

Use of Predictive Modeling in Claims Management

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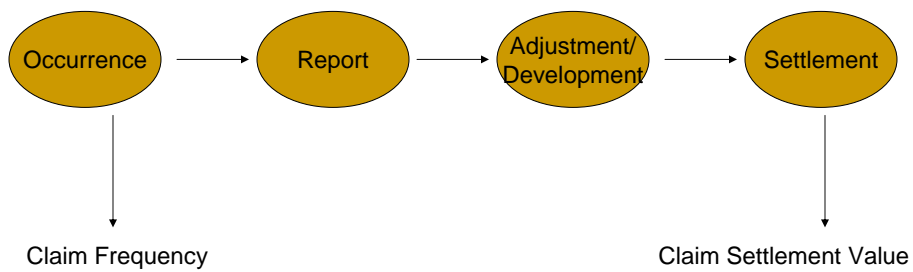
- Background
- Applications
 - Claim Settlement Values
 - Large Loss Modeling
 - Claims Management
 - Legislative Costing



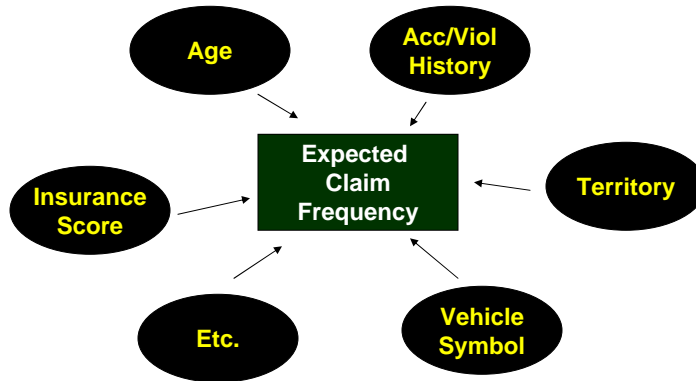
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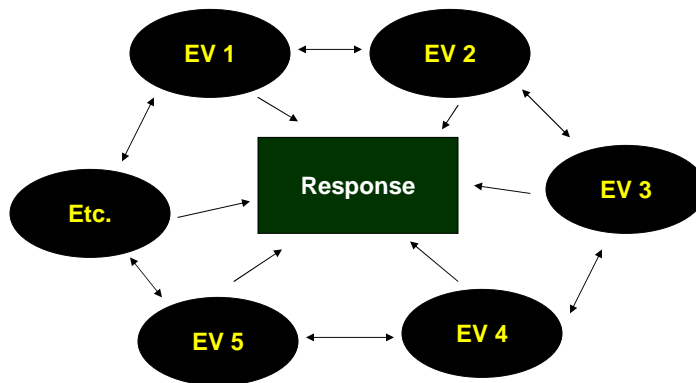
Claims Process



Claim Frequency Modeling



Why Stop There?



Applications

Applications

- Claims Settlement Value Estimation
- Monitoring Higher Severity Claims
- Claim Service Provider Evaluation
- Legislative Costing
- Severity Trends
- Fraud Detection
- Etc.

Claim Settlement Value Modeling

- Begin with closed claim history
- Include ultimate settlement amount and characteristics of claim
- Develop model to determine impact of claim characteristics on ultimate settlement value
- Split model development between limited and excess amounts

