HIGH OPPORTUNITY SEGMENTATION: IDENTIFYING, ATTRACTING AND RETAINING YOUR BEST MEMBERS

November 2014

Introductions

Milliman Pacific Market Research GreenRubino

The new normal: Attraction, not avoidance



RBM process – overview



- Product Development
- Marketing
- Case Management

RBM process – overview

Methodology Overview



Who are the high opportunity members?



Data Sources

- Membership and premium/rating data (large group if pre-2014, individual otherwise)
- Medical claim data
- Expected administrative costs
- Consumer data (acquired through Milliman)
- Risk scores (HCC Commercial or Medicare)

Two-step modeling process:



Step 1 Model: Build a predictive model to identify high opportunity members in future in a broad population



Step 2 Model: Among high opportunity population, build segment models to identify which segment member belongs to

Build a predictive model to identify high opportunity members in future in a broad population

- a. Prepare independent predictor variables
 - i. Eliminate poor predictors
 - ii. Impute missing values
 - iii. Reduce number of predictors
- b. Fit logistic regression model
- c. Identify the best model
- d. Validate the model on independent sample

Prepare independent predictors

i. Recode character variables into numeric (e.g., income range; binary variables for various occupations)

Household Composition

Estimated Household Income

Old value	New Value
A = Less than \$15,000	15,000
B = \$15,000-\$19,999	17,500
C = \$20,000-\$29,999	25,000
D = \$30,000-\$39,999	35,000
E = \$40,000-\$49,999	45,000

	Old value
	A = Married (husband & wife w/ kid),
	B= Married (husband & wife no kid),
	C= 2 people, 1 male, 1 female w kid,
	D=2 people, 1 male, 1 female no kd,
<	$E = Male w/ 1 \text{ or more children} \rightarrow$
\leq	F = Male w/ no children,
<	G = Female w/ 1 or more children,
<	H = Female w/ no children,
<	K = One person (female) with child,
¢	= One person (female) w/out child,
	U = Composition unknown

New Value

- Married with children(A) Married without children(B) Unmarried with children(C) Unmarried without children(D)
- Single with children(E,G,K)

Unknown(U)/Blank

Prepare independent predictors

ii. Impute continuous missing values (via multiply imputation)

Main Data Set						
Row	MemberID	Age	Gender	Number of Cars	Income	Own a Pet
1	002689964		D	2	50000	0
2	105489962		1	3	100000	
3	225879622		1	1	75000	1
4	069879665		D	0	35000	1
5	000369714	-	D	1	48000	
6	325977453		1	0	75000	1
7	115889635		1	3	120000	0
8	023547993	30	1	3	60000	
9	108989633	45		2	80000	1
10	298785642	56	0	4	45000	1
/1	301554892	50	U		95000	
12	400157896	38	1	0	180000	0
13	501889875	22	1	1	58000	1
14	004896983	50	0	2	30000	0

Predicted Age = 39.06 + (-27.229) x Gender + (2.83) x Number of Cars + (0.00014) x Income Use this data to impute missing age

Prepare independent predictors

iii. Reduce number of predictors – cluster analysis; 565variables were reduced to 79 clusters and 36 originalvariables (remained un-clustered)

Cluster 33: Cluster 11: Marital Status - Household YES/NO Interest Code - Self-Improvement YES/NO Family Position-Husband/Wife YES/NO Interest Code - Dieting/Weight Control YES/NO Marital Status - Individual YES/NO Interest Code - Walking/Health YES/NO Dual Income Index (0 is most likely dual) Interest Code - Health/Natural Foods YES/NO Household Composition- Married w/o children Interest Code - Money Opportunities YES/NO YES/NO Interest Code - Wildlife/Environment YES/NO ZIP Level Household Income Decile Cluster 58: Survey - Hobby - Exercise 3 or more YES/NO **Un-clustered:** Survey - Investments - Medicare Coverage YES/NO Cluster 111: Survey - Reading - Thriller or Suspense YES/NO Survey - Religious YES/NO **Registered Voter Party-Democrat** Survey - Travel - Frequent Flyers YES/NO Donor Index - Religious YES/NO Survey - Sporting - Running YES/NO Donor Index - Religious BLANK/NOT BLANK Survey - Reading - Bible or Devotion YES/NO Cluster 28: Survey - Music - Christian or Gospel YES/M Zip Code Level - Homeowner Status - Probable Renter Zip Code Level - Donor Index = 10 Least Likely Zip Code Level - Dwelling Type Indicator - Apartment Zip Code Level - Generations - 44 Ethnic Second-City Strugglers Zip Code Level - Healthcare/Insurance Responder Index = 3 Sip Code Level - Length of Residence - 9+ Years

