

Healthcare Accountable Care Organization Shared-Savings



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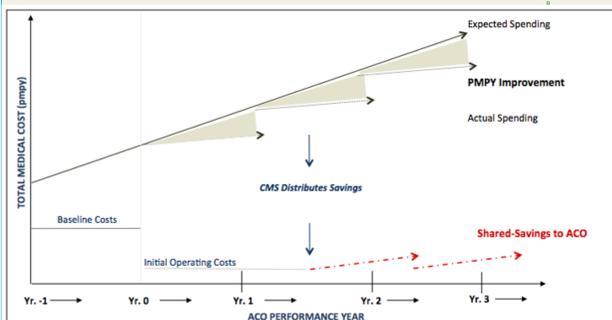


Abstract

The goal of this project was to replicate the Medicare Accountable Care Organization (ACO) shared savings calculation to find out how sensitive the savings rate can be depending on multiple scenarios. This calculation was reproduced using the data of ten thousand patients, which was extracted from the Medicare five percent file. After creating a baseline savings rate using the data we had, we modeled six other scenarios. Each scenario gave us more insight into how responsive savings can be depending on the factors presented. One major conclusion that we came through in this project was that savings are highly leveraged.

Introduction

- ❖ Background
 - The **Medicare Shared Savings Program** was established by section 3022 of the Affordable Care Act. The Congress created this program to better coordinate among providers to ensure quality care for Medicare Fee-For Service beneficiaries and reduce unnecessary costs.
 - ACOs stands for **Accountable Care Organizations**. They are groups of doctors, hospitals, and other health care providers who came together voluntarily to give coordinated high quality care to their Medicare patients. The shared savings program is only opened for eligible ACOs.
- ❖ Data Processing
 - Extract claim amounts from Claim dataset and sum them for each individual beneficiary
 - Map ICD-9 Diagnosis codes to HCC (Hierarchical Condition Categories) codes to generate risk scores.
- ❖ The Algorithm
 - **The Shared Savings Calculation** requires estimates of benchmark costs, average risk scores for benchmark year and performance year, rebasement on the benchmark, performance year costs and national increase in per capita expenses.



Data

- ❖ Extracted from the **Medicare five percent file** with around 10,000 lives
- ❖ Five different files (in spreadsheets):
 - Inpatient Claims
 - Outpatient Claims
 - Hospice Claims
 - Medicare Part B (physician) Claims
 - Skilled nursing facility (SNF) Claims
- ❖ Each patient's diagnosis codes (ICD9's) were mapped into Hierarchical Condition Categories (HCC's)

HCC Risk Adjustment

- ❖ Essentially, individual's risk score is the **sum of weights that reflects the health risk** posed by different diagnoses. (Duncan 2011).
- ❖ Total Risk Score = Demographic (Age & Gender) Score + Health Condition Score (HCCs)
- ❖ Since we have 2012 and 2013 as our Benchmark Years, we use the 2012 CMS-HCC risk adjustment model
- ❖ Example of calculating risk score for one individual:

Demographic Factor	Female, Age 62	0.416 (Female 60-64)
Health Condition Factor 1	HIV	0.492 (HCC 1)
Health Condition Factor 2	Diabetes without Complications	0.124 (HCC 19)
Disease Interactions	None	0
Total Risk Score		1.032

(This patient is expected to have costs 1.032 times the average medicare patient)

Alternate GLM Risk Adjustment

- ❖ In this study, we also used the GLM cost predicting model from the Medicare Predictive Modeling project (PSTAT 296)
- ❖ The purpose is testing the changes in saving due to an alternative risk adjustment model
- ❖ Method of Generating risk scores
 - Step 1: Run the GLM model on the whole 5% dataset (with help of Santa Barbara Actuaries Inc.)
 - Step 2: Run the GLM model on our segment of the dataset
 - Step 3: Simulated Risk Score:

Risk Score =

Projected Cost for an Individual
Average Projected Cost

- ❖ This simulated risk scores were used in scenario 5 and shown in Table 2

Methodology

Shared Saving Calculation:

In order to calculate the final saving, we need :

- 1) **Historical Benchmark** year expenditure
- 2) **Updated Historical Benchmark** year expenditure:

Takes account of performance year information, used to compare with the ACO's actual expenditure during the performance year to determine savings

- Step 1: Determine number of assigned beneficiaries and per capita expenditure in each Benchmark Year
- Step 2: Calculate average risk score of beneficiaries in each Benchmark Year and risk ratio between them
- Step 3: Adjust Benchmark Year expenditure using national expenditure trend factor and risk ratio
- Step 4: Calculate weighted average benchmark expenditure
- Step 5: Calculate average risk score and expenditure for Performance Year
- Step 6: Update benchmark expenditure with risk ratio and national Fee-For-Service Growth increment from latest Benchmark to Performance Year, in dollar amount
- Step 7: Determine number of beneficiaries in Performance Year
- Step 8: Compare actual total expenditure and total

benchmark expenditure in Performance Year to determine whether ACO could have gains based on the Minimum Savings Rate
Step 9: Calculate final sharing rate based on service quality score and sharing method

Results

Risk Score	HCC: Risk scores from CMS-HCC Risk Adjustment Model	GLM: Risk scores generated from Medicare Predictive Modeling Group's GLM
Trend	Fixed: Fixed national fee for service growth increment	Percentage: Percentage national fee for service growth increment
Benchmark Weight	% weight of benchmark year one/% weight of benchmark year two	
Cost PMPY	% increase/decrease in Benchmark cost per member per year	

Scenario s	Descriptions	Saving as % of Cost
Baseline	HCC Model, Fixed Trend Adjustment, Benchmark weight 30/70, Average benchmark cost \$9,338	9.90%
1	Baseline with modification of 10% Benchmark Cost increase	13.41%
2	Baseline with modification of 10% Benchmark Cost decrease	4.45%
3	Baseline with modification of 50/50 Benchmark weight	9.70%
4	Baseline with modification of percentage Trend adjustment	9.95%
5	Baseline with modification of GLM Model	8.22%
6	Baseline with modification of 0/100 benchmark year weight	10.91%

Conclusions

- ❖ Savings are **very highly leveraged**
 - If costs go down by a certain percentage then savings go down by an even bigger percentage
- ❖ Changing from a fixed trend factor to a percentage trend factor has a very small impact on overall savings
- ❖ Changing the Benchmark weights has a small effect on overall savings
- ❖ The GLM model results led us to the conclusion that the CMS might want to re-adjust their model since we attained a better savings rate with the GLM.

References

- ❖ Duncan, Ian G. *Healthcare Risk Adjustment and Predictive Modeling*. ACTEX Publications, 2011. Print.
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