

**2018 HEALTH**  
MEETING  
JUNE 25-27 • AUSTIN, TX



## **Session 72L, Learning from 3 Years of ACA Data**

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Society of Actuaries - Session 72

# Learning From 3 Years of ACA Data

June 26, 2018

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# Learning From 3 Years of ACA Data

## Agenda

- Background, data, methodology
- Lessons learned from 2014-2016 ACA Data
- Factors shaping future ACA Results
- Q&A

# Background: Data to Insight

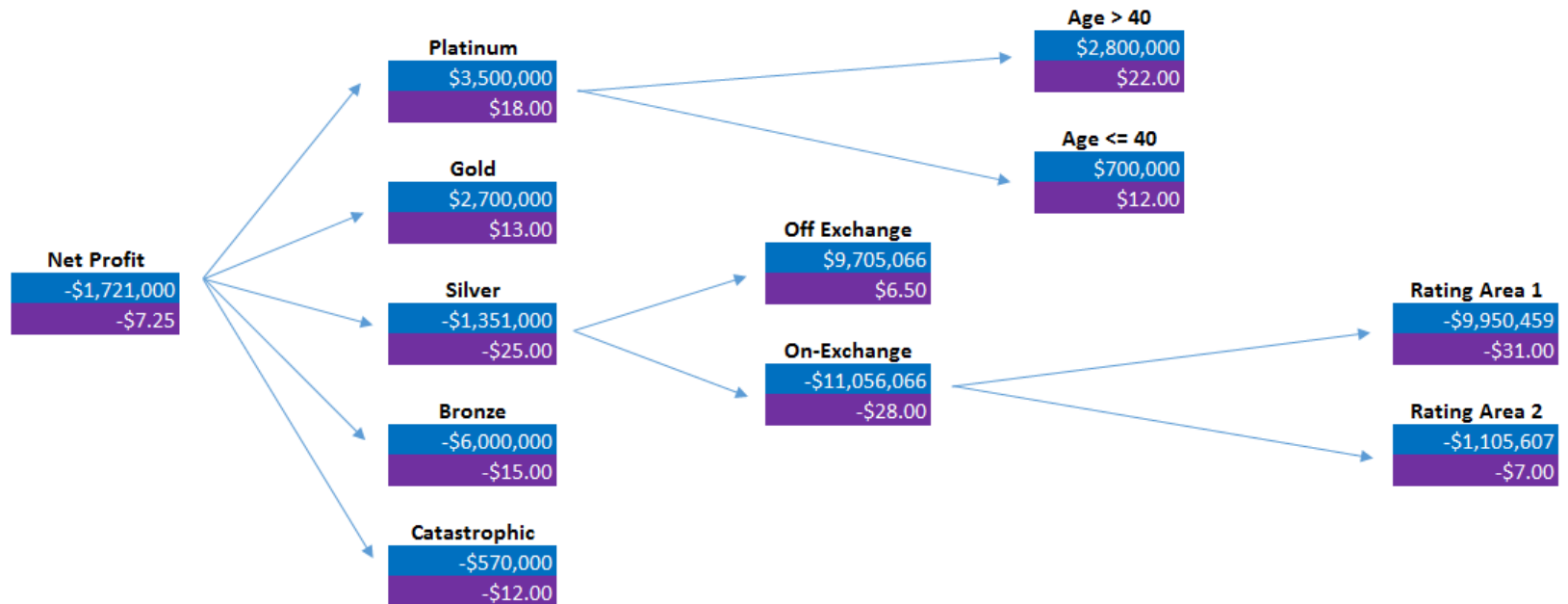
- The motivation for the study
- Two Key Ideas

# Methodology

## Risk Adjustment & Profitability

- Important for plans to analyze their data to uncover profitability drivers
- Different stories

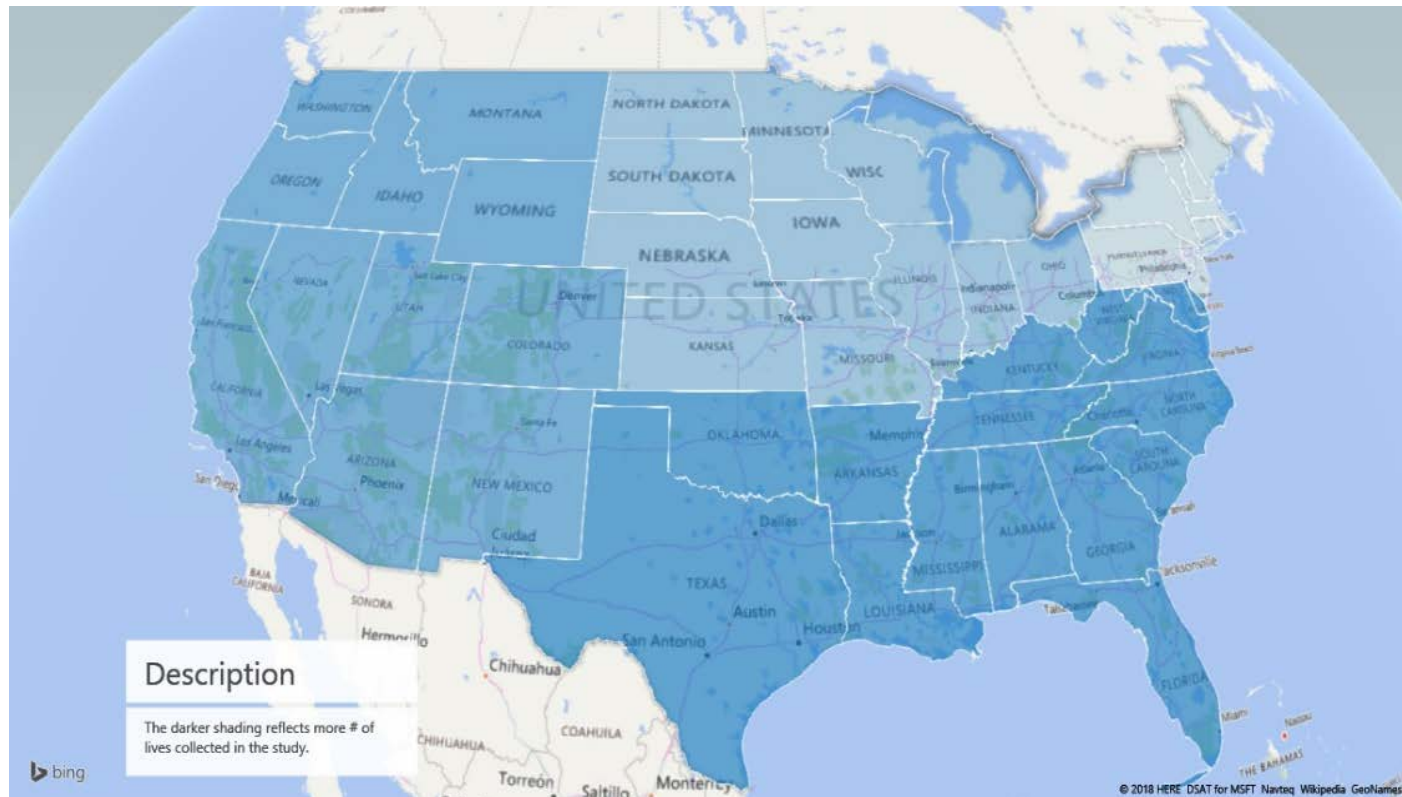
Health Plan ABC: Individual Members



**Reality:** 100 clinical categories, 5 metal tiers, 10 rating areas, 20 HIOS plan IDs, 25 demographic categories, 5 provider networks  
**Would create 13 million data slices**

