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Actuarial Support for Underwriting 2007 Health Spring Meeting June 13, 2007 Session 6

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Actuaries and Underwriters: Stereotypical Extremes

Actuaries are typically...

- Conservative
- Analytically accurate but precision seeker
- Medium to long term focus and action oriented, limited urgency
- Financially result oriented/biased
- Program oriented
- Number persons with some people interactions, shy, quiet

Underwriters are typically...

- Moderate to Conservative
- Analytically accurate but flexible
- Short to medium term focus, responsive and fast paced action oriented
- Balancing financials with growth
- Customer oriented
- People persons with a Numerical focus, approachable, conversationalists

Actuaries and Underwriters: Successful Partnership

A few issues that impact successful partnership...but do not need to:

- Reporting relationship
- Leadership personality
- Clearly defined levels of responsibility and case review
- Respect for partner's skill sets

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Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Include U/W leadership in the rate development process
 - Action: Do not create rates in a vacuum. Understand the marketplace by engaging U/W in discussion prior to rating action. Be especially aware of "optics" on certain rating variables as well as what is included in standard presentations by U/W and Sales to customers.
 - Action: Provide talking points for rating changes.
 - Action: Communicate in terms that underwriters can understand and provide the necessary training and information to U/W leadership and staff to enable underwriters to fully understand the drivers of the rates and thus help them to explain reasons for the results.

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Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Appreciate the pressures on Underwriters who are continually “on call” for Sales/Brokers who are trying to sell at the “best” price.
 - Action: Be responsive. Understand the sense of urgency.
 - Action: If at all possible, rotate actuarial pricing staff through U/W **as an underwriter** to allow actuarial staff to understand the dynamics of the underwriting job. At the least, have actuary staff attend U/W training sessions.
 - Action: If at all possible, support the use of underwriting staff in a short term rotation with the actuarial pricing staff to allow U/W staff to understand the dynamics of the actuarial job.
 - Remember: Sales is U/W's customer. U/W is Actuarial's customer.

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Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Recognize the fact statements like “the rates won't be ready until next month” or the “factors need another review” are not acceptable to an U/W department that needs to respond “now” or lose face.. or the case.
 - Action: Share clearly defined rate development timelines that reflect the reality of the marketplace needs...and meet them. Work backwards from the U/W market lead time needs as much possible when setting actuarial deliverables.
 - Action: Consider split of rating staff into long term and short term (development versus U/W support) if actuarial staff size and skill sets permit.

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Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Make sure that results shared with U/W during rate and factor development actually are generated when put into the rating system.
 - Action: Ideally, model the results of rate actions within the same rating engine used by U/W so that all interactions are played out exactly as would occur during rating. Remember that a small "average" impact may mask an actual spread of unacceptably high rates or undesirably low rates. Communicate a clear impact analysis of change prior to implementation.
 - Action: Develop a transition plan for pricing changes.

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Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Make sure that results shared with U/W during rate and factor development actually are generated when put into the rating system (continued).
 - Action: Where possible, limit extreme fluctuations when setting variables (trend, manuals, retentions).
 - Action: Understand impact of key or top groups on a segments pricing formula. Assuming an average action can be applied to all groups is not likely with very large or politically sensitive groups.

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Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Communicate conservatism, at least to senior U/W leadership.
 - Action: Set clear, traceable parameters and reporting for use of all or some of that conservatism. Without an understanding of actuarial goals, inadvertent results will occur. A lack of shared understanding of margins can have staff's working in opposite directions.

Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Monitor results
 - Action: Monitor results timely. Once a year at review time is not adequate. Ideally, the rating system will support such monitoring activities.
 - Action: Monitor results consistently. Make sure common understanding of monitoring approach, i.e., if MLR used, then common formula OR routinely reconcilable differences (i.e. actual MLR versus rating MLR). Understand differences in tracking to manuals (actuarial) versus budgets (U/W)

Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Communicate emergent impacts to senior U/W leadership.
 - Action: Develop a routine process for communicating emergent trends and potential changes in pricing strategy or formulas that might be in the pipeline.