Fit logistic regression model

- Employed logistic step-wise regression
- Reviewed the following metrics in calibration and validation sets:
 - -sensitivity, specificity, positive predictive value
 - -c statistic, Sommer's D statistic
 - -SC (Schwarz Criterion or Bayesian Information Criteria) at each model step to identify optimal number of predictors
 - -Wald Chi-squared value

Predictive Model

- Identify the best model
- The best model is a balance between:
 - -Goodness of fit on validation set (lack of over-fitting)
 - -Parsimony (less predictors is more)
 - -Stable predictor variables:
 - Longevity in consumer data
 - Well populated
 - Stable coefficients in multiple calibrations

RBM - model performance

Actual Number of HO Members As Identified by:

Model Decile	Model	Random sampling	Model Lift
1	3,537	1,958	1.81
2	3,225	1,958	1.65
3	3,018	1,958	1.54
4	2,602	1,958	1.33
5	2,267	1,958	1.16
6	1,879	1,958	0.96
7	1,376	1,958	0.70
8	990	1,958	0.51
9	484	1,958	0.25
10	199	1,958	0.10



Model Lift Chart

CASE STUDY

The client

Profile:

 Midwest health plan serving both large metropolitan as well as rural markets

■130,000 members



Objective:

 Determine which prospective customers they could most profitably serve given changes instituted by the Affordable Care Act

Process



High-opportunity members

	High- Opportunity Members	Low- Opportunity Members	Total/ Average
% High Opportunity	30.0%	70.0%	100.0%
Average 2014 premium, PMPM	\$860	\$528	\$628
Average 2014 paid claim, PMPM	\$196	\$721	\$563
Average risk adj. payment/charge, PMPM	\$68	(\$21)	\$5
Average normalized concurrent risk score	0.80	1.31	1.16
Average enrollment duration (years)	1.6	1.5	1.5
Average age at enrollment	58	46	50
% Male	42%	49%	47%
Average gain/loss (allowed), PMPM	\$1,532	(\$721)	(\$45)
Average 2014 profit margin, PMPM	\$669	(\$252)	\$24
Average implied 2014 loss ratio	15%	140%	89%
Average current lifetime loss ratio	23%	127%	85%

Building margins one member at a time

For this client, we realized a spread of over \$600 between average highopportunity and low-opportunity members per month.

	High	Low	All
	Opportunity	Opportunity	Members
Average Profit Margin	\$460	(\$140)	\$20

Expanding the high-opportunity population from 30% to 37% would generate an estimated \$47.5 million in additional revenue in one year and decrease the loss ratio by 10%.

Decreasing loss ratio

Average implied 2014 loss ratio			
% of High Opportunity Members	Loss Ratio		
30%	90%		
31%	88%		
32%	87%		
35%	83%		
37%	80%		

Findings and Deliverables **EXAMPLES**

Primary Research: High Opportunity Plan Members

Goals

1) Establish and understand meaningful, relevant market segments.

2) Understand the drivers of healthcare decisionmaking and health plan choice.

3) Personify each segment in terms of needs, preferences, demographics, and psychographics.

4) Strengthen the predictive power of the step 1 RBM model.



Segmentation Approach



Lifestyle/Health Habits

- I exercise regularly
- •I keep track of my vital statistics
- •I am active in my company's wellness program



Media/Technology Adoption/Use

•Devices I use •I rely on my EMR •Willingness to interact with plan/provider online



Independence/ Reliance on Others •Speaking up for myself is not a problem •It is important for me to maintain harmony within my group



Self Control/ Discipline

- •I refuse things that are bad for me
- •I have trouble concentrating
- •I am good at resisting temptation



Opinion-Seeking Tendency

•When it comes to healthcare, I like to rely on my doctor's advice •I ask for advice when switching health insurance



Demographics •Gender

•Race

Income

November 7, 2014

Example: High-opportunity segments



Primary Research – the details

Questionnaire Design

- Must classify the high opportunity group into meaningful marketing/strategy based segments.
- Fourteen (14) constructs tested for reliability and validity. Reversed scales deployed to allow for assessment of individual respondent face validity.
- Discriminant analysis (first 100 interviews) to reduce respondent burden.
- Final length = 25+ minutes.