# Three Years of ACA Data

- EDGE, Supplemental, CMS MLR
- Participation

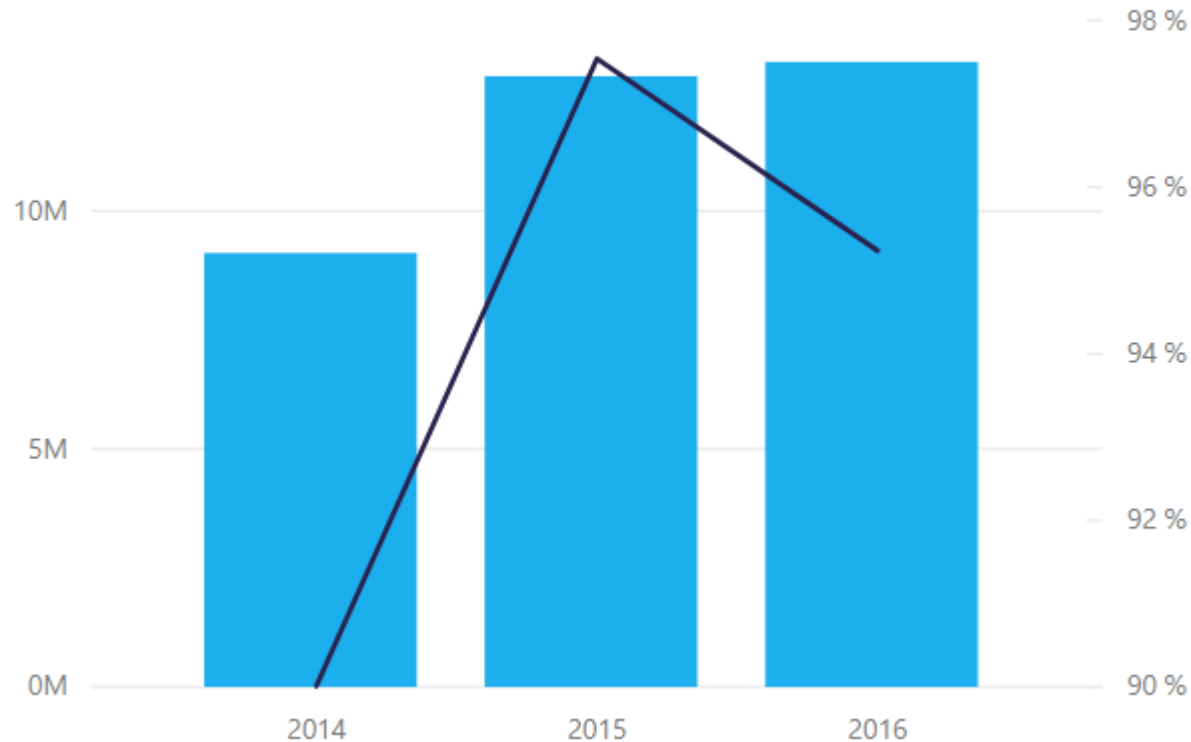


# Three Years of ACA Data

A High Level Look at the Individual Market

Covered Lives and Loss Ratio by Benefit Year

Market ● Individual ● c.LossRatio



# Three Years of ACA Data

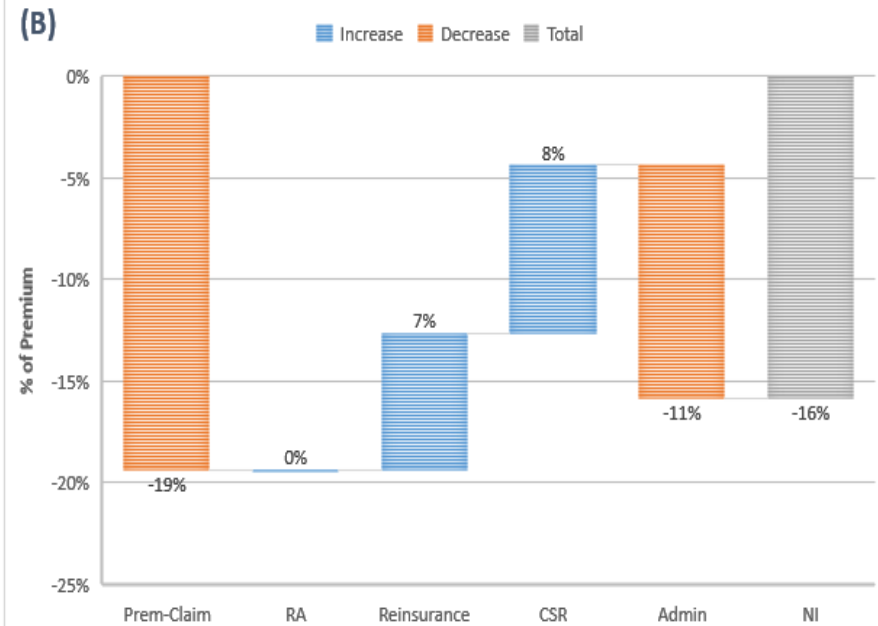
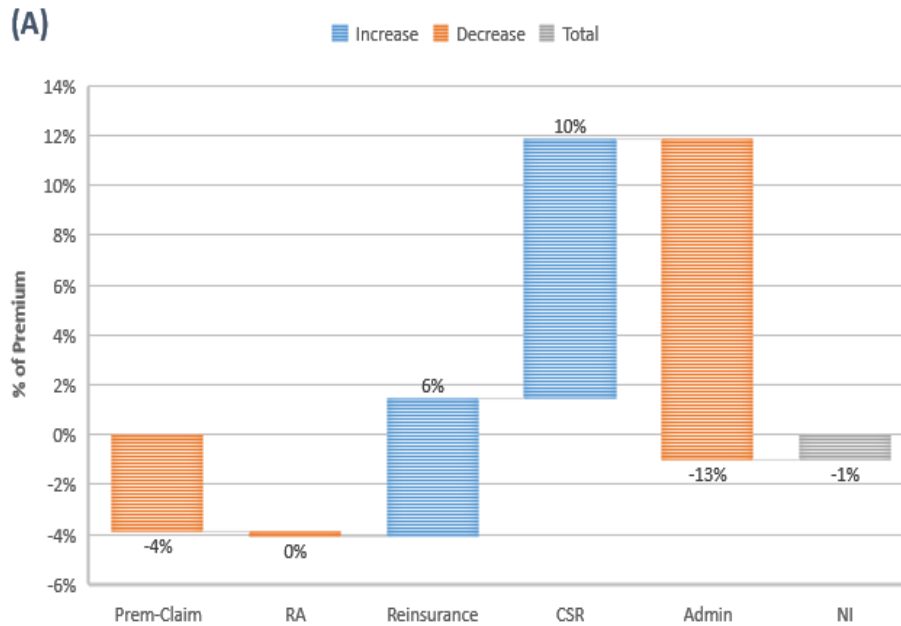
## Evolution of Net Profitability in Individual Market



