End-to-End Health Plan Segmentation Using Predictive Analytics

Monday, September 22, 2008
4:00 p.m.

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Susan Novak
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Discussions Topics

Traditional Segmentation Through Predictive Analytics

Market Drivers for a New Approach to Segmentation

An Innovative Approach to Health Plan Segmentation

Business Applications

Benefits to Health Plans

Questions and Answers
Traditional Segmentation Through Predictive Analytics
Traditional Segmentation Through Predictive Analytics

Overview of Traditional Segmentation Approach

Illustration of Traditional Segmentation Approach

Lessons Learned
Predictive modeling in healthcare began to solve a widely known problem:

- Small percentage of members account for a disproportionately large percentage of healthcare costs

Cost triggers used to identify candidates for medical management

Most predictive models heavily dependent on claims and authorization data

Initial applications were disease specific but evolved to support patient centric approach

Lack of utilization data made models ineffective
Traditional Segmentation through Predictive Analytics

Illustration of traditional segmentation approach

Limitations:
- Neglects 80% of members
- Leverages internal data only
- No insight into drivers of consumer behavior
- Not a holistic approach to assessing individual’s risk
- Does not engage members earlier in the lifecycle
- Driven primarily on reducing MLR
Traditional Segmentation through Predictive Analytics

Lessons learned

- Initial models heavily dependent on adjudicated claims and authorization data
  - Not all claims are created equal
  - Incomplete data, up-coding, claims submission lag, false positives – *Need more data*
- Identified high risk members did not consistently have high likelihood to engage in care
- High risk should not be measured on PMPM alone
- Claims and authorization data ignore behavioral, demographic, and geographic aspects, and their impact on overall risk
- Cost triggers identified members exceeding cost threshold; but low cost does not equal low risk
- Lack of utilization data makes identifying high risk members difficult
- PM had limited applications for underwriting, new market penetration, target marketing, member retention, and engagement
Market Drivers for a New Approach to Segmentation
Market Drivers for a New Approach to Segmentation

The State of the Healthcare Industry

The Shift Towards Consumerism

Key Issues and Market Needs
The State of the Healthcare Industry

Overall premium growth is declining, challenging health plan revenues and profitability

Increases in Health Insurance Premiums Compared to Other Indicators, 1988-2006

Source: Kaiser Foundation
Forecasted product shifting to more affordable, consumer-driven products will result in lower revenues and threaten margins.

**Projected Relative Market Share Among Health Plans, by Plan Type, 2000-2010**

- **CDHP**
- **Conventional**
- **PPO**
- **POS**

**Average Annual Premiums for Covered Workers, by Plan Type, 2006**

- **Single**
  - Worker Contr.: $620
  - Employer Contr.: $4,201

- **Family**
  - Worker Contr.: $569
  - Employer Contr.: $11,383

Source: 2003 Forrester Research
Source: Kaiser Foundation
The State of the Healthcare Industry

Historically, decreases in spending on housing, clothing and food subsidized rising healthcare costs; however, healthcare costs will soon eclipse disposable income causing individual consumers to more closely evaluate their tradeoffs.

Uses of Disposable Income (1930-2000)

- Food
- Clothing
- Housing
- Healthcare

Source: Bureau of Economic Analysis
The State of the Healthcare Industry

Employers – the industry’s traditional “customer” – are not only reducing benefits, but are opting out of offering coverage all together.

Percentage of Firms Offering Health Benefits, 1996-2005

- 69% in 2000
- 68% in 2001
- 68% in 2002
- 66% in 2003
- 63% in 2004
- 60% in 2005

Source: Kaiser Foundation

Percentage Point Change Among Non-elderly Adults 19-64 by Coverage Type, 2000-2004

- Employer-Sponsored Insurance: -6.0% to 2.0%
- Individual Insurance: -4.8%
- Medicaid: -4.0%
- Uninsured: -2.0% to 0.0%
- Employer-Sponsored Insurance: 2.7%
- Medicaid: 1.5%
- Individual Insurance: 0.2%

Source: Kaiser Foundation
The Shift Towards Consumerism

With the employer role reduced, health plans face new competition that is “filling the void” by developing relationships with the end consumers.

