x \; 1 \; x \; 1 \; x \; 1}{0.5 \; x \; (0.72 \; x \; 1 \; x \; 1) + 0.5 \; x \; (0.68 \; x \; 1 \; x \; 1)}] \; x \; 500$
- $T_i = [\frac{1.2}{1.0} - \frac{0.72}{0.7}] \; x \; 500 = 85.71$

- Plan B Transfer
- $T_i = [\frac{0.8 \; x \; 1 \; x \; 1}{0.5 \; x \; (1.2 \; x \; 1 \; x \; 1) + 0.5 \; x \; (0.8 \; x \; 1 \; x \; 1)} - \frac{0.68 \; x \; 1 \; x \; 1 \; x \; 1}{0.5 \; x \; (0.72 \; x \; 1 \; x \; 1) + 0.5 \; x \; (0.68 \; x \; 1 \; x \; 1)}] \; x \; 500$
- $T_i = [\frac{0.8}{1} - \frac{0.68}{0.7}] \; x \; 500 = -85.71$

- Note that amount transferred from Plan B to Plan A is $85.71 in ACA example and $100 in Medicare example
  - Difference is that actuarial value/benefit plan design is factored into calculation

Underlying Theory of Risk Adjustment

- Risk transfer – base hypothesis is that risk and cost are correlated
- Assume linear relationship with risk score and cost (imagine Risk Score on x-axis and Cost on y-axis)
- Example 2
  - A and B have Silver plans (0.7 AV); Relative risk scores are 0.918 and 1.082, respectively; Overall state risk score is 1.0; Induced demand of 2% (factor is 1.02); Rating Factor is 1.952; Geographic Factor = 1.0; Avg Premium = $489.82
  - $T_i = [\frac{0.918 \; x \; 1.02 \; x \; 1}{0.5 \; x \; (.918 \; x \; 1.02 \; x \; 1) + 0.5 \; x \; (1.082 \; x \; 1.02 \; x \; 1)} - \frac{0.7 \; x \; 1.952 \; x \; 1.02 \; x \; 1}{0.5 \; x \; (0.7 \; x \; 1.952 \; x \; 1.02 \; x \; 1) + 0.5 \; x \; (0.7 \; x \; 1.952 \; x \; 1.02 \; x \; 1)}] \; x \; 489.82$
  - $= [\frac{0.93636}{1.02} - \frac{1.393728}{1.393728}] \; x \; 489.82 = -40.17$

Plan Financials	State	Plan A After Transfer	Plan B After Transfer
Members	2,000	1,000	1,000
State Total Claims	$11,755,680	$5,877,840	$5,877,840
Relative Cost		0.918	1.082
State Total Claims x Relative Cost	$11,755,680	$5,395,857	$6,359,823
Gain (Loss)		**$481,983**	**($481,983)**
Funds Transfer		**($481,983)**	**$481,983**
Net Income		**$0**	**$0**
As % of Premium		0.0%	0.0%

  - In this scenario, gains and losses are offset by the transfer, resulting in net zero balance for each plan

A Problem with Non-Linear Cost Relationships

- What if relationship between risk score and cost in non-linear?
  - *[See graph in video/handouts]*

- Example 3
  - Same info as Example 2, but plans have Relative Costs of 0.929 and 1.071
  - Revenue transfer amount of $40.17 PMPM is the same
  - Financials are different

Plan Financials	State	Plan A After Transfer	Plan B After Transfer
Members	2,000	1,000	1,000
State Total Claims	$11,755,680	$5,877,840	$5,877,840
Relative Cost		0.929	1.071
State Total Claims x Relative Cost	$11,755,680	$5,460,513	$6,295,167
Gain (Loss)		**$417,327**	**($417,327)**
Funds Transfer		**($481,983)**	**$481,983**
Net Income		**($64,656)**	**$64,656**
As % of Premium		-1.1%	1.1%

  - In this scenario, non-linearity in relationships results in higher-than-expected claims for A and lower-than-expected for B
    - Risk adjusted transfer exceeds the higher claims in B

Empirical Analysis of Cost-Risk Relationship

- Commercial employer dataset example shows risk score and cost being linearly-related
  - Graph of model residuals shows that this area could benefit from further research
  - Appears to be evidence on non-linearity around risk score of 1.0
  - Non-linear relationship also shows up in samples of Medicare data
    - In Medicare data, deviation from linear relationship occurs at higher risk scores
- *[Detailed graphs are available in the source text to illustrate the information above]*

Some Other Practical Risk Adjustment Issues

- Risk adjustment has given rise to issues since entering widespread use in 1990s

Medicare HCCs

- Medicare Payment Advisory Commission (MedPAC) published study that says HCC-based risk adjustment more accurately reflects patient risk than prior system but still has issues
- Issues in Medicare HCCs
  - 1. Only use 70 HCCs for risk scoring (though CMS-HCC maps 189 HCCs)
    - Only 24% of ICD-9 and 11% of ICD-10 codes are mapped
    - Inclusion of certain specific conditions could help improve predictive accuracy of model
  - 2. Considerable variation within HCCs of patient severity and experience
    - Grouper models have to aggregate a range of severities and costs, so on average, the estimate is ok, but likely inaccurate on individual level
  - 3. Certain racial groups and income levels likely to be higher consumers of healthcare
    - Report examined and found little effect to adding race and income variables
    - SOA study by Mehmud found “non-traditional” variable with effects on loss ratios across five classes: demographic, economic, lifestyle, psychological outlook and physical outlook