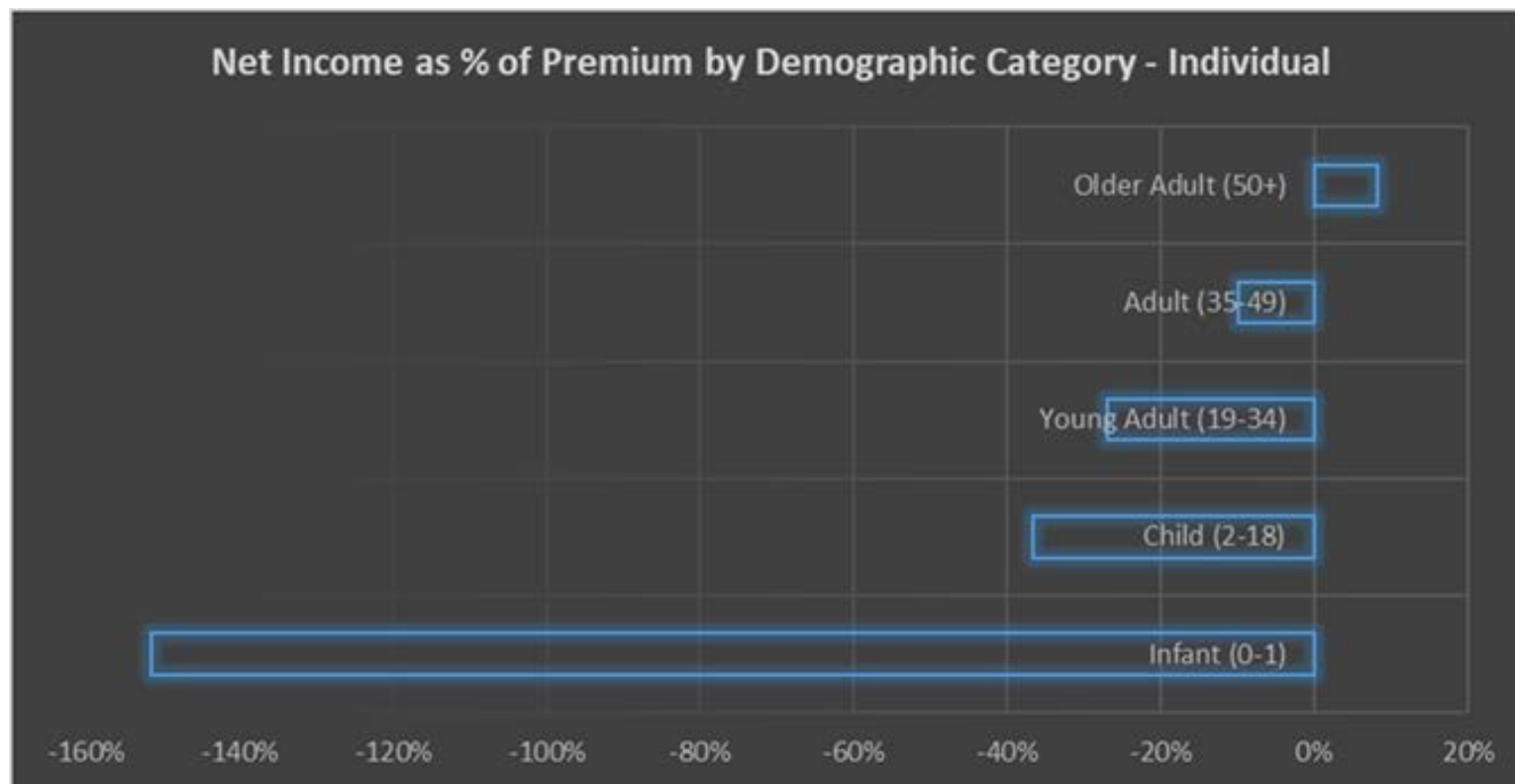


# Three Years of ACA Data

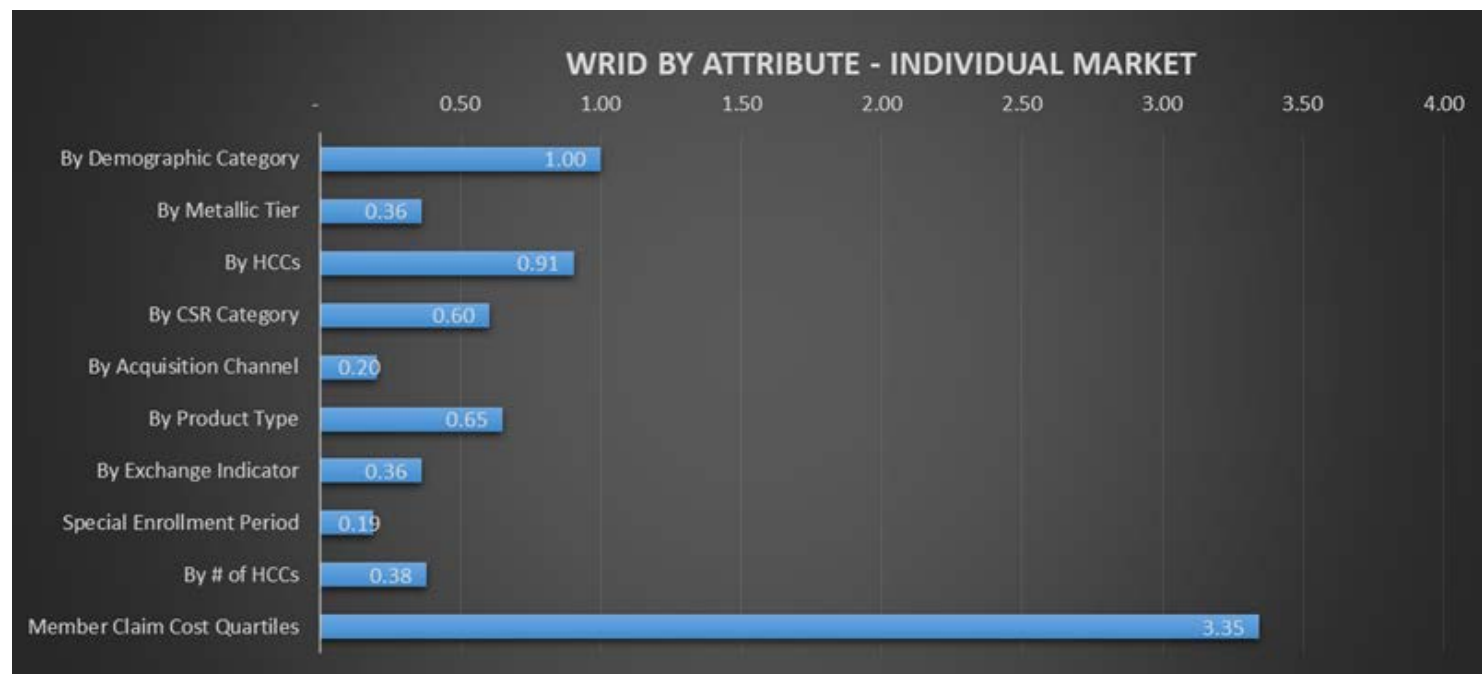
Comparison of “Successful” to “Less Successful” plans



