Session 138 PD, Streamlined Underwriting and Product Development: Good, Fast and Cheap? Can I Get More than Just Two of Three?

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Presenters: Gregory A. Brandner, FSA, MAAA
           Sean J. Conrad, FSA, MAAA
           Lisa Hollenbeck Renetzky, FSA, MAAA
Streamlined Underwriting and Product Development

Good, Fast, and Cheap? Can I get more than just two out of three?
Basic Rule of Manufacturing

Fast, Cheap, Good – Pick Two.
Polling Question #1 - What is Streamlined Underwriting? Please choose one

1. The same as Simplified Issue, just the latest buzzword
2. Similar to Simplified Issue, but with more electronic underwriting evidence, predictive models and available up to higher face amounts
3. A more automated underwriting process that should result in close to fully underwritten mortality
Polling Question #2 - Which of the following best describes your company’s level of activity with regard to streamlined/automated underwriting? Please choose one

1. Already have an automated underwriting process in place
2. Decision to automate has been made; working on implementation
3. Looking into it, but no decision has been made
4. No interest; satisfied with current process

- Option 1: 25%
- Option 2: 20%
- Option 3: 48%
- Option 4: 8%
How to move toward Good, Fast and Cheap?

What we will accomplish

- Data Sources and Uses
- Management Information
  - Case Study examples
- Product Development Considerations
Data Sources and Uses
Fast + Cheap but still Good?

“In God We Trust”, Everyone Else Bring Data

- Examples of Data currently available
  - Prescription histories
  - MVR
  - MIB
  - Identity
  - Credit
  - Insurance Activity Index
  - Tax/Asset Data
  - Inspection reports
  - Inforce policyholder information
  - Third party marketing
How is data currently used?

**Within Streamlined Underwriting/Simplified Issue**

- Underwriting
  - MIB, MVR, Rx common in SU/SI
  - May be anti-selected against without it
  - More information is becoming available

- Target Marketing
- Build Predictive Models
  - Propensity to buy
  - Lab scores
- Manage Inforce
- Management Information
  - Build important feedback loop
Management Information
Polling Question #3 - For your Streamlined Underwriting/Simplified Issue program, do you? Please choose all that apply

1. Electronically store application and drill down data
2. Electronically store underwriting information
3. Electronically store underwriting decisions
4. Create pivot tables/reports with this information
5. Analyze the results
6. Provide feedback to improve the process
Polling Question #4 - For which of the following do you have an established monitoring process and feedback loop to improve your SU/SI process? Choose all that apply

1. Application status (Issued, Declined, Not Taken, etc.)
2. Application and drill-down answers
3. Third party database results (Rx, MVR, MIB, Identity, Credit results, etc.)
4. Customer demographics (Gender, Age, UW class, etc.)
5. Policy characteristics (product, face amount, etc.)
6. Agent quality measures
7. Process analytics (time to complete application, % RUW, % of applications completed, etc.)
8. Post issue audits of underwriting (APS, interview, etc.)
Why should I worry about monitoring underwriting results?

How long until I get feedback on mortality?

- Example exhibits experience differential between SI and Fully Underwritten mortality assumptions
- Many years of sales can accumulate before mortality results may be credible and actionable even on SI
- Use early underwriting feedback to adjust program

<table>
<thead>
<tr>
<th>Accumulated Claim Count</th>
<th>5 years of New Business - 2000 Policies Issued per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>1</td>
</tr>
<tr>
<td>Full Underwriting</td>
<td>0</td>
</tr>
<tr>
<td>Simplified Issue</td>
<td>1</td>
</tr>
</tbody>
</table>
Management Information

Keys to Success

- Consistency and quality of data
- Real time reporting
- Real time auditing (high level system checks)
- Create reports that can be monitored regularly
- Establish resources with responsibility for monitoring
  - Within the business line
  - Within IT
- Establish process for considering and implementing changes
- Clear communications with Senior Management
Items to monitor

- Application status (Issued, Declined, Not Taken, etc.)
- Process measures (time to complete application, % RUW, % of applications completed, etc.)
- Application and drilldown details (any yes answers)
- Third party database results
  - Rx Results (No Hit, Hit – No Drugs, Hit – With Drugs)
  - MIB results (including IAI hits)
  - Etc.
- Customer demographics
- Policy characteristics
- Agent quality (% NS/SM, % STP, % No hits, early lapse and claims experience)
- Distribution channel (Mail, online, captive agent, broker)
- Cause of death (are there holes in the application?)
- Rescissions
Offering higher face amounts than are needed in a target market can lead to anti-selection.

Overlap with a fully underwritten product can also produce unusual distributions.