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Actuaries and Underwriters: Successful Partnership

Let's get specific:

- Continually review process handoffs. Make sure that fixes or tweaks in the formula or factors do not result in double impact, if U/W has already instituted a “workaround” for the problem.
 - Action: Have regular meetings (biweekly is reasonable) of pricing actuarial staff and underwriting/underwriting system support staff to review process handoffs, timelines, deliverables, challenges. This is **not** a case review meeting but a focused communication meeting.
 - Action: Develop a formal process to understand gaps in rating formula, approaches, etc that require U/W workarounds and set rational timeframes to correct and meet those timeframes.

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Actuaries and Underwriters: Successful Partnership

- **Summary:**
 - Appreciate that Actuarial Science and the Art of Underwriting are mutually supportive, not exclusive.
 - Acknowledge that each has a role in making the company financially sound and grow successfully.
 - Recognize that partnership and peer thinking and related actions do not undermine Actuarial.

Deloitte.

The New Underwriting – And the Actuarial Role in This Process

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June 13, 2007
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Audit • Tax • Consulting • Financial Advisory.

Overview

- P&C Underwriting Today
- The P&C Actuary Today
- The New Healthcare Underwriting
- The Actuarial Role in the New Health Underwriting

P&C Underwriting Today

The History of P&C Underwriting

Progressive Insurance

- 1980's – Progressive began experimenting with alternative underwriting variables
- 1991 – Progressive became the first company to use credit scores
- 1996 – Credit scores implemented in all states
- 2002 – Progressive uses over 200 data elements in its scoring process
- 2004 – Progressive pilots a GPS car based system to record driving data points
- Today – Progressive now uses thousands of data elements in its scoring process

P&C Underwriting Today

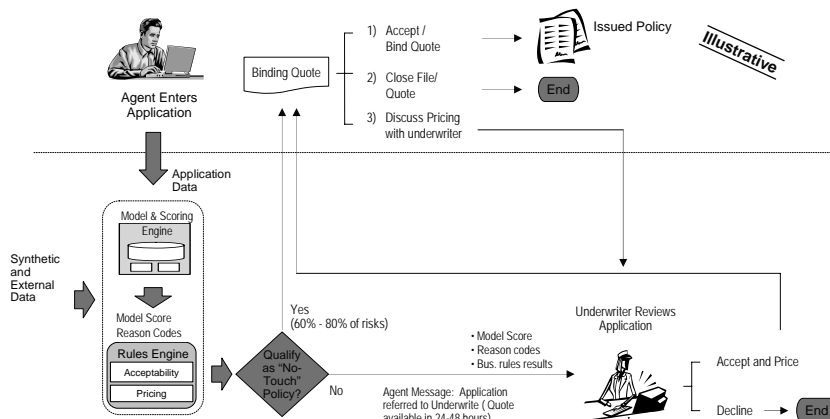
- Predictive Modeling is Table Stakes
- Used in:
 - New business
 - Renewals
 - Marketing and sales
 - Underwriting, pricing, reserving, managing and fraud
 - Commercial & personal
 - Biz liabilities, E&O, D&O, auto, home, workers comp, med malpractice, etc.
- Data Variables
 - Moved from solely credit score to 1,000s of variables
 - Looking at the present, the historical, and the changes over time
 - Internal elements
 - External elements
 - D&B, credit reporters, marketing datasets, government filings, legal proceedings, geo-coding, synthetic variable development, etc.
 - **Majority of current models' predictive value is coming from external data elements**

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5

Illustrative New Business Process

Predictive Modeling will help transform underwriting capabilities, enabling sustained profitable growth, increased ease of doing business for agents, and process efficiencies.



Improvements Over Current State:

- Streamlined data requirements
- Score calculated and quote returned to agent within minutes of app. entry
- Broader range of risks quoted

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- 60-80% of risk are not touched by UW; underwriter workload reduced
- Agent receives bindable quote for a majority of issues (price will not change at policy issuance)
- Agent can bind quote and send policy to issue in minutes

- Due to reduced UW referral volume, UW's provide faster turnaround time for referred files
- Score and rule reason codes guide underwriter risk and pricing decisions consistently across organization

6

The P&C Actuary Today

Expanded P&C Actuarial Roles

- Enhanced Pricing Responsibilities
 - Expanded Categories of Service
 - Preferred, Preferred Plus, etc.
 - Unique Channel/Distribution Challenges
 - Internet
 - Direct to Consumer
 - Bank
 - Etc.
 - Transparency
 - Internet
 - Price Elasticity
- Predictive Modeling Translation
 - Business Translation of Predictive Model Results
 - Underwriting Translation of Predictive Model Results
 - Automation

The New Healthcare Underwriting

Predictive Modeling - A Move Towards Healthcare

- Workers Compensation
 - Medical component is now >50% of costs
 - Non-medical elements >50% of predictive power
 - Boss's rating greater predictor than diagnosis (medical grouper)
 - D&B information
 - Individual lifestyle, financial, and household data
- Disability
- Life (mortality)
- Medical

Predictive Modeling

Predictive Modeling applies mathematical and statistical techniques to predict the future profitability of a book of business at a policy level basis.