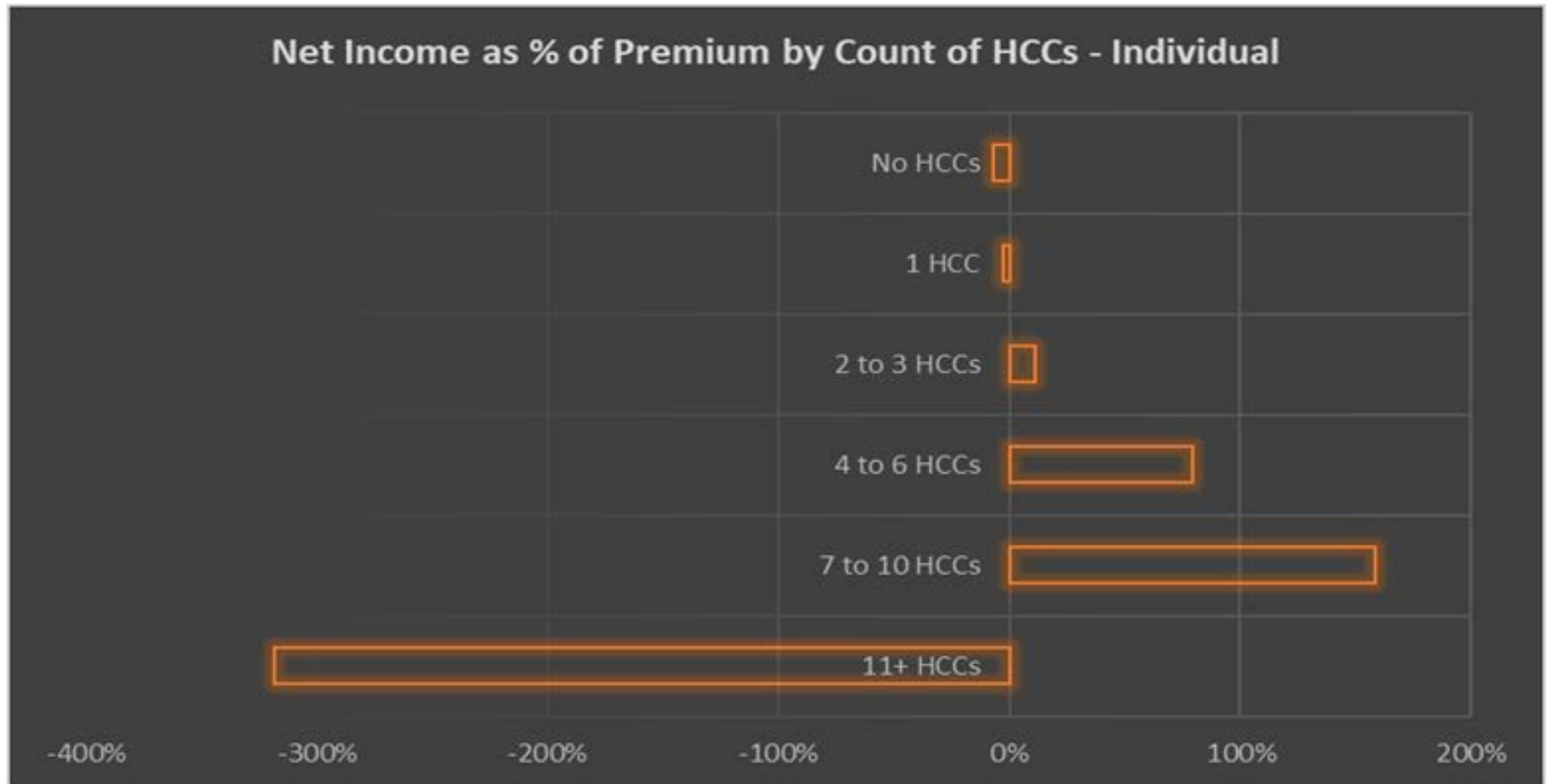
# Three Years of ACA Data



# Three Years of ACA Data

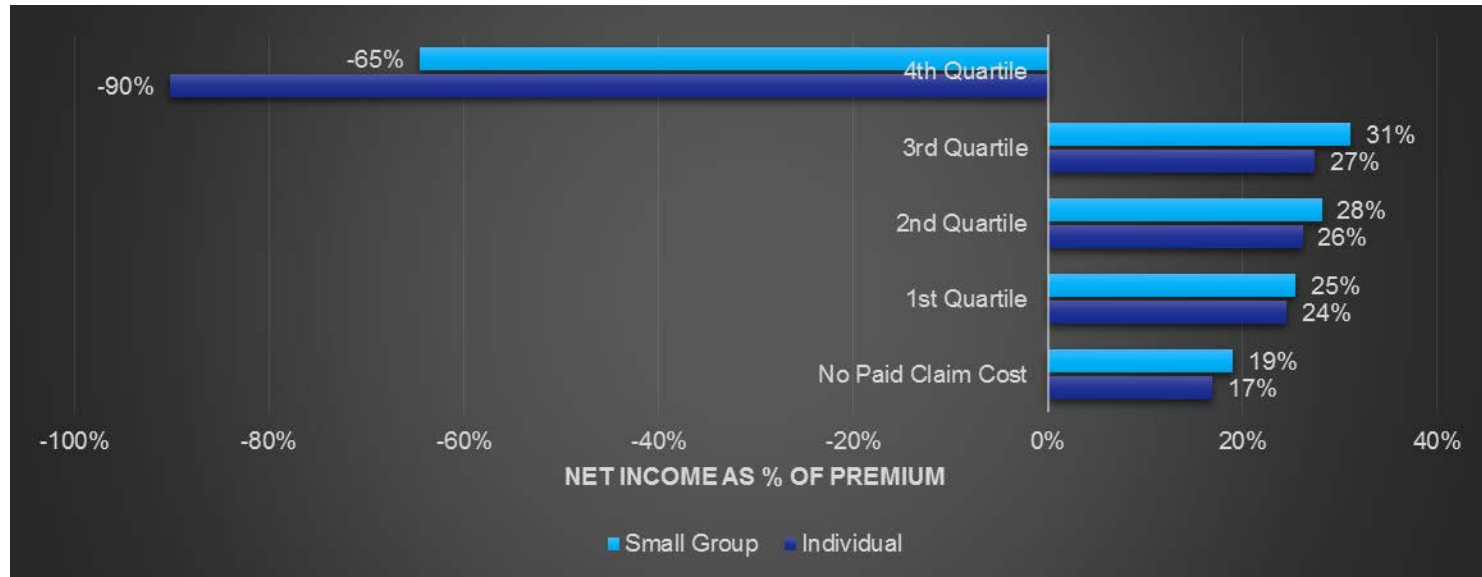


# Three Years of ACA Data



# Three Years of ACA Data

Net Income as % of Premium, by Cost Quartile & Market



# Three Years of ACA Data

Net Income as % of Premium, by Cost Quartile & Market

Individual Market - BY2016	National	
Variable Value	Average Net Income (PMPM, 1R)	WRI Distancing Measure
All	-\$16.81	3.35
Claimants in 1st Quartile	\$85.32	0.34
Claimants in 2nd Quartile	\$96.94	0.43
Claimants in 3rd Quartile	\$113.14	0.52
Claimants in 4th Quartile	-\$424.50	1.67
Enrollees with \$0 Paid Claim Cost	\$55.66	0.39

