Session 41PD, Is it Time to Review Your Trend Model?

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2018 Health Meeting
Session 41
Is It Time to Update Your Trend Model?

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Is it time to review your trend model?

• Is your current model accurate enough?

• Are you anticipating major changes that may impact future results?

• Can you answer key stakeholder questions?

• Can you explain why your results look the way they do?

• Can you identify actionable items to lower future costs?
The Trend Process

- Model
- Select
- Improve
- Analyze
- Monitor

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A Structured Approach to Projecting Trends

Model

Improve
Select
Analyze
Monitor
# Types of Trends

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Passive Renewal Trend (Pricing Trend)** | • The trend the underwriter uses assuming no major changes to a group  
• Same general concept used for manual rates  
• Often hard-coded into rating systems  
• Calculation depends on underlying rating process  
• *The focus for this presentation* |
| **Financial** | • Done at a book or organizational level  
• External  
• Subject to applicable accounting rules  
• Includes buy-downs, program changes, etc. |
| **Budget** | • Internal  
• More flexibility in assumptions |
The Data

• **Data sources**
  • Statistical system
    • Eligibility and claims data at the member/claim level
    • The main source of information
  • Value-based reimbursement penalties and bonuses
    • Often a separate system
    • Should be incorporated into trend calculation as appropriate
  • Lawsuits/settlements
    • In financial data, but rarely in statistical system
    • Materiality varies
  • Plan design and program availability data
    • May or may not be available, but extremely useful when it is

• **Data types**
  • Stable/continuous
  • All groups
Can You Rely on Past Experience?

At first blush it appears that there has been a major improvement in trend projections for POS plans in the last few years.

Source: Segal Multi-Employer Survey
But Wait...

- Pharmacy trends have been more erratic
- In part, the surge in trends was due to the introduction of Hep C drugs

Sources: Segal Multi-employer Survey
## Components of Passive Renewal Trend

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core unit costs</td>
<td>• Cost increases assuming steady state</td>
</tr>
<tr>
<td>Core utilization</td>
<td>• Core utilization assuming steady state</td>
</tr>
<tr>
<td>Structural changes</td>
<td>• Changes due to clinical programs, medical policy or benefit design</td>
</tr>
<tr>
<td></td>
<td>• Introduction/Increase in value-based plans</td>
</tr>
<tr>
<td>Population shifts</td>
<td>• Changes in cost due to population shifts not captured in rates</td>
</tr>
<tr>
<td>One-time changes</td>
<td>• Changes not expected to recur, excluding structural and population shifts</td>
</tr>
</tbody>
</table>

- Most components are calculated at a book-of-business basis
  - Book is usually defined as Medicaid, Medicare, Exchange Business, National Accounts, etc.
  - Some adjustments may be made at the state or market level
Cost Index Example

<table>
<thead>
<tr>
<th>Service</th>
<th>Weight</th>
<th>Cost in 2017</th>
<th>Cost in 2018</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service 1</td>
<td>40%</td>
<td>$75</td>
<td>$85</td>
<td>13%</td>
</tr>
<tr>
<td>Service 2</td>
<td>25%</td>
<td>$90</td>
<td>$100</td>
<td>11%</td>
</tr>
<tr>
<td>Service 3</td>
<td>20%</td>
<td>$125</td>
<td>$130</td>
<td>4%</td>
</tr>
<tr>
<td>Service 4</td>
<td>15%</td>
<td>$150</td>
<td>$155</td>
<td>3%</td>
</tr>
<tr>
<td>Combined</td>
<td>100%</td>
<td>$100</td>
<td>$108</td>
<td>8%</td>
</tr>
</tbody>
</table>

- Often the major trend driver
- Market basket concept, like a consumer price index
  - Keep weights the same, change costs
- Costs should be on an all-in basis
  - Include stop-loss provisions, penalties, bonuses
- Historical rates based on experience, but projected should reflect contract changes
Core Unit Costs

- **Cost index**
- **Severity**
  - Can be measured directly – DRG weight per admit
  - Historical trend projections also possible
- **Mix**
  - Includes product, providers etc.
  - Can use weighting approach, but often messy
  - Can calculate as a balancing item
- **Leveraging**
  - Allowed increases, cost-share/limit stays constant
    - Increases trend when cost-share is constant
    - Decreases trend if a limit/maximum
  - Generally straightforward calculation. Exception: Stop-loss
Core Utilization

• Often the most volatile component of trend

• Economic factors
  • Key drivers include unemployment, disposable income
  • Econometric models often useful

• Clinical changes
  • Generally includes gradual changes in practice, like the adoption of a new clinical guidelines
  • Technology curve
    • New drugs generally have quick impact
    • Some surgeries may see a “surge”

• Work-days
  • Most scheduled procedures are done during the week
  • Holiday schedules matter
  • Ideally, use 7 years experience
  • Alternatively, determine weights by day of week and measure impact based on calendar
Structural Changes, One-Time Changes, Population Shifts

• **Structural changes**
  - Includes changes due to clinical programs, medical policy or benefit design
  - Most changes known in advance
  - Projection factors include actuarial value, price elasticity, selection

• **Population shifts**
  - Typically age-sex, geographic changes not captured in rates
  - Risk profile – what can we learn from ACA risk pool analysis history?