Predictive Modeling

An Objective Approach to Analyze Risk

- Limits subjective reasoning from the underwriting process
- Leverages internal and external data to predict individual risk profitability at the policy level
- Utilizes historical data to develop the model and enhance predictive power

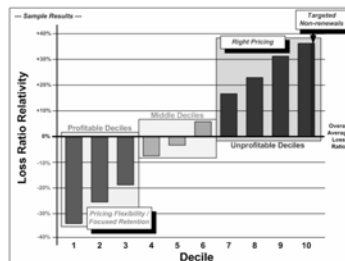
A Tool to Allow Increased Efficiency

- Can allow for increased amount of "low touch" policies/claims
- Provides objective guidance for more efficient and consistent pricing
- Improves underwriting workflow allocation efficiency for appropriate assignment of resources

A Means to an End

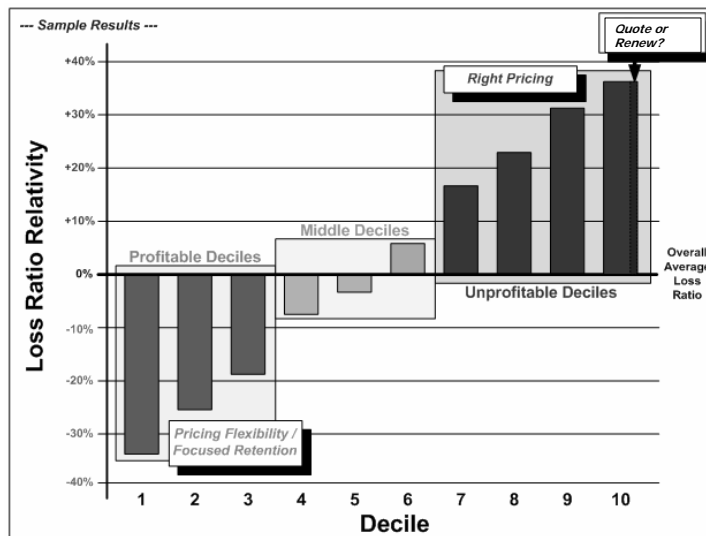
- The predictive model itself delivers the relative profitability indication for each policy
- The business value to be obtained from the predictive model comes from careful implementation of model results into underwriting process, pricing, and systems

Sample Lift Curve



The model supports key business decisions and yields increased profitability and growth.

Predictive Modeling Overview – What can You Do with the Models?



Current Predictive Modeling in Healthcare

- Internal Data – Medically-Based
 - Traditional claims data
 - ICD-9
 - CPT4
 - Episode groupers, etc.
 - Newer claims categories
 - Pharmacy data
 - MIB
 - Lab data
 - Only about 25% of the population has enough medical data to make a significant impact on a predictive model
 - ***Considering retention issues, lack of historical data, and poor data matching techniques, the average health plan has significant predictive medical data on only about 12% to 15% of its population***
- Other Internal Data
 - Application data
 - HRAs

Lifestyle-Based Analytics (LBA) – The Future

- Roots are in predictive modeling
- Maps lifestyle behaviors to health risks
- Focuses on strong correlations that exist between lifestyles and many disease states
 - Diabetes
 - Hypertension
 - Cardiovascular
 - Stroke
 - COPD/Respiratory
 - Back Pain
 - Maternity
 - Most cancers
 - Some mental health: Depression, Alzheimer's, etc.
 - Others: Osteoporosis, Arthritis, etc.