# Can we predict the 4<sup>th</sup> Quartile?

## Predictive Modeling

- The 4<sup>th</sup> Quartile: Interesting or Important?
- Random Assignment

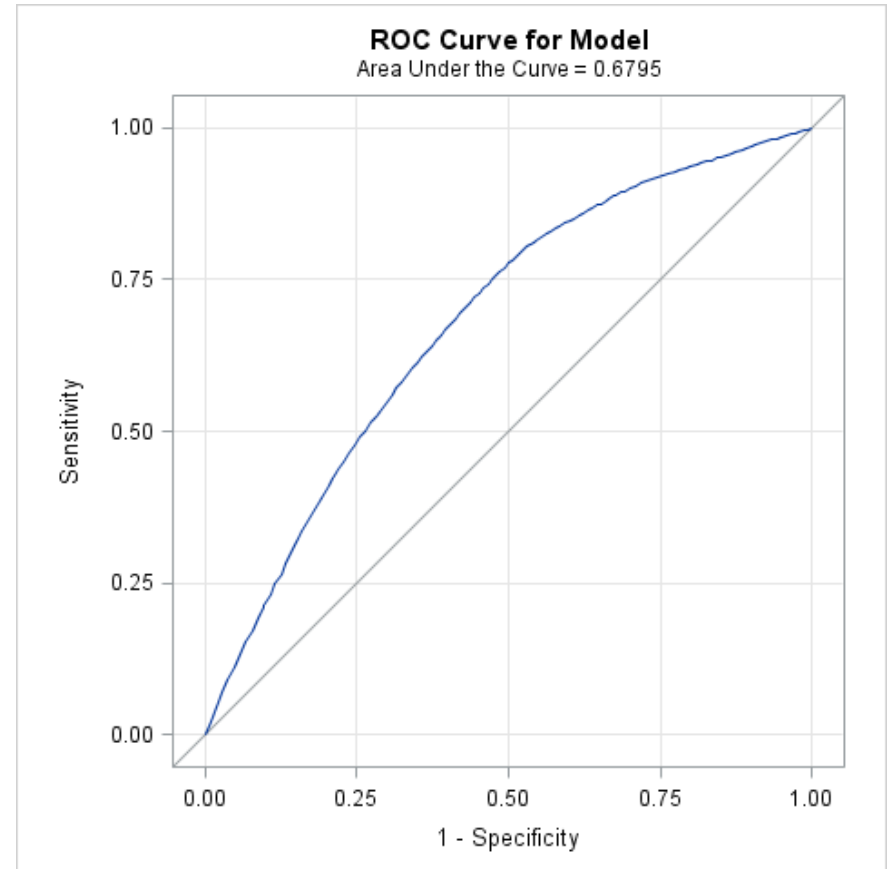
Train Data	Actual			
Predicted	1	2	Total	%
1	154,187	42,146	196,333	79%
2	42,146	11,521	53,667	21%
Total	196,333	53,667	250,000	
%	79%	21%		21%

# Can we predict the 4<sup>th</sup> Quartile?

## Predictive Modeling

### ■ Age-Gender Model

$$\ln\left(\frac{p}{1-p}\right) = a + \sum_i^{demo} b_i x_i + e$$



Train Data	Actual			
Predicted	1	2	Total	%
1	179,142	43,398	222,540	89%
2	17,191	10,269	27,460	11%
Total	196,333	53,667	250,000	
%	79%	21%		<b>37%</b>

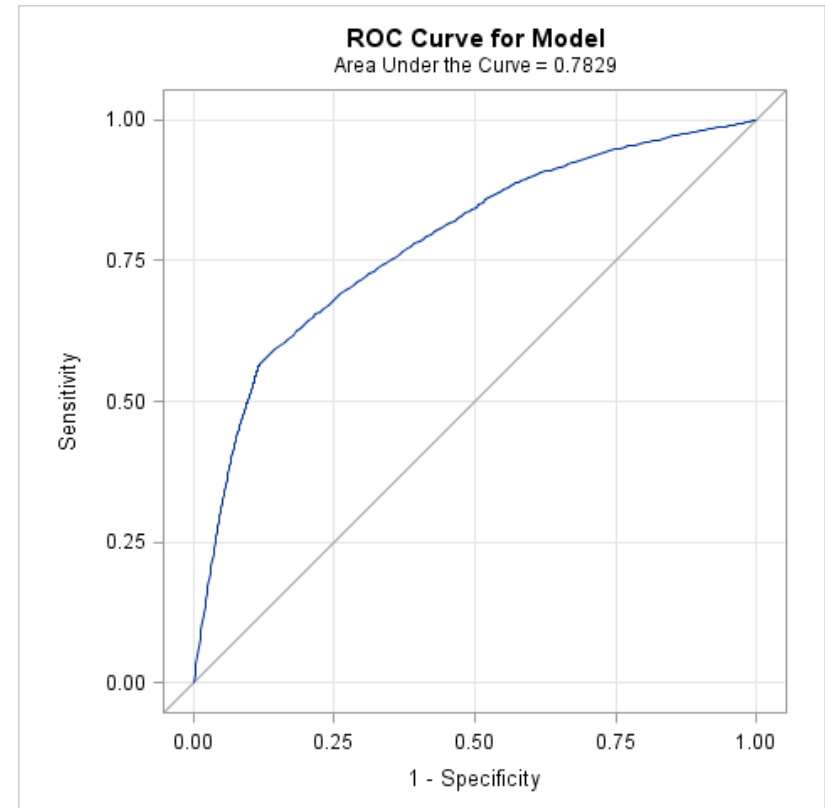


# Can we predict the 4<sup>th</sup> Quartile?

## Predictive Modeling

- Age-Gender  
+ Last Year Status Model

$$\ln\left(\frac{p}{1-p}\right) = a + \sum_i^{demo} b_i x_i + \sum_j^{prior} b_j x_j + e$$



Train Data	Actual		Total	%
	1	2		
Predicted 1	189,402	41,373	230,775	92%
Predicted 2	6,931	12,294	19,225	8%
Total	196,333	53,667	250,000	
	79%	21%		64%

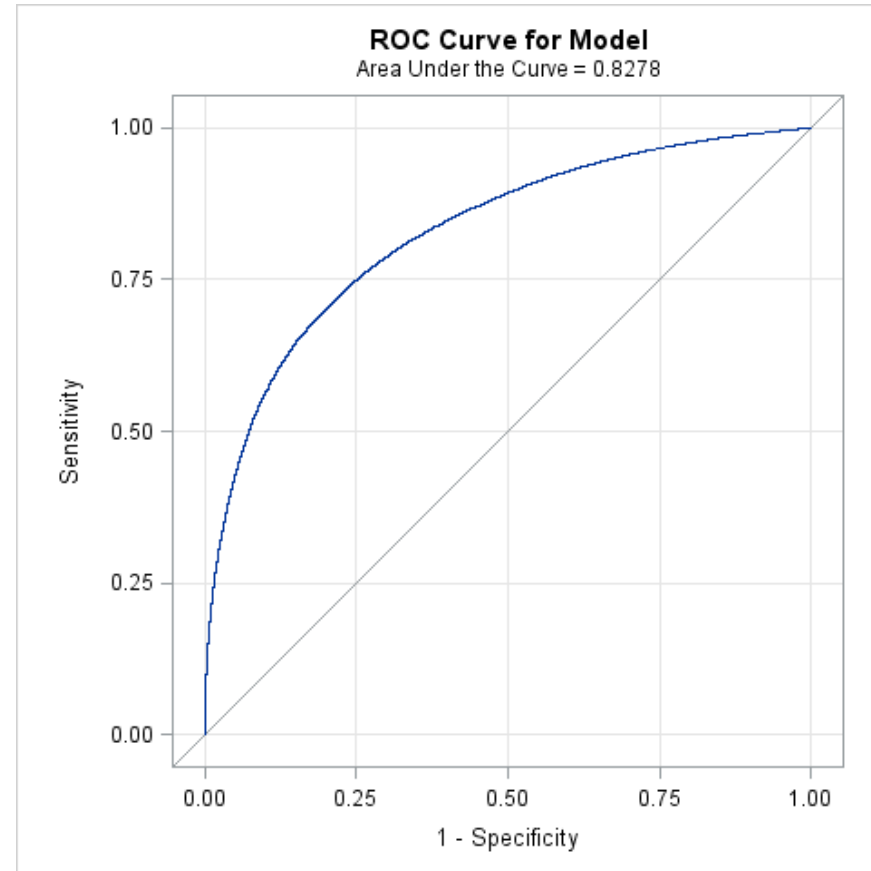
# Can we predict the 4<sup>th</sup> Quartile?