• **One-time changes**
  - Some known in advance – legislative changes, etc
  - Some not – flu season, etc.
Always Keep in Mind

• What happens in Washington does not stay in Washington
  • Cost-shifting
  • Eligibility rules for programs may impact risk pools

• Value-based reimbursement trends
  • Need to account for bonuses/penalties
  • Do not always save money

• Behavioral finance
  • Often counter-intuitive
  • Watch out for benefit rush/benefit delay and other timing differences
Best Practices

• **Consistent communications**
  • Internal memo or presentation
  • Key assumptions
  • Run-rate analysis
  • Recast/Actual to expected analysis

• **Maintain summary level statistics**
  • Long term – 10 years or longer
  • Use for projections/reasonableness testing
  • Understand sudden shifts in experience
  • Include projections and actual results
Selecting the Final Trend

- Select
- Model
- Improve
- Analyze
- Monitor
# Know Your Audience

<table>
<thead>
<tr>
<th>Book of Business</th>
<th>Internal Focus</th>
<th>External Focus</th>
</tr>
</thead>
</table>
| Small Group/Manual Rates  | • Actuarial Department  
                            • Market Level Senior Management
                            • Finance, Sales, U/W  
                            • Product, Clinical       | • Policyholders/Consumers
                            • Regulators               |
| Experience-Rated Groups   | • Actuarial Department  
                            • Market Level Management
                            • Finance, Sales, U/W  
                            • Product, Clinical       | • Policyholders/Consumers
                            • Regulators               
                            • Brokers/Consultants     |
| ASO                       | • Actuarial Department  
                            • Finance, Sales, U/W  
                            • Product, Clinical       | • Brokers/Consultants
                            • Policyholders/Consumers
                            • Human Resources
                            • Finance                  |

- Everyone cares about costs/affordability/rate increases – out-of-scope for today
- Risk is personal
## Risk Approaches

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>Emerging</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Statistic</strong></td>
<td>• High Cost Claimants PMPM</td>
<td>• Total PMPM</td>
</tr>
<tr>
<td><strong>Stop-loss Analogy</strong></td>
<td>• Specific stop-loss</td>
<td>• Aggregate stop-loss</td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
<td>• Existing infrastructure&lt;br&gt;• Widely-accepted&lt;br&gt;• Explains most of the risk</td>
<td>• More complete picture of risk&lt;br&gt;• Better analytics</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>• Limited analytics</td>
<td>• New concept, communications key&lt;br&gt;• Infrastructure may have to be built</td>
</tr>
</tbody>
</table>

- A two-track approach may be the best solutions
Most High Cost Claims Are Episodic in Nature

- There is roughly a 50/50 chance that a person who is a high-cost claimant in year 1 will be a high-cost claimant in year 2
- Most high cost claimants have no prior indications – no previous claims, low risk score, etc.
- For example, a typical knee replacement surgery episode lasts 3 to 4 months
Case Study 1

- The high-cost claims for an experience-rated group are 10% higher than expected. Should this group be rated up?
The Premise Behind the Emerging Approach

• There is a 50-50 chance that a group will beat trend after adjusting for known changes like population and structural changes
• Most components of trends like unit costs and core utilization are not unique to the group or can be normalized
Case Study 2

- Manual rates for a 20,000 member market
- Projected best estimate PMPM for 2019 = $300
- Standard Deviation = 5%
Scenario 1: Price at Best Estimate + 2% Margin

- Probability of payout = 34%
- Expected profit/loss = $6 PMPM or $1.4 million
- Probability of losing more than $1 million - 24.8%
- Probability of losing more than $5 million - 3.6%
Scenario 2:  Price 2% Under Best Estimate

- The miss may be intentional (generate new business), imposed by regulators or unintentional
- Measures risk if the best estimate was off by 2%; priced at $294 PMPM, but actual was $300
- Expected loss = $6
Best Practices

• **Test, test, test**
  • Key variable is the variance, which can be determined by experience, Monte Carlo, Bootstrapping, etc.