Case Study 1 – Track Distribution of Sales by Size Band

Is maximum size appropriate for target market and underwriting?

- Offering higher face amounts than are needed in a target market can lead to anti-selection
- Overlap with a fully underwritten product can also produce unusual distributions
Case Study 2 – Interview Disclosures by Agent

Agent Monitoring

- Problems
  - Information on applications (especially answers to interview questions) can be falsified
  - Agents may sometimes actively encourage insurance fraud
  - Agents may not fully understand the new underwriting process

- Approach:
  - Analyze quantifiable outcomes against interview disclosures
  - Analyze cases and trends by agent to look for agent driven anti-selection

- Benefits
  - Faster and more proactive fraud detection → more favorable mortality results
Agent Monitoring

Disclosures - Example

Interview Disclosures by Agent
Agent Monitoring
Acceptance “Actual / Expected”
Expected is Average for all agents

*Note: agents with less than 25 cases have been excluded from this display
Case Study 3 – Pharmaceutical Database Results

Distribution of Rx Scores

- What percent are not found; no hits; declines?
- Does the distribution make sense? By age?
- Should underwriting rules be adjusted?
Case Study 4 – Smoker Prevalence

Smoker/Nonsmoker

- Fully underwritten product has 80% non-tobacco; 20% tobacco
- New Simplified Issue band has 90% non-tobacco; 10% tobacco

- If 50% of the tobacco users are in the non-tobacco class
  - Non-tobacco mortality is now 11% higher
  - Example assumes total difference in distribution is from non-disclosure
  - Assumes tobacco mortality is 200% of nontobacco and very simple math

- Profit Margins
  - Assumes tobacco mortality is 200%; tobacco term premiums are 2x non-tobacco; expenses are 3% premium

<table>
<thead>
<tr>
<th>Profit Margins</th>
<th>Tobacco Non-Disclosure %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2% base</td>
<td>5%</td>
</tr>
<tr>
<td>90%</td>
<td>1.6%</td>
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<tr>
<td>85%</td>
<td>1.4%</td>
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<tr>
<td>80%</td>
<td>1.2%</td>
</tr>
<tr>
<td>75%</td>
<td>1.0%</td>
</tr>
<tr>
<td>70%</td>
<td>0.9%</td>
</tr>
<tr>
<td>60%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>
Recent Article from Journal of Insurance Medicine

- Analysis of insurance interviews and urine cotinine results
- “Fully Underwritten” life insurance sale
- 19.3% of Cotinine Positive Tests were Self-Reported as Non-Users of Tobacco

“Demographic Predictors of False Negative Self-Reported Tobacco Use Status in an Insurance Applicant Population”
James Palmier, MD, MPH, MBA; Brian Lanzrath, MBA; Ammon Dixon, MAOA; Oluseun Idowu, PhD
Journal of Insurance Medicine, December 11, 2013
Used with permission.
Data Analysis to Monitor Tobacco Disclosure

- Prescription Histories may identify smoking cessation products
- Monitor Tobacco/Non-tobacco distributions
  - Compare to fully underwritten overall, by age, by face amount
- Monitor Tobacco/Non-tobacco distributions by agent
- Consider target market in identifying expected distributions
Lab Values and Self Disclosure

Exam One Life Insurance Data

Applicant Distribution and Admitted Diabetes by Serum Glucose:
All Adults, 2010-2013

<table>
<thead>
<tr>
<th>Category</th>
<th>Range</th>
<th>Reported Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Glucose</td>
<td>&lt;110 mg/dL</td>
<td>2.0%</td>
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<tr>
<td>Impaired Glucose Tolerance</td>
<td>110-125 mg/dL</td>
<td>16.7%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>&gt;125 mg/dL</td>
<td>46.4%</td>
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</tbody>
</table>

Used with permission.
Lab Values and Self Disclosure

Exam One Life Insurance Data

Applicant Distribution and Admitted Diabetes by Hb A1c: All Adults, 2010-2013

<table>
<thead>
<tr>
<th>Category</th>
<th>Range</th>
<th>Reported Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal A1c</td>
<td>&lt;6.0%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Impaired Fasting Glycaemia</td>
<td>6.0-6.4%</td>
<td>8.8%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>≥6.5%</td>
<td>53.8%</td>
</tr>
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</table>

Used with permission.
Lab Values and Self Disclosure

Exam One Life Insurance Data

Applicant Distribution and Admitted High Blood Pressure by Systolic BP:
All Adults, 2010-2013