## Predictive Modeling

### ■ “Kitchen Sink” Model

Train Data	Actual			
Predicted	1	2	Total	%
1	194,328	42,764	237,092	95%
2	2,005	10,903	12,908	5%
Total	196,333	53,667	250,000	
	79%	21%		<b>84%</b>

Test Data	Actual			
Predicted	1	2	Total	%
1	194,712	42,411	237,123	95%
2	2,013	10,864	12,877	5%
Total	196,725	53,275	250,000	
	79%	21%		<b>84%</b>



$$\ln\left(\frac{p}{1-p}\right) = a + \sum_i^{\text{demo}} b_i x_i + \sum_j^{\text{prior}} b_j x_j + \sum_k^{\text{morbidity}} b_k x_k + e$$

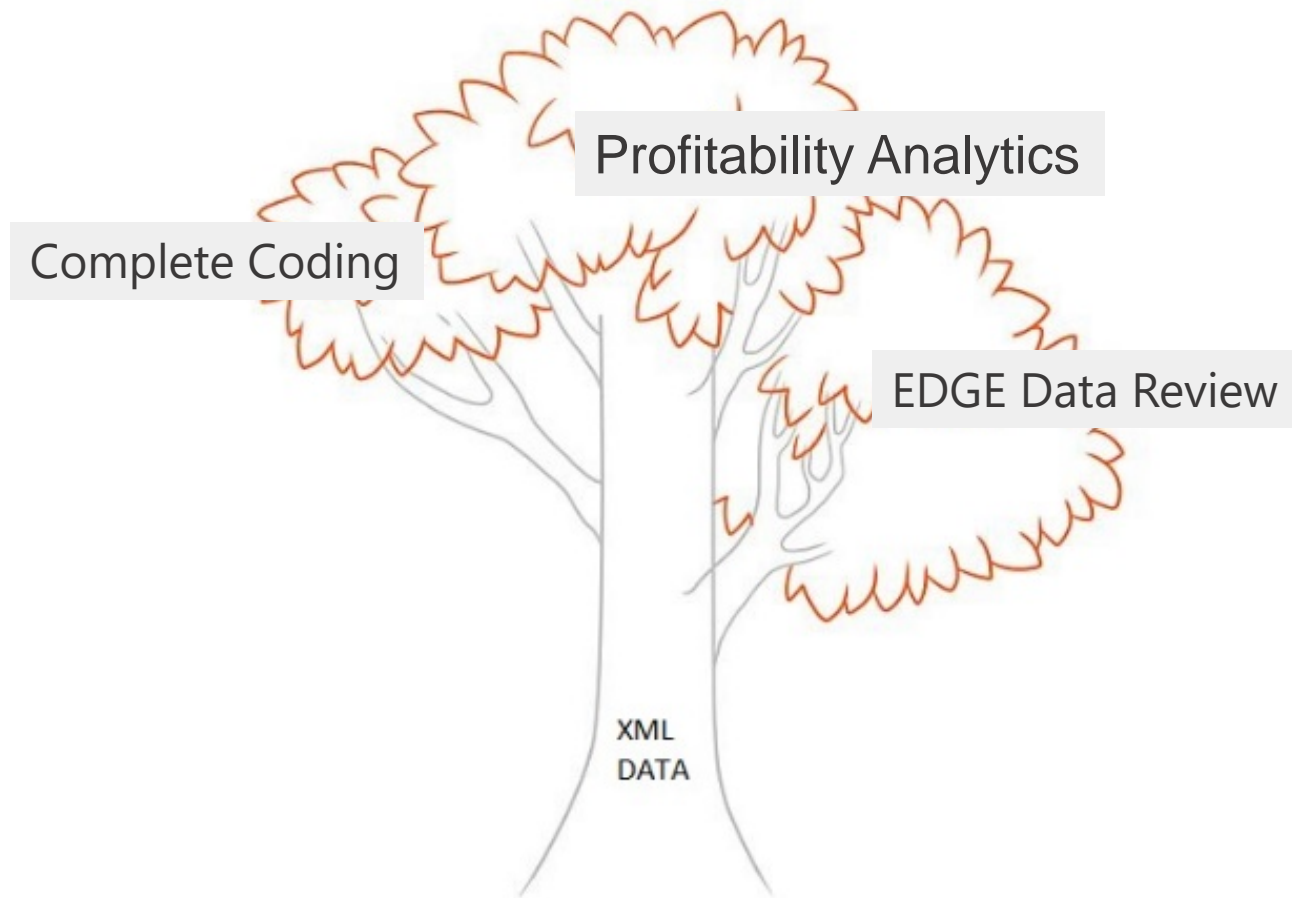
# Three Years of ACA Data

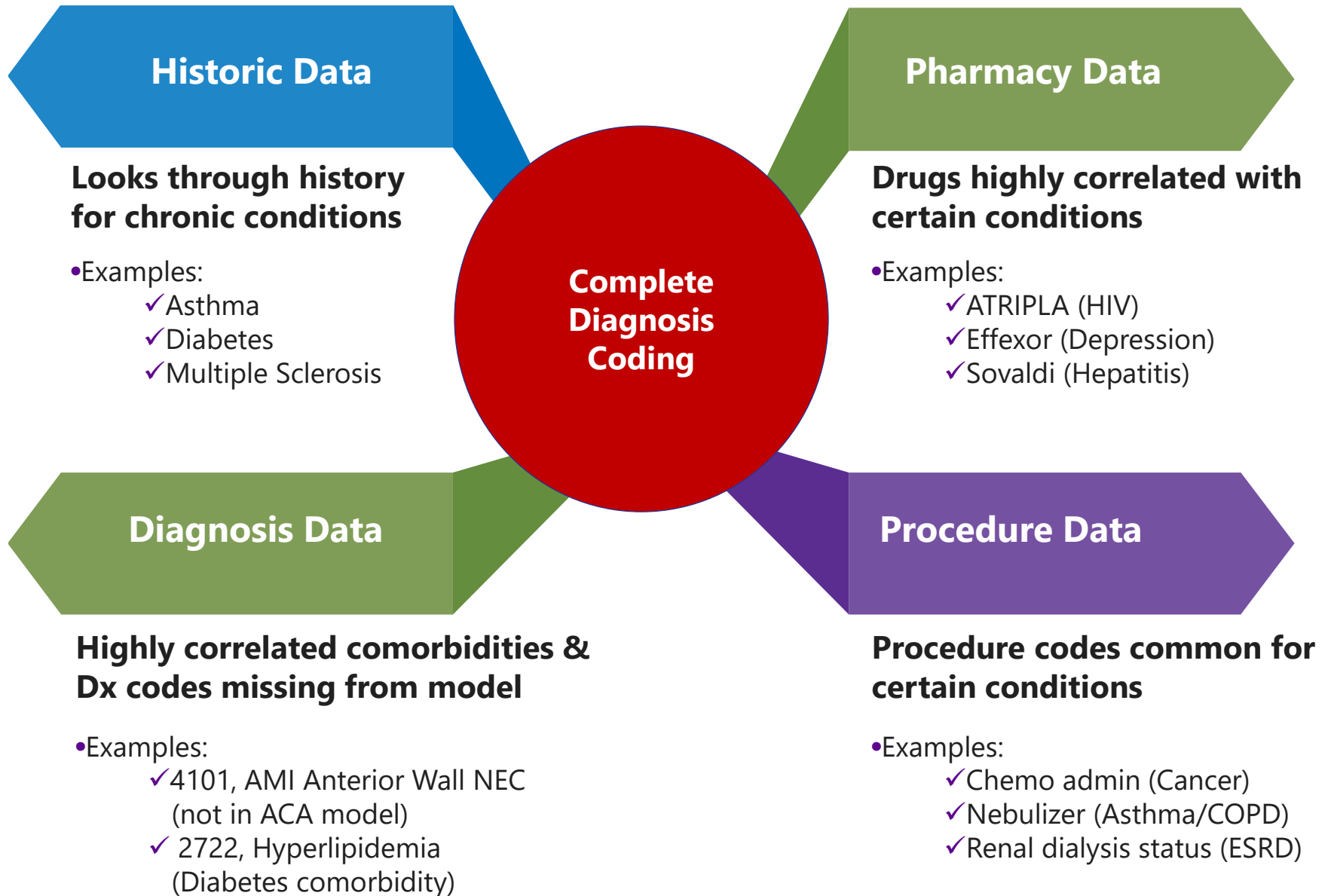
## Other Observations

- Pricing
- Contracting
- Specialty Rx
- Hierarchical Condition Categories

# Three Years of ACA Data

The Importance of Data





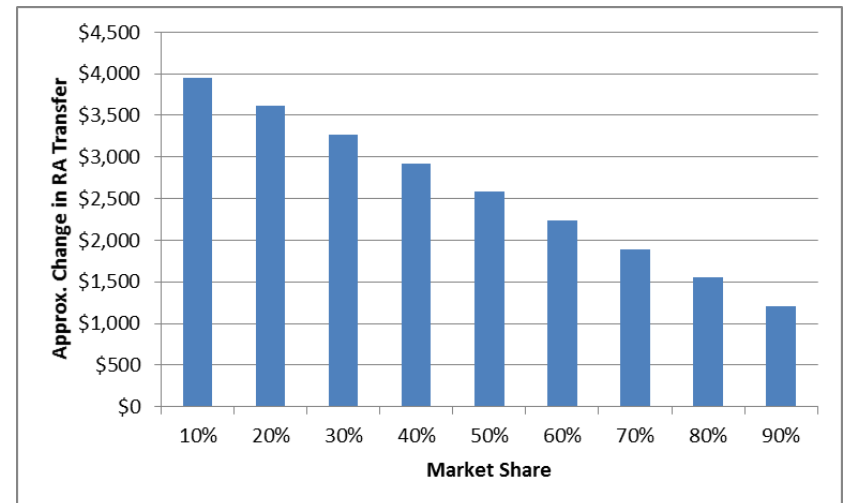
# Importance of Coding

## ■ Assumptions:

- All ACA-compliant “Silver” metal-level plan
- \$400 monthly premium per member
- 200,000 member months
- 20% market share
- Average PLRS of 1.00 vs. Market PLRS of 1.25

## ■ Results

- One member, one HCC (HCC006 / Opportunistic Infections) found & documented
- Change in transfer: approx. \$30,000
- Another member, one HCC (G01 / Diabetes) found & documented