LBA Example

Diabetes Profiling Example			
Data Element	Employee A	Employee B	Diabetes Ratio A to B
Age	40	40	1 to 1
Vehicle Type	MiniVan	MiniVan	1 to 1
# of Children	3	0	1 to 10
Outdoor Rec	4 plus	No	1 to 25
Fast Food	Rarely	Frequent	1 to 40
Lifestyle Ind	M7	RE3	1 to 60
Hobbies	Active Outdoor	Reading	1 to 80
....
....
Online Purchasing	Sporting Goods	Clothes	1 to 110

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15

Maternity Example

Traditional maternity factors are based on age/sex/geographic/family enrollment

- A simple Empirical model using number and ages of children can increase accuracy by over two-fold
- Additional lifestyle elements can dramatically improve accuracy by including financial indicators, household living parameters, square footage of house, number of bedrooms, type and size of vehicle, etc.

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16

Maternity Model

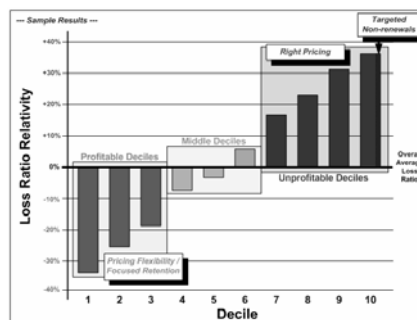
Sample Birth Rates

35 yr female – 6.9%

- With 0 Children – 6.0%
- With 1 Child – 9.1%
 - With a newborn – 4.3%
 - With a 2 yr old – 15.4%
- With 2 Children – 6.5%
 - Ages 10 & 8 – 2.8%
 - Ages 4 & 2 – 9.1%
 - Boy & girl – 5.8%
 - Two girls – 12.5%
- Range considering age & sex of children and spouse is from 1% to 29%

Underwriting Applications

- Individual & Small Group Health Underwriting
 - Augment current techniques
- Medium Group Health Underwriting
 - Absence of medical data
- Preferred Underwriting
 - Predictor of the healthy (preferred)
- Tele-Underwriting
 - Criteria for identification
- Fraud Detection



The Actuarial Role in the New Health Underwriting

New Risk Classifications

- Historically, Health Underwriting Focused Only on the Sick
 - For the first time ever, we are able to determine the health of the healthy
- Next at Risk Categories
 - Those who have not yet had a medical event but have a lifestyle indicating they are highly at risk
 - Over 60% of next years high cost claimants will come from this pool
- Preferred Categorizations
 - How healthy is an individual with no historical claims history
 - Rank ordering of the claimless “healthy” individuals from the tri-athlete to the couch potato

Population Underwriting/Pricing

- New Business has Always Presented Many Challenges
 - Conservative pricing and underwriting has been rule of thumb
- New Business Predictive Models
 - Using commercial data sources about the individuals and/or the company we now know considerably more about the expected morbidity
 - What will the resulting additional information do to the underwriter, the underwriting decision and the resulting morbidity experience?
- Population Trends and Management
 - Historical population management has been tied to SIC or geography
 - Our new understanding of the population allows for more accurate predictions about the future trends of the enrolled and applying populations in aggregate

Transparency

- Product and Pricing Transparency
 - Automation will bring about pricing transparency
 - Transparency and competition will demand the need for the development of accurate price elasticity models and price demand curves
- Underwriting Decisions No Longer Simple Discounts
 - Currently, the move off of a standard underwriting rate is a decision made between the underwriter and the sales/marketing force
 - In the future, the implication of this move will be felt by the entire organization

Predictive Modeling Translation

- Actuaries Will Need to Lead the Predictive Modeling Translations
 - Business Translation of Predictive Model Results
 - The enhanced knowledge of morbidity will need to be translated into actionable pricing results
 - Underwriting Translation of Predictive Model Results
 - Predictive models are another tool in an underwriters toolbox, not the ultimate solution
 - Actuaries will need to translate the predictive results into the ultimate underwriting strategies
 - Automation
 - Automation = Standardization
 - Actuaries will need to evaluate the good and bad that comes along with automation

What is the Future?

- Watch as earlier adopters in the world of underwriting automation gain significant competitive advantages by picking off the best risks, eliminating the worst risks, or even both
- To date, successful early adopters have had strong entrepreneurial actuarial departments leading or helping to lead this next generation of underwriting
- As managed care continues to move towards managed health, the importance of predictive models will increase and thus the role of the actuary will expand
 - In disease management the need to assess those who are next at risk, not just those who are currently diagnosed
 - In marketing and sales, the paradigm is shifting to marketing to the healthiest populations or the most profitable populations