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<thead>
<tr>
<th>Category</th>
<th>Range</th>
<th>Reported HBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>6.8%</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139</td>
<td>21.4%</td>
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<tr>
<td>Stage 1 HPB</td>
<td>140-159</td>
<td>41.8%</td>
</tr>
<tr>
<td>Stage 2 HPB</td>
<td>≥160</td>
<td>50.0%</td>
</tr>
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Product Development Considerations
Planning your Product

**Thoughts during product development**

- Consider target market and distribution
  - Price sensitivity, underwriting process, policy sizes, competition
- Don’t compete with fully underwritten product
  - Overlap will be exploited
- Front end (underwriting) expense may be lower, but back end (mortality) expenses may be higher
- Considerations with riders
  - Chronic illness – need very specific underwriting information – questions on ADL’s
- Prepare your claims adjudication
- As you innovate, talk with partners
- Create feedback loop to improve processes and results
Thank you for your attention.
Holy grail = streamlined/nonmed underwriting process with premiums equivalent to fully underwritten product

Agenda:
- SI mortality experience
- Drivers of increased mortality
- Ways to shrink mortality differential
- Case studies
SI mortality experience is significantly higher than for full underwriting (FUW)

- Major difference for SI protection vs. accumulation products
  - SI protection products 2-4x higher mortality than FUW
  - SI accumulation products 50-100% higher mortality than FUW

- Differential of SI vs. FUW mortality reduces over time, but still 3-5 tables for protection products over a pricing horizon
What is the biggest driver for SI mortality being higher than traditional FUW mortality?

1. Socioeconomics of the insureds
2. Non-disclosure (smoking, medical, etc)
3. Higher level of anti-selective lapses
4. Not attracting enough healthy lives
5. Other
Mortality experience – GI COLI vs. Full Underwriting

…but mortality for GI COLI is lower than fully underwritten traditional business

[Bar chart showing relative mortality: Traditional (Full UW) vs. GI COLI]
So what’s different?

Comparing individual SI business to GI COLI

- Anti-selection at issue
- Smoking & other non-disclosure (incentive to lie)
- Selective lapses
- Socioeconomics (middle market vs. white collar executives)
  - differences in smoker prevalence, access to healthcare, obesity, etc
- Difficulty attracting/keeping healthy lives
Anti-selection and impaired risks slipping through UW contribute to the increase in SI mortality relative to FUW.

What % increase in mortality would you associate with higher anti-selection and additional impaired risks?

1. < 2%
2. 3-5%
3. 6-10%
4. 11-20%
5. > 20%
Not many would argue that a streamlined UW process is going to open up the possibility for increased anti-selection and/or that some impaired lives will slip through.

But it doesn’t take much extra mortality to significantly increase experience on a % basis, especially for younger ages & early durations.

The table below shows the impact that 1 additional death per 1000 has on the PV of mortality over 1, 5, and 30 years.

<table>
<thead>
<tr>
<th>Impact of 1 Additional Death</th>
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<td>25</td>
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<td>55</td>
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<td>65</td>
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</table>
Ways to Shrink Mortality Differential

- Minimize smoker non-disclosure (e.g., targeted post issue audits)

- Competitive premiums to attract/keep healthier risks

- Measure/monitor socioeconomics and benchmark to fully UW business
  - when comparing mortality, make sure it is “apples to apples”

- Improve persistency (e.g., commission structure, predictive modeling, process improvements)

- Monitor/influence agent behavior, avoid poor risks
What worked well?

- Competitive premiums do attract/keep more healthy lives; offering one or more ‘preferred’ classes also helps
- UW Triage - limiting the streamlined process to only the best risks, full UW for the rest
- Active claims management
- Post-issue monitoring
- Robust use of 3rd party data
- Limiting offer to “closed” groups (e.g., affinity groups; mortgage term, etc); not wide open
- Return of Premium to encourage healthy risks and lower lapse rates
- Adapt product/process as you learn
- Quick/efficient new business process
What didn’t work?

- A few poor distribution sources that exploit the process/product can distort the overall mortality & persistency experience
- Believing that non-med mortality will equal full UW mortality; insurer needs to use other levers to meet price/profit targets
- Distribution buy-in to new process
- Stability/longevity to the offering (product pulled before it had a chance to gain traction)
- Not actively monitoring the business
- Over-reliance on automated processes (not auditing to ensure results are as expected)
STREAMLINED UNDERWRITING AND PRODUCT DEVELOPMENT: GOOD, FAST, CHEAP – CAN I GET MORE THAN TWO OF THREE?

SOA Annual Meeting
October 28, 2014

Gregory Brandner, FSA, MAAA
Assistant Vice President & Actuary
Better, simpler, faster, but . . .