- Change in transfer: approx. \$3,600



# Transfers can be high even for one person

More math...

Premium PMPM	\$400.00	
	<b>State</b>	<b>Member</b>
PLRS		165
IDF		1.15
GCF		0.95
AV		0.9
ARF		2.78
FIRS	1.2975	
FERS	1.1423	
Member Months		12
<b>RA Transfer</b>		\$655,381

\* Has protein-calorie malnutrition (HCC23); Liver transplant status / complications (HCC34); Major depressive and bipolar disorders (HCC88); Respiratory dependence (HCC125); Congestive heart failure (HCC130); Heart infection (HCC135); Major congenital heart (HCC138); Specified heart arrhythmias (HCC142); Fibrosis of lung (HCC162); End stage renal (184); Artificial openings for feeding (HCC253); Diabetes (G01); Mucopolysaccharidosis (G02A); Disorders of immune (G08); Drug psychosis (G09)

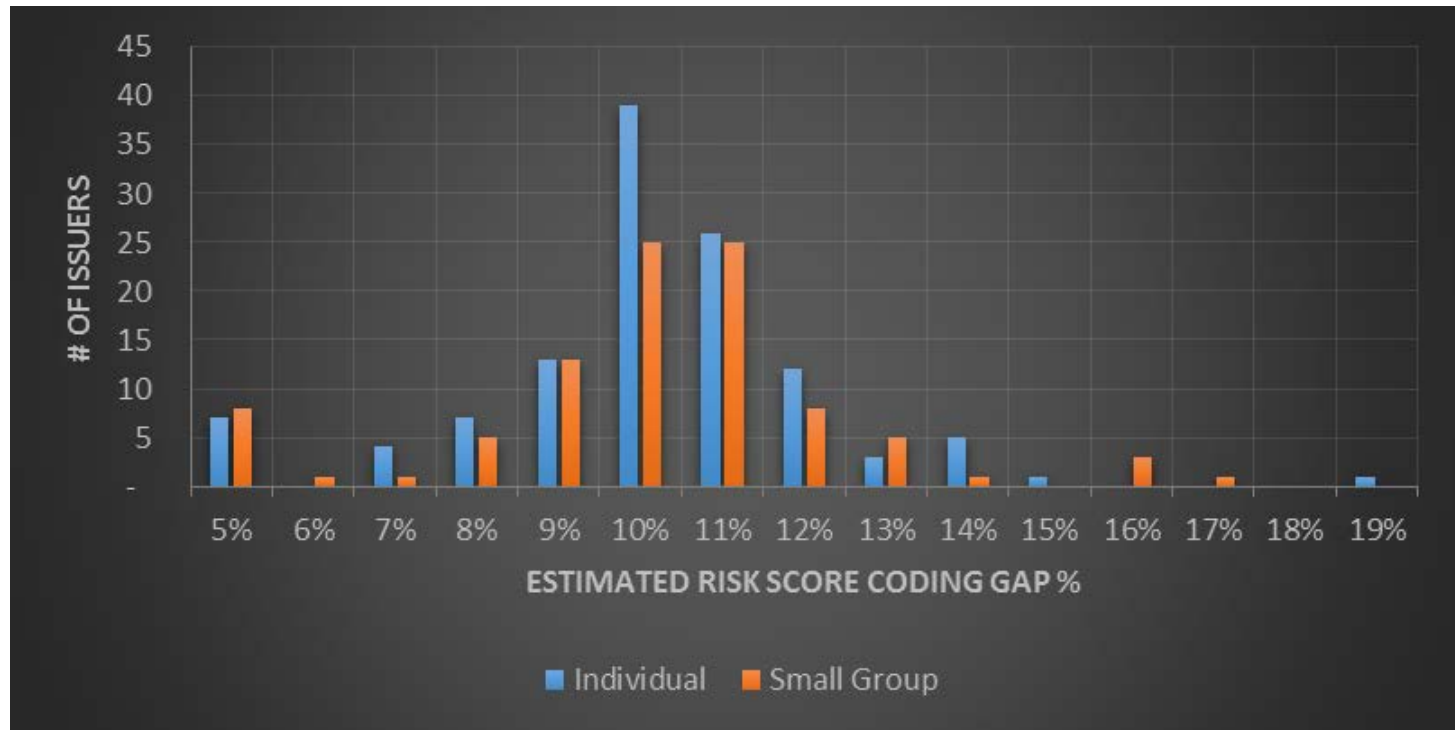
Fictitious data, similar to real-world examples.

$$\text{HHS Transfer formula: } T_i = \left[ \frac{PLRS_i \times IDF_i \times GCF_i}{\sum_i (s_i \times PLRS_i \times IDF_i \times GCF_i)} - \frac{AV_i \times ARF_i \times IDF_i \times GCF_i}{\sum_i (s_i \times AV_i \times ARF_i \times IDF_i \times GCF_i)} \right] \bar{P}_s$$

# Risk Adjustment Under ACA

## The Importance of Data

- Variation in coding completeness...