**Infomediaries**
Building brand as trusted advisors and owning consumer data
*e.g.* Web MD, Revolution Health

**New Products from Traditional Competitors**
Successfully targeting & building relationships with specific market segments
*e.g.* Tonik, Humana

**Retail**
Established brands & direct consumer relationship
*e.g.* Wal-Mart, Minute Clinic

**Financial Services**
Bringing advanced direct-to-consumer marketing capabilities to healthcare
*e.g.* Mastercard, BankFirst

Source: Bureau of Economic Analysis
The Shift Towards Consumerism

New entrants and traditional competitors are improving their understanding of individual consumers and applying this understanding to marketing, distribution, products and services.

<table>
<thead>
<tr>
<th>Threat</th>
<th>Capability</th>
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<tbody>
<tr>
<td>Disease Management Vendors</td>
<td>- Utilizes advanced predictive modeling to identify ROI and readiness to change</td>
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<td>- Allocates resources to address biggest impact cases</td>
</tr>
<tr>
<td>Financial Services Companies</td>
<td>- Applies sophisticated consumer segmentation and profitability analysis</td>
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<td>- Practices direct-to-consumer and targeted marketing campaigns</td>
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<tr>
<td>Data / Informatics Vendors</td>
<td>- Positions to “own” consumer data and relationship</td>
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<td>- Leverages technology to provide highly personalized services</td>
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<tr>
<td>Traditional Competitors</td>
<td>- Invests in advanced data analytics to understand behavior</td>
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<td>- Designs and marketing products specifically for young &amp; healthy</td>
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<td>- Attracts specific segments through creative, targeted campaigns</td>
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<td>- Rewards health and “good health consumers” through incentives</td>
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Key Issues and Market Needs

*Winning health plans will develop a superior understanding of the individual consumer and use it to attract and retain the most desirable customers.*

<table>
<thead>
<tr>
<th>Issue</th>
<th>Impact</th>
<th>Need</th>
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<tbody>
<tr>
<td>Premium Growth Declining</td>
<td>Decreased Profitability</td>
<td>Attract New Membership &amp; Retain Current Members</td>
</tr>
<tr>
<td>Shift to Lower Revenue Product</td>
<td>Decreased Profitability</td>
<td>Attract New Membership &amp; Retain Current Members</td>
</tr>
<tr>
<td>Consumer Changing: Employer to Individual</td>
<td>Decreased Membership &amp; Revenue</td>
<td>Attract New Membership, Retain &amp; Create Loyal Members</td>
</tr>
<tr>
<td>Lower Consumer Spending on Health Insurance or Opting Out of Coverage</td>
<td>Decreased Revenue</td>
<td>Retain &amp; Create Loyal Members</td>
</tr>
<tr>
<td>New Competitors for Relationship with the Consumer</td>
<td>Reduced Retention &amp; Loss of Revenue</td>
<td>Proactively Establish Position as Owner of Consumer Relationship</td>
</tr>
</tbody>
</table>

Source: Bureau of Economic Analysis
An Innovative Approach to Health Plan Segmentation
An Innovative Approach to Health Plan Segmentation

Overview

Deloitte Consulting’s Predictive Analytics Framework

It’s All About Data

Turning Analytical Insight into Action
An Innovative Approach to Health Plan Segmentation

End-to-end Segmentation through Predictive Analytics allows health plans to:

- Proactively identify and improve business outcomes from acquisition of new customers to retention and loyalty of profitable members
- Improve engagement and clinical outcomes for high risk and high cost customers

Through improved segmentation across the entire plan’s population, health plans can:

- Take a life-cycle view of managing risk
- Implement appropriate business process improvements to efficiently improve clinical and non-clinical outcomes across multiple member touch points
- Emerge as a customer-centric leader in today’s Zero Sum Game industry
An Innovative Approach to Health Plan Segmentation

Deloitte Consulting’s Predictive Analytics Framework can offer health plans the opportunity to take a lifecycle view of managing risk.

- Benchmark Data
- EMR
- Internal Claims Data
- Lifestyle Data
- Demographic Data
- Census Data

Case Management/Disease Management

Deloitte’s End to End Segmentation

- Identification
- Enrollment
- Retention
- Medical Management, Member Services, Policy and Operations

New Member Acquisition
- Group Underwriting
- Sales Force Effectiveness
- Member Retention

New Product Offerings
- Target Marketing
- Health Education
- Disease Management

Identification, Enrollment Retention
Deloitte’s Predictive Analytics Framework

Approach supplements internal plan data with external consumer data; uses advanced statistical analysis to define members desires and needs; gains insight into profitable members with limited claims experience.