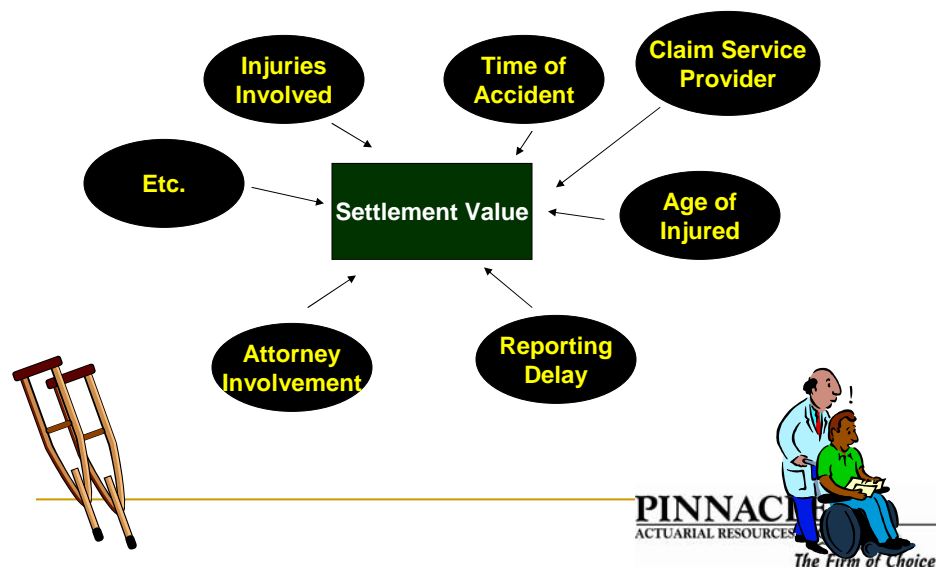
Factors that Impact Severities

- Geography (State or Regional Courts)
- Time (Inflation, Settlement Lags)
- Claimant Characteristics (Age, Class)
- Insured Characteristics (Vehicle Weight)
- Attorney Involvement
- Preferred Claim Network (Medical, Glass, Auto Repair, Attorney)
- Other Claims Features (Arbitration/ADR, Settlement Lag)

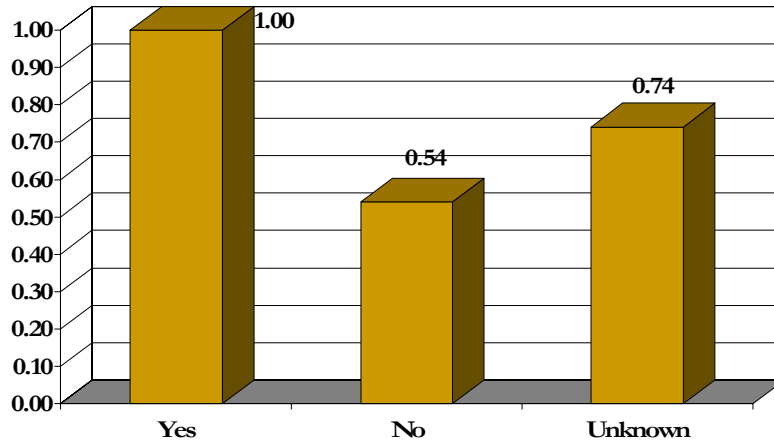
Example – IRC Data

- 1994 Insurance Research Council (IRC) Closed Claim Study
- Bodily injury liability
- Variables included
 - Injury specifications
 - Injured characteristics
 - Treatment descriptions
- Model developed to estimate claim amount