# Risk Adjustment Under ACA

## The Importance of Data

### ■ BY2016: Supplemental Diagnoses

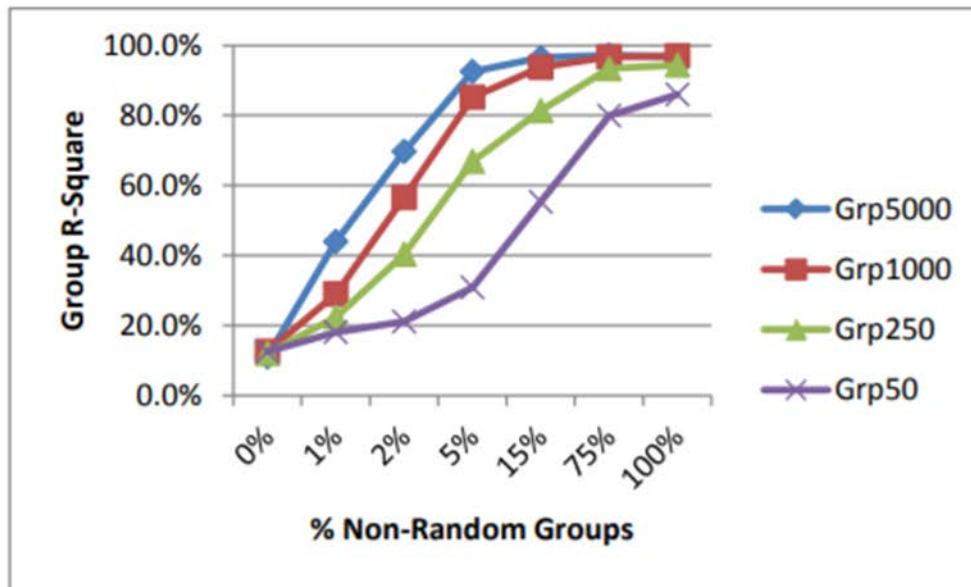
Top 10 HCCs found (by Weight)	
HCC	HCC_Description
HCC125	Respirator Dependence/Tracheostomy Status
G15	Chronic Obstructive Pulmonary Disease, Including Bronchiectasis, Asthma
HCC008	Metastatic Cancer
HCC253	Artificial Openings for Feeding or Elimination
HCC130	Congestive Heart Failure
HCC056	Rheumatoid Arthritis and Specified Autoimmune Disorders
G01	Diabetes with Acute Complications, Diabetes with Chronic Complications, Diabetes without Complication
HCC251	Stem Cell, Including Bone Marrow, Transplant Status/Complications
HCC142	Specified Heart Arrhythmias
HCC088	Major Depressive and Bipolar Disorders
Top 10 HCCs Deleted (by Weight)	
HCC	HCC_Description
G13	Respiratory Arrest, Cardio-Respiratory Failure and Shock, Including Respiratory Distress Syndromes
HCC008	Metastatic Cancer
HCC009	Lung, Brain, and Other Severe Cancers, Including Pediatric Acute Lymphoid Leukemia
HCC011	Colorectal, Breast (Age < 50), Kidney, and Other Cancers
HCC012	Breast (Age 50+) and Prostate Cancer, Benign/Uncertain Brain Tumors, and Other Cancers and Tumors
HCC023	Protein-Calorie Malnutrition
INT_GROUP_H	Interaction Group High
HCC131	Acute Myocardial Infarction
HCC184	End Stage Renal Disease
HCC142	Specified Heart Arrhythmias

# Risk Adjustment Under ACA

Bonus Topic (time permitting): Measuring Performance

- A focus on member-level accuracy

Figure 4: R-Squared vs. Percentage of Groups Created Non-Randomly



Mehmud, S., Yi, R.,  
*Uncertainty in Risk  
Adjustment; Society of  
Actuaries, 2012*

Mehmud, S., *Non-  
Traditional Variables in  
Risk Adjustment; Society  
of Actuaries, 2013*

# Items Impacting Future ACA Results

# Items Impacting Future ACA Results

- Child Rating Factors
- CSR Defunding
- ACA Risk Adjustment Changes
- 1332 Waivers
- Elimination of Individual Mandate Penalty
- Non-ACA Plans

# Child Rating Factors

## Federal Age Curve Child Rating Factors

Age	Prior	2018
0-14	0.635	0.756
15	0.635	0.833
16	0.635	0.859
17	0.635	0.885
18	0.635	0.913
19	0.635	0.941
20	0.635	0.970
21	1.000	1.000

# CSR Defunding

- Premium Impact
  - Varied by State
  - Majority of issuers increased Silver plan premiums
- Enrollment Impact
  - More eligible for subsidies
  - Higher subsidy amounts (and increased Federal spending)
  - Free or inexpensive Bronze, and less expensive Gold plans
- No change to Risk Adjustment treatment of CSR enrollees

# Risk Adjustment Changes

- Changing Risk Adjustment makes it difficult to measure actual morbidity change over time
  - 2017 - Duration Factors
  - 2018 - Reduce state average premium by 14%
  - 2018 – Incorporate prescription drugs (condition and severity)
  - 2018 - Large claims pooling
  - 2019 – Use of actual ACA data (blended) to develop RA coefficients
- Changes in risk adjustment transfers will directly impact WRI financial performance measures.

# Market Risk Changes 2016 and 2017

- Average market risk scores increased 4% and 3% on average for the individual and small group markets respectively
- Individual 4% increase would have been higher if not for metal buy-downs
- Increase was predominantly driven by an increase in the average number of coded HCCs
- Demographic risk stayed relatively stable
- Bronze off-exchange experienced a large increase in coded HCCs

Evan Morgan, Chia Yi Chin, Ross Winkelman, Tylor Steiner, "Comparison of Nationwide 2016 and 2017 ACA Markets," Wakely Consulting Group, January, 2018



# Market Risk Changes 2017 and 2018

- 2018 total risk scores decreased by roughly 5% to 7% when compared to 2017.
- The decrease is attributable to decrease in both demographic and condition risk score components.

# 1332 Waivers

- Requirements
- Claims-based reinsurance
- Condition-based reinsurance

# Elimination of Individual Mandate Penalty

- Likely ACA enrollment declines especially for unsubsidized younger and healthier enrollees
- Increased ACA premiums
- Increased subsidies and Federal spending
- Impact will vary by state
  - Market characteristics
  - State regulatory actions
- Risk Adjustment doesn't make up for overall market selection

# Non-ACA Plans

- Short Term Limited Duration Plans
- Association Health Plans
- State-based Plans (e.g. Iowa)
- Impact on ACA Enrollment, Premiums, and Subsidies

# Risk Adjustment in a Changing Market

- High risk pools and condition-based reinsurance
  - Risk adjustment is still necessary
  - Results from Wakely study
- Market bi-furcation without risk adjustment generally leads to higher ACA premiums, but how to actually risk adjust is a challenge

# Learning from 3 Years of ACA Data

## Q&A

For any follow up questions:

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