Data Preparation

- Recode scales/review all individual data points.
- Missing/incomplete data imputed using a mixture of mean average of individual variables and computed variables for entire constructs.
- Those with more than one missing value for any one construct were evaluated for continued inclusion.

Primary Research – the details

Preliminary Analysis

- Standardized to z-scores.
- Factor analysis to determine reliability and validity of constructs.

Cluster Analysis

- · K-Means Cluster Analysis.
- Five different possible solutions (3, 4, 5, 6, and 7-segment solutions).
- Of the 14 constructs, nine (9) used in final classification model.
- Questions added/subtracted from the solution to evaluate the best possible fit.
- Possible solutions applied to hold out sample.

3X predictability, 2x the industry standard

Actual Number of HO Members As Identified by: Model Random Model **Model Lift** Decile sampling 1,958 1.81 3,537 2 3,225 1.65 1,958 3 3,018 1,958 1.54 4 2,602 1,958 1.33 5 2,267 1,958 1.16 6 1,958 0.96 1,879 7 1,376 0.70 1,958 8 990 1,958 0.51 9 0.25 484 1,958 10 199 1,958 0.10

Predictive Power Results: Summary of Single Segment Model Lift

Model Decile	Number of Segment Members (Actual)	Final Model Lift
1	54	2.97
2	39	2.14
3	25	1.37
4	17	0.93
5	13	0.71
6	16	0.88
7	3	0.16
8	6	0.33
9	5	0.27
10	4	0.22

Plan Design by Segment – Choice Based Conjoint Exercise.

In order to determine how consumers in the high opportunity group approach the task of choosing a health care plan, a choice based conjoint (CBC) exercise is deployed.



ER

\$150 co-pay \$250 co-pay 0% after deductible 20% after deductible 30% after deductible 40% after deductible



Prescriptions Generic/Preferred Brand/Non-preferred Brand/Specialty \$5 / \$40 / 50% / 50% \$10 / \$60 / 50% / 50% \$25 / \$100 / 50% / 50% 20% after deductible Covered after deductible Network HMO PPO Narrow Network **Profile**



Example persona: Perfectionist

I am all about making sure that the health challenges I have don't get in the way of me living a long and healthy life. As far as I know, I only get one body in this lifetime!

Evelyn might have type II diabetes, but she's got at least one gold star for her superb job managing it. She's a freelance consultant with two college-age kids and an active husband. She's all about getting out ahead of her health issues, while also managing those of her family. She doesn't stop with what her doctor tells her to do; she's in pursuit of the diet, exercise and lifestyle that's going to keep her the healthiest she can be. That means biking on weekends, tennis club with her girlfriends and a regular glass of red wine in the evenings.

Evelyn Jones

Gender: Female

Age: 56

Financial Status: Middle Class

Employment: Full-Time

Family: Two children in college

Health issue: Type II diabetes

What She Thinks

She has complete control over her own destiny.

Health plans don't make it easy for people to be healthy.

Her doctor is a good start but there's probably information out there that she's missing.

What She Does

Constantly pursues information.

Leverages her friends and family for input.

Regularly reads scientific publications.

Picks the plan that will optimize her and her family's health, even if it means spending a bit more.

Technology IQ

Never leaves home without her iPhone and iPad.

Uses her desk and mobile computer daily.

Visits a wide range of websites when she has health-related questions pertaining to her or her family—from online communities to WebMD.



Example: Perfectionist experience map



Example: Landing page and offer based on search

SAMPLE HEALTH PLAN

ABOUT US CONTACT



Free Type II Diabetes Cookbook: Every Night Meals for the Whole Family

Eating well benefits every member of the family, not just those with Type II Diabetes. The trick is finding recipes everyone will love. With our new cookbook, you'll get step by step instructions for weeknight-ready meals that meet your new goals of lower sugar, salt and fat but that don't compromise on taste.

You'll get recipes for all your favorites including:

Italian | Asian | Latin | American



THANKS FOR YOUR TIME TODAY.

QUESTIONS?