Claim Settlement Value Modeling

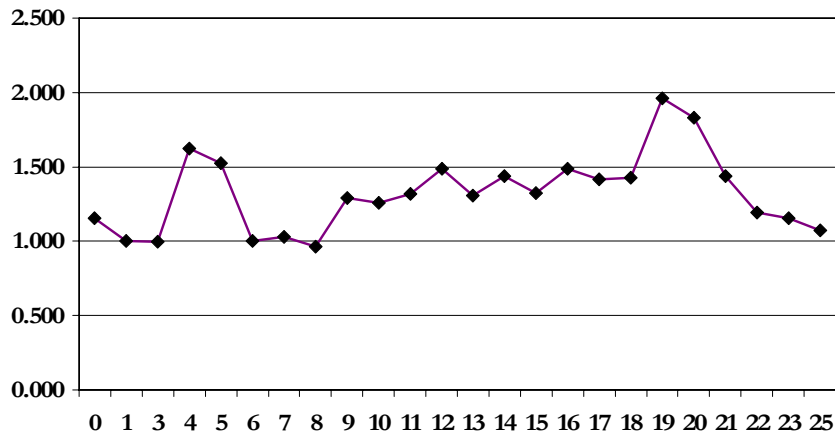


Limited Claim Settlement Value Modeling – Attorney Involvement



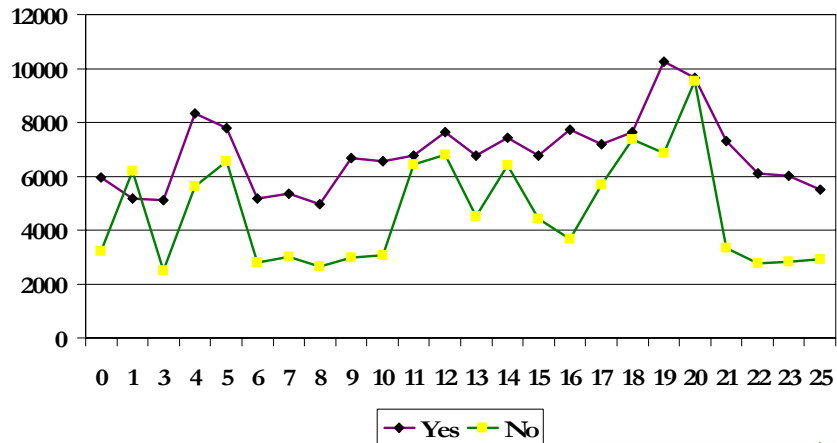
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Limited Claim Settlement Value Modeling – Type of Injury



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Limited Claim Settlement Value Modeling – Type of Injury by Attorney Involvement



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Excess Loss Analysis

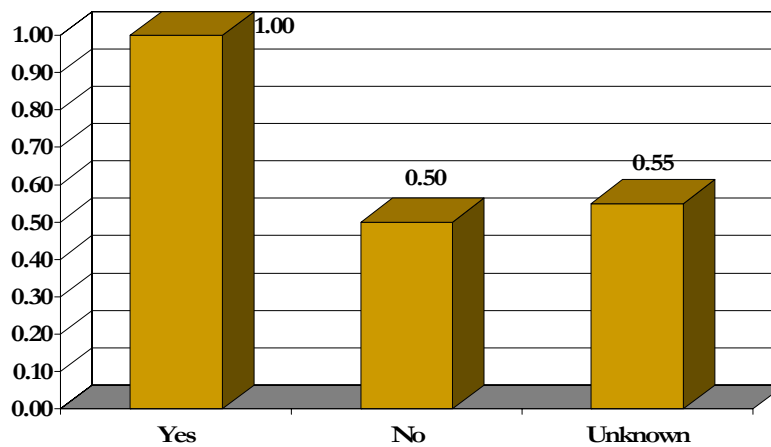
- Need to reflect claim settlement amounts greater than cap
- Traditionally, load back equal proportion to all claims
- Does not reflect reality that different claims have different likelihood of reaching excess

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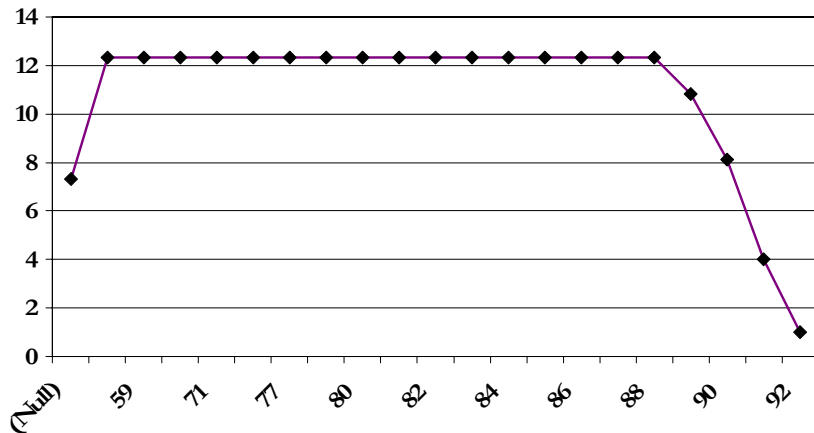
Excess Loss Analysis

- Could analyze excess loss frequency and excess loss amount
- Severity portion volatile
- One approach
 - Binomial analysis – likelihood of claim piercing the excess threshold
 - Multiply by average excess severity to get expected excess amount

Likelihood of Large Claim – Attorney Involvement



Likelihood of Large Claim – Accident Year



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