- 4. Observation of conditions over period of 2 years
  - Recommends using 2 years of diagnosis data (though may be impractical) to capture better information on condition, treatment and claims
- 5. Number of conditions
  - Simple observation and inclusion of number of conditions in patient's record is predictive of higher risk
  - Addition of this variable would appear to be beneficial to model

Issues in ACA Risk Adjustment

- Adjustment under ACA not as successful as under Medicare Advantage
  - Exchanges and risk adjustment both implemented with "big bang" in October 2013 and "go live" in January 2014
  - Massachusetts used risk adjustment model developed by Milliman
  - Federally, states used version of HCC, calibrated for exchanges
- Massachusetts
  - Experience has been somewhat controversial, with carriers challenging calculations and revenue transfers
  - Issues with Massachusetts Risk Adjustment
    - 1. Applies to gross premium, not cost of insurance or pure premium
      - Transfers part of expense margin, in addition to excess claims
    - 2. Bias against zero-condition members
      - Zero condition – patient may be too new for health plan to have claims or may have a condition that is not part of HCC mapping
      - Counterintuitive result – loss ratios begin high, then decline with age
      - Usually, younger members should be a profitable cohort
    - 3. Bias against limited network and other lower cost plans
      - Limited networks tend to be lower cost, allowing them to charge lower premiums
      - Sicker people less likely to choose these plans
      - Example 4
        - Similar to Example 2, but Plan A is a low-cost plan with premium of 90% of state average, and Plan B is high-cost with premium of 110% of state average
        - Plan A premium = $489.82 x .9 = $440.84
        - Plan B premium = $489.82 x 1.1 = $538.80
        - Transfer amounts the same, but financials change

Plan Financials	State	Plan A After Transfer	Plan B After Transfer
Members	2,000	1,000	1,000
Premiums	$11,755,680	$5,290,056	$6,465,624
Relative Cost		0.918	1.082
Claims (489.82 x Relative Cost x Network)	$11,852,077	$4,856,271	$6,995,805
Gain (Loss)	**($96,397)**	**$433,785**	**($530,181)**
Funds Transfer		**($481,983)**	**$481,983**

Net Income	**($96,397)**	**($48,198)**	**($48,198)**
As % of Premium		-0.9%	-0.7%

        - 4. Risk adjustment operates on state level (rather than regional)
            - Wide variations exist in networks, costs and utilization in different areas of the state

- National
    - In 2014 and 2015, risk adjustment transfers were 5.6-5.9% of premium for small group and 9.5-9.9% of premium for individual markets, for a total of $4.6 Billion for 2014 and $7.8 Billion for 2015
        - Transfers in individual market were larger percentage than in small group market
    - Potential Sources of Bias in Risk Adjustment Transfers
        - 1. Partial Year Enrollment
            - Two issues – 1. New entrants during the year have fewer months to accumulate diagnoses and therefore have lower risk scores and 2. Same population may have an acute episode in a short period of time
            - If plan has disproportionately more partial year members, they will have larger risk transfers than the corresponding decrease in claims
            - Risk for adults with short enrollment periods was under-predicted by the risk adjustment model
        - 2. Lack of Historical Data
            - Few members would have enough data for carriers to use 2 years of data, since many members churn/change plans
            - Risk score based only on medical claims
                - Pharmacy data could be used in addition
                    - Pharmacy data lacks diagnosis code, so that would need to be imputed
        - 3. Only a Fraction of Members Trigger Conditions
            - 19% of adults, 9% of children and 45% of infants are identified as having one of the flagged conditions
        - 4. High-Cost Cases
            - Risk scores don't track costs well at extremes of risk-cost distribution
            - High risk members may have costs disproportionate to their risk score
            - Out-of-network coverage also causes deviation
            - Supplemental risk adjustment model with a threshold amount for high cost cases to be excluded could be applied
        - 5. Prospective vs. Concurrent Models
            - Prospective model – Medicare Advantage, Part D, Massachusetts
            - May be a possibility now for ACA, since prior data exists
            - CMS rejected prospective model:
                - A. Predictive accuracy better with concurrent model (according to SOA study)
                - B. Data wouldn't be consistently available due to churn of members

- 6. Market-Share
    - Issues may be specific to start-up, co-op and small insurers
        - At a disadvantage because of limited or no market presence
    - Market share is an adjustment factor in risk transfer
        - Small insurers may have premiums significantly different than state average, so revenue transfers won't bear a strong relationship with their own actual premiums
    - Larger market share means own experience will affect the market more and there will be less likelihood for revenue transfer

Conclusion

- CMS announced changes for ACA risk adjustment model
    - 2017 year – include adjustment for partial-year enrollees
    - 2018 year – prescription drug utilization data incorporated
- CMS' reaction may be too little, too late for some