- As close to fully underwritten mortality as possible
- Simple, fast, non-invasive, straight-through-processing, etc. is great, but . . .
- Price is always important
Poll Question

You have decided to purchase a $250,000 twenty-year term policy. Your premium will be $30/month for a fully underwritten policy (paramed exam, blood profile, urine specimen, possible APS, decision in 4-8 weeks).

How much more would you be willing to pay for the speed and convenience of a streamlined underwriting process (no paramed, no fluids, immediate decision)?

1. $0.00
2. $1.50
3. $3.00
4. $6.00
PRICING
Poll Question

Can a streamlined automated underwriting program achieve the same level of mortality as current fully underwritten programs?

1. Yes, we are there today
2. Yes, but it’s still 5 years down the road
3. Yes, but it’s still 10 years down the road
4. No, automated underwriting programs will never achieve fully underwritten mortality
What do we mean by “as close to fully underwritten mortality as possible”?

**Assuming no shift in distribution**

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<thead>
<tr>
<th>Fully Underwritten</th>
<th>Streamlined Underwriting</th>
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<td><strong>Distribution</strong></td>
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<tr>
<td>Super Pfd</td>
<td>40</td>
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<td>Pfd</td>
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<td>Std Plus</td>
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The “open market” effect

Assuming no shift in distribution

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<td>Std</td>
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After adjusting for defectors

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<tr>
<td>Std</td>
<td>100</td>
<td>106%</td>
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Mortality

. . . And more defectors

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<tr>
<td>Std</td>
<td>100</td>
<td>109%</td>
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Plus some immigrants

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<td>160%</td>
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<th>Relative Mortality</th>
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</thead>
<tbody>
<tr>
<td>Std</td>
<td>100</td>
<td>120%</td>
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</table>
Can you include one (or more) preferred risk classes?

Include a preferred risk class

<table>
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<th>Distribution</th>
<th>Relative Mortality</th>
</tr>
</thead>
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</tbody>
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<table>
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<th>Risk Class</th>
<th>Distribution</th>
<th>Relative Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pfd</td>
<td>70</td>
<td>81%</td>
</tr>
<tr>
<td>Std</td>
<td>30</td>
<td>143%</td>
</tr>
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</table>
Preferred criteria

Medical history
BMI
Family history
Rx history / compliance
MVR history
Self-reported blood pressure
Self-reported cholesterol
Other??
Best practices: Mortality

Increased mortality
- No fluids
- No paramed
- No APS
- Non-disclosure
- Loss of sentinel effect

Decreased mortality
- Tele-underwriting
- App quality
- Electronic DBs
- Business Analytics
- Predictive modeling

- Target market
- Distribution
- Marketing approach
For those who use automation in your process, which tool(s) are you using as part of your rules engine?

1. MIB
2. MVR
3. Rx
4. fraud check
5. lab score
6. Credit score
7. Other

Poll Question

[Bar chart showing percentages for each option]
BUSINESS ANALYTICS – A CASE STUDY
Top reasons why cases were referred to an underwriter

Refer to UW

- MIB Code: 24.5%
- Prescription Drug Use: 20.8%
- Hospital Stay: 14.7%
- Motor Vehicle Records: 13.5%
- Current Employment: 10.4%
- Public Records: 7.3%
- Criminal Activity: 4.9%
- Occupation: 1.2%
- Insurance Application Declined: 1.2%
- Anxiety: 0.9%
- Other: 0.6%

Other
Top reasons why cases were referred to an underwriter for a single impairment

- MIB Code: 29.2%
- Prescription Drug Use: 18.0%
- Motor Vehicle Records: 10.4%
- Hospital Stay: 9.0%
- Employment: 8.1%
- Public Records: 4.3%
- Criminal Activity: 4.1%
- Occupation - Aviation: 3.6%
- U.S. Citizen: 2.5%
- Anxiety: 2.3%
- Other: 8.4%
Top reasons why cases were referred to an underwriter for a **single impairment**

Refer to Underwriter for self-reported hospital stay

- **Chest Pain**: 22%
- **Gallstones**: 18%
- **Asthma**: 16%
- **Kidney Stones**: 16%
- **Childbirth**: 12%
- **Vertigo/dizziness**: 9%
- **Other**: 7%

56
The future of streamlined underwriting:
A few thoughts, observations, and predictions

Thoughts and observations:

Easy to see how it should be done; not nearly so easy to do

New data sources will help

Effective use of Business Analytics is essential

Predictive modeling

Some distribution channels work better than others

Be prepared to make adjustments – you won't get it right the first time
The future of streamlined underwriting:
A few thoughts, observations, and predictions

Predictions:

As an industry we will get to fully underwritten pricing using streamlined automated underwriting

If we don’t figure it out, somebody else will
THANK YOU FOR YOUR ATTENTION