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S03 Session 3: Applying Predictive Analytics in Underwriting Requirement Determinations

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Active participation in the Society of Actuaries is an important aspect of membership. While the positive contributions of professional societies and associations are well-recognized and encouraged, association activities are vulnerable to close antitrust scrutiny. By their very nature, associations bring together industry competitors and other market participants.

The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

There is no safe harbor under the antitrust law for professional association activities. Therefore, association meeting participants should refrain from discussing any activity that could potentially be construed as having an anti-competitive effect. Discussions relating to product or service pricing, market allocations, membership restrictions, product standardization or other conditions on trade could arguably be perceived as a restraint on trade and may expose the SOA and its members to antitrust enforcement procedures.

While participating in all SOA in person meetings, webinars, teleconferences or side discussions, you should avoid discussing competitively sensitive information with competitors and follow these guidelines:

- Do not discuss prices for services or products or anything else that might affect prices
- Do not discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- Do not speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- Do leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- Do alert SOA staff and/or legal counsel to any concerning discussions
- Do consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

Adherence to these guidelines involves not only avoidance of antitrust violations, but avoidance of behavior which might be so construed. These guidelines only provide an overview of prohibited activities. SOA legal counsel reviews meeting agenda and materials as deemed appropriate and any discussion that departs from the formal agenda should be scrutinized carefully. Antitrust compliance is everyone’s responsibility; however, please seek legal counsel if you have any questions or concerns.
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Dynamically performs cost-benefit analysis to optimize requirement ordering decision.
Requirements Determination
Is a Cost Benefit Analysis
Drivers of Protective Value for a Given Requirement

Cost of Requirement

Age
Amount
Risk
Define the Risk
Risk of the Impairment that the Requirement is Able to Detect

• The risk is specific to the requirement

• The higher the risk, the higher the protective value the requirement has

• For example, the higher risk of diabetes, the higher protective value an A1C test would have
Conventional Requirement Determination: AA Table/Grid

The risk (defined previously) is not considered, as it is assumed to be average.
DRA Includes Risk Assessment as Part of Protective Value Evaluation

Individual Age & Amount Risk

Risk

Review results of available evidence

Enough Protective Value

Waive Requirement

Order Requirement
DRA is a Dynamic Process

Risk Assessment → Protective Value Evaluation → Requirement Determination

1. Individual Age & Amount Risk
2. Review Results of Available Evidence
3. Enough Protective Value for Next Requirement
4. Order Next Requirement
5. Waive Next Requirement
Less precise determination (Conventional)

More precise determination (DRA)

Requirement not needed

Requirement needed

Waste

Waive requirement

Order requirement

Mortality slippage
The DRA Concept is Not Totally New

Some examples of how we include risk assessments in requirement determination

• “Reflex Testing”
  • Require HbA1c testing if glucose or fructosamine results are high
  • Require hepatitis testing if LFT is elevated

• “APS for cause”
  • Require an APS upon finding or suspicion of a certain impairment
DRA Use Case: Accelerated Underwriting

Fluid Requirement Determination
Conventional Accelerated Underwriting

- **App questions**: MIB, MVR, Rx, Credit
- **Age/face amount eligible**: Below Risk Threshold
- **Below Risk Threshold**: Accelerated Underwriting without fluids / paramed
- **Full Underwriting**: with fluids / paramed
DRA for Accelerated Underwriting

Risk Assessment

- Age/Sex
- Face Amount
- AU Cost Effectiveness

Risk: Likelihood of FUW resulting in worse class than AU

Full Underwriting with fluids / paramed

Accelerated Underwriting without fluids / paramed
How to Perform the Risk Assessment

Risk is defined as the likelihood of FUW resulting in a worse class than AU

A
- Build training data: retrospective study
- Have both FUW and AU results available

B
- Develop a prediction model
- Predict probabilities of FUW resulting in a worse class than AU

C
- Apply the model to future AU data
- It becomes the result of risk assessment

A smoking-propensity model that predicts the likelihood of an applicant being urine-cotinine positive is an example of such risk assessment.
Case Study

Retrospective study from a carrier with full underwing (FUW) results

Underwriters performed risk assessment using Disclosure, MIB, MVR, and Rx

Predicting the risk of having worse class from FUW than AU

Protective value of FUW vs. Cost of FUW

Conventional AU

AU by DRA

AU Rules

DRA
Case Study:
Conventional vs. DRA (Same Acceleration Rate)

N=930, average age=44 (25-60), 61% male, average face amount 347K (100K-1M)

FUW N=425
AU N=505

Conventional (Rules)

DRA (Matching Conventional)

372, 90, 43
Top 3 Class Distribution (SP, P, STD) 372, 90, 43

$428
Mortality Slippage Cost
(PV over 15 years, per case)

$95
Other DRA Example

- Age/Sex
- App questions
- MIB
- MVR
- Rx
- Credit

Risk Assessment → APS Cost Effectiveness

EHR data

APS Waive

APS Request
DRA Perspective on Smoking Propensity Model
Compared with Risk Classification Perspective

**DRA Perspective**

- Probability of Smoking
  - AU Cost Effectiveness
    - Accelerated Underwriting
    - Full Underwriting

**Classification Perspective**

- Probability of Smoking
  - Is It Low Enough
    - Smoker
    - Non Smoker