• **Practice communications**
Monitoring Experience

- Model
- Select
- Improve
- Analyze
- Monitor
Historical Experience Breakdown

Historical Medical Allowed Trend

Historical Trend Component
Pricing Model Components

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Historical vs. Prospective Trends

Historical Medical Allowed Trend

- Unit Cost: Total 2.7%
  - Unit Price: Fac 3.8%
  - Util. Fac 1.2%
  - Util. Prof -0.7%
  - Mix/Severity 3.2%
  - Ageing 0.1%
  - Churn 1.0%
  - OBSERVED 5.9%
  - Norm: Aging -2.7%
  - Norm: Churn -1.0%
  - NORMALIZED 2.7%

Utilization: Total 0.6%

Projected Medical Trend

- Unit Price 4.1%
- Utilization 1.4%
- Mix/Severity 1.0%
- One-time 0.5%
- PROJ. ALLOWD 7.1%
- Leveraging 0.7%
- PROJ. PAID 7.9%
- Buy-downs -1.0%
- Cust/Prod Mix -0.5%
- Other -0.2%
- NET FORECAST 6.1%
Actual vs. Expected: Total

(Normalized!) Medical Allowed PMPM

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual Trend</th>
<th>Expected Trend</th>
<th>Act. PMPM</th>
<th>Exp. PMPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hist Y1</td>
<td>2.9%</td>
<td>2.9%</td>
<td>$300.0</td>
<td>$300.0</td>
</tr>
<tr>
<td>Hist Y2</td>
<td>1.7%</td>
<td>1.7%</td>
<td>$310.0</td>
<td>$310.0</td>
</tr>
<tr>
<td>Hist Y3</td>
<td>5.4%</td>
<td>5.4%</td>
<td>$320.0</td>
<td>$320.0</td>
</tr>
<tr>
<td>Hist Y4</td>
<td>2.8%</td>
<td>2.8%</td>
<td>$330.0</td>
<td>$330.0</td>
</tr>
<tr>
<td>Proj</td>
<td>5.1%</td>
<td>5.1%</td>
<td>$340.0</td>
<td>$340.0</td>
</tr>
</tbody>
</table>

Chart shows Actual vs. Expected Medical Allowed PMPM, with actuals and expecteds for Hist Y1 to Proj years.
Actual vs. Expected: by Component

Medical Allowed Trend by Component

- **TOTAL**: 4.5% (Actual), 5.8% (Expected)
- **Unit Price**: 3.8% (Actual), 3.6% (Expected)
- **Utilization**: 0.0% (Actual), 1.2% (Expected)
- **Mix/Severity**: 0.7% (Actual), 1.0% (Expected)
Actual vs. Expected: Utilization by Category

**Actual vs. Expected Utilization Trends**

- **TOTAL**
  - Actual: 0.0%
  - Expected: 1.2%

- **IP**
  - Actual: 0.0%
  - Expected: 1.0%

- **OP**
  - Actual: 1.4%
  - Expected: 1.0%

- **ANC**
  - Actual: 3.7%
  - Expected: 2.5%

- **PR**
  - Actual: 1.0%
  - Expected: 1.0%

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Actual vs. Expected: Now What?

Considerations:

1. Consistent vs. One-time Miss
   - Importance of tracking actual & expected trends over time
   - Are we always high on utilization? Are we consistently off, but +/-? Are we usually pretty accurate but were off just this year?

2. Predictable vs. Unforeseeable Events

3. Margin – Implicit vs. Explicit

4. Model Sophistication
   - Ability/resources to develop model components (e.g., cyclical nature of utilization might require years of historical experience you don’t have)

5. Pricing Strategy
   - Stability vs. Accuracy in a cyclical environment

6. Business Priorities
   - Cost/benefit evaluation of additional precision (e.g., may require a big investment to develop an effective mix/severity projection model; if historically the impact is always between -0.2% & +1.5% ...)
The Next Level

- Model
- Select
- Improve
- Monitor
- Analyze
Taking Trend Analysis to the Next Level

**PREDICT**

- Improve
- Analyze
- Monitor
- Select
- Model

**Analytical Building Blocks**

- Analytical Expertise
- Healthcare Knowledge

**IMPACT**

Cost Saving Actions
Take Advantage of Your Data

Analytical Building Blocks

- **Population Characteristics**
  - Age, Gender, Risk Score

- **Components of Cost**
  - Unit price, Util, Mix/Severity

- **Medical Cost Categories**
  - IP/OP/PR/RX & Sub-categories

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Identifying Action Items

**WHAT**
...is the problem?

START BROAD
Utilize standard trend/benchmark reporting to quickly identify areas of focus

How do you know what areas to look more closely at?

**WHY**
...is it happening?

DIG IN
Develop more detailed reports to get to true drivers of experience

What are effective cuts of your data?
What reports are useful to have on-hand?

**HOW**
...can we impact it?

GET SPECIFIC
Use business & healthcare knowledge to dig to the actionable level

What can you impact?
What are you looking for?