Innovative Data Sources

- Non-traditional external zip code or household level data sources
- Electronic Medical Records
- Benchmark Data
- EASI Data
- Census Demographic Data
- Claims Data
- Customer Service Data
- Pharmacy Data

Customized Segmentation Analysis

Data Aggregation & Cleansing
Evaluate and Create Variables
Develop Segmentation Model
Develop Segmentation Profiles

Business Implementation

Resulting Programs:
- Targeted Outreach
- Incentives / Rewards Programs
- Product Design / Rationalization
- DM Program Compliance Programs
- Personalized Customer Service
- Sales Channel Alignment
- Improved Disease and Case Management
Deloitte’s Predictive Analytics Framework

Model produces a score of 1 – 100 indicating the likelihood that a health plan member will dis-enroll in the next 12 months

Predictive Model Equation

\[ A(DocDist)^B + C(PanelSize)^D + E(ProvSpec)^F + G(CaseMix)^H + I(AvgMemAge)^J + K(PriorLapse)^L \]

Weights/Coefficients

\[ SCORE = 65 \]

Members at Greatest Risk of Dis-enrolling

Average Dis-Enrollment Rate

Members Likely to Recertify with Minimal Intervention

~80 - 100 Variables

Examples
- Utilization Index
- Co-morbidities
- Age and Sex
- Prior Lapse in Enrollment
- Marital Status
- Provider credentialing data
- Unemployment in the area
- Family Size
- Income Strata
- Providers per capita
- Provider panel size
- Provider specialty
- Procedures performed
- Duration with plan
- Lifestyle Index
- Investments Index
It’s All About Data

Innovative data sources, unique variables derived from traditional data sources are key to developing robust analytic solutions that help health plans segment their population across the full spectrum of risk.

**Traditional Claims Data Sources**
- Concentration of cardiologists within a five mile radius
- Distance from the member’s home to their primary care physician
- Average days lapse between filled scripts

**Lifestyle Data**
- Exercise equipment purchase within the past twelve months
- Active gym membership
- Body Mass Index and Family Disease History (EMR derived data)

**Demographic Data**
- Household Size and Income
- Graduate School Degree
- Number of Cars in Household
- Third Party Demographic Group Assignment (Claritas, Equifax)
Turning Analytical Insight into Action

A model to measure a member’s likelihood to dis-enroll

Members with strong affinity and loyalty with health plan

Members with a moderate chance of dis-enrolling

Members with a high likelihood to dis-enroll in the next 12 months
Business Applications
Business Applications

Why segment your customers?

Segmentation applications across the health plan

Three applications
Business Applications

A well-developed segmentation model forms the starting point for a variety of improvement opportunities across the health plan.

- To understand how to reach the consumer
- To understand what products & services the consumer is looking for
- To understand the consumer’s support needs
- To understand the value of the consumer

Why Segment Consumers?
Business Applications

Improved customer understanding can be applied across the health plan organization to improve products and services

<table>
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<tr>
<th>Functional Area</th>
<th>Applications</th>
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<tbody>
<tr>
<td>Sales &amp; Marketing</td>
<td>Align sales channels to reach target customers</td>
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<td></td>
<td>Develop more targeted marketing campaigns</td>
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<td>Design incentive programs to attract and retain profitable members</td>
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<tr>
<td>Products &amp; Pricing</td>
<td>Custom design products to meet specific segment needs - Products reflect clear value proposition to a unique customer segment</td>
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<tr>
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<td>Inform product pricing</td>
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<tr>
<td>Customer Service</td>
<td>Direct customers to preferred service channels</td>
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<tr>
<td></td>
<td>Anticipate customer needs to prevent costly, frustrating interactions</td>
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<tr>
<td></td>
<td>Develop “Personalized” web / self-service tool design</td>
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<tr>
<td>Medical Management</td>
<td>Identify “readiness/propensity to change”</td>
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<tr>
<td></td>
<td>Improve engagement and compliance by aligning incentives / rewards</td>
</tr>
<tr>
<td>Provider Relations</td>
<td>Improve provider relationship with providers by sharing consumer insight</td>
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<tr>
<td></td>
<td>Improve quality of outcomes</td>
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</tbody>
</table>
Three examples of how improves predictive analytics and segmentation can improve health plan performance:

- Loyalty and Rewards Program Design
- Improved Medical Management
- Improved Lead Generation
Business Applications: Member Rewards Programs

*Segmentation is critical to maximize effectiveness of member rewards and loyalty programs*

**Example Segmentation Results**

- **“Recent Graduate”**
  - Health Status: Health, Active Lifestyle, Low Risk
  - Characteristics: Highly educated, environmentally conscious

- **“Kids & Cul-de-Sacs”**
  - Health Status: Varies, but overall Health Conscious
  - Characteristics: Child-centered products and services

- **“Mover & Shakers”**
  - Health Status: High Cholesterol, High Stress, Insomnia
  - Characteristics: Business bent, has a home office, travels extensively

- **“Golden Years”**
  - Health Status: Overweight, diabetic, low physical activity
  - Characteristics: Community ties / involvement, Values family, Pursues hobbies

**Example Member Loyalty Actions**

- Targeted Marketing
- Fitness Club Memberships and Discounts
- Child Health Education Programs
- Outdoors Clubs

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**Health Response Track**

Engage high cost / high risk members in prevention and condition management activities

**Loyalty Track**

Show low cost members the value of the health plan to increase loyalty

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Nichole, 24

The Johnsons

David, 38

Mary, 64

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Business Applications: Right Medical Management

An end to end approach to segmentation can help address many of the challenges of medical management program participation

Evaluate Challenges
• Few programs evaluate specific costs for those who declined
• Few programs track why members did not engage

Identify Challenges
• Data is sometimes 9–12 months old
• Identify more members than DM can manage
• Reliant on claims data only
• Few referrals from other departments

Intervene Challenges
• Nurse has little insight into member lifestyle or values to use in engaging member in a discussion of benefits

Enroll Challenges
• Members difficult to contact live
• Member lacks interest in program
• Little customer insight to plan assessment call

Optimal Lifecycle of Care

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### Business Applications: Right Lead Generation

*More sophisticated use of segmentation and predictive modeling can be used to improve lead generation resulting in higher close rates*

#### Business Value

- Improved sales force effectiveness
- Reduced sales cycle for “high close” probability groups
- Improved market position and communication of value proposition
- Reduce marketing and sales spend

#### Our Approach

- Build a predictive modeling application based on external business, census and commercial credit data
- Use application to:
  - Qualify leads upstream
  - Prioritize leads
  - Develop different value propositions for different groups

#### Steps to Realize Opportunity

- Analyze historical lead and sales data
- Build predictive modeling application using external data sources and apply to historical sales data to identify characteristics that signal a greater likelihood of sale
- Integrate predictive model within sales/CRM systems to score leads and prioritize sales efforts based on predictive model scores
Benefits to Health Plans
Segmentation Can Unlock Significant Business Value

**Customer segmentation can decrease costs while developing more innovative products**

- Sophisticated targeting and campaigning
- Increased engagement in and compliance with medical management programs
- Improved retention of profitable members

**Shift the medical cost curve**

**Improved Acquisition, Engagement and Retention**

- Acquisition, retention and outreach effectiveness
- Clinical intervention and health education effectiveness
- Customer service personalization and tiering

**Lower administrative expenses**

**More Efficient Allocation of Resources**

- New product development and launch
- Provider collaboration to improve outcomes
- Community partnerships to improve public health

**Develop consumer-focused innovations**
Questions & Answers
About Us

Mo Masud, Hartford, CT
A Senior Manager in Deloitte’s Advanced Quantitative Services Practice, with over 13 years of health insurance, technology and predictive modeling experience. Areas of expertise include: healthcare predictive modeling for private and public sector insurance, healthcare regulatory reporting, clinical expert systems and technical implementation and integration of predictive modeling applications. Mo has led numerous engagements of implementation of large scale predictive modeling and custom technical applications for public and private integrated healthcare delivery networks and insurers that helped improve quality and continuity of care. Prior to his tenure in the consulting field, he held several data analysis positions with Empire Blue Cross Blue Shield in New York City including the management of Empire’s corporate wide Health Data Analysis and Reporting Group.

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