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Inpatient Example: Start Broad

Typical Trend View

<table>
<thead>
<tr>
<th>Medical Cost Category</th>
<th>Allowed $ PMPM</th>
<th>Admissions / K</th>
<th>Allowed $ / Admission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Annual Amts</td>
<td>Trends</td>
<td>Annual Amts</td>
</tr>
<tr>
<td></td>
<td>Y2</td>
<td>Y3</td>
<td>Y2/Y1</td>
</tr>
<tr>
<td>Inpatient Acute</td>
<td>$99.20</td>
<td>$105.51</td>
<td>3.1%</td>
</tr>
<tr>
<td>Medical</td>
<td>$30.06</td>
<td>$31.65</td>
<td>3.7%</td>
</tr>
<tr>
<td>Surgery</td>
<td>$50.20</td>
<td>$54.16</td>
<td>3.3%</td>
</tr>
<tr>
<td>Labor&amp;Delivery</td>
<td>$9.52</td>
<td>$9.71</td>
<td>1.6%</td>
</tr>
<tr>
<td>Newborns</td>
<td>$5.06</td>
<td>$5.28</td>
<td>0.8%</td>
</tr>
<tr>
<td>MH/SA</td>
<td>$3.67</td>
<td>$4.01</td>
<td>3.4%</td>
</tr>
<tr>
<td>Other/Ungrp.</td>
<td>$0.69</td>
<td>$0.70</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

Additional detail often measured for Acute Inpatient:
- Days / K, ALOS, $ / Day
- Readmission rates
- DRG weight (severity measure)
Inpatient Example: Dig In / Get Specific

Readmission Metrics (by sub-population) +
Measurable elements of Transition of Care program

![Graph showing readmission rates for different populations](graph.png)
# Top Readmission DRGs

Better understand nature of readmissions

## Top 10 30-day Readmission DRGs

<table>
<thead>
<tr>
<th>Readmission Description</th>
<th>% Readmits</th>
<th>% Readmit $</th>
<th>Avg Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 10*</td>
<td>26.6%</td>
<td>17.3%</td>
<td>$16,080</td>
</tr>
<tr>
<td>Psychoses</td>
<td>4.8%</td>
<td>1.8%</td>
<td>$9,380</td>
</tr>
<tr>
<td>Postoperative &amp; Post-Traumatic Infections</td>
<td>4.1%</td>
<td>4.1%</td>
<td>$24,910</td>
</tr>
<tr>
<td>Alcohol/Drug Abuse Or Dependence</td>
<td>3.5%</td>
<td>0.8%</td>
<td>$5,320</td>
</tr>
<tr>
<td>Septicemia Or Severe Sepsis</td>
<td>3.5%</td>
<td>3.2%</td>
<td>$22,640</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>2.6%</td>
<td>2.1%</td>
<td>$19,920</td>
</tr>
<tr>
<td>Disorders Of Pancreas Except Malignancy</td>
<td>2.2%</td>
<td>1.7%</td>
<td>$18,960</td>
</tr>
<tr>
<td>Simple Pneumonia &amp; Pleurisy</td>
<td>2.0%</td>
<td>1.2%</td>
<td>$14,700</td>
</tr>
<tr>
<td>Misc Disorders Of Nutrition, Metabolism, Fluids/Electrolytes</td>
<td>1.5%</td>
<td>0.7%</td>
<td>$12,180</td>
</tr>
<tr>
<td>Disorders Of Liver Except Malig, Cirr, Alc Hepa</td>
<td>1.3%</td>
<td>0.9%</td>
<td>$17,180</td>
</tr>
<tr>
<td>Complications Of Treatment</td>
<td>1.1%</td>
<td>0.8%</td>
<td>$17,730</td>
</tr>
</tbody>
</table>

*Exclude labor/delivery and chemotherapy*
Inpatient Example: Dig In / Get Specific

Readmission Metrics (by Facility)
Inpatient Example: Gap of Analysis

1. Admissions trend is an area of focus

2. Readmissions are impactable
   - Transition of Care best practices (joint Provider/Facility ownership)
   - Inpatient Safety Protocols (Facility ownership)

3. Comparing readmission metrics shows what is achievable
   - Top performing sub-populations / facilities

4. Next Steps / Action items:
   - Learn more about differences by population/facility (where rates are low – what is being done differently?)
   - Share (specific) information with providers in value-based arrangements
   - Enhance / invest in real-time data support for care managers
   - Consider limiting your network
References

  - Ch. 34, Medical Claim Cost Trend Analysis
- [https://axenehp.com/actionable-vs-actuarial-data/](https://axenehp.com/actionable-vs-actuarial-data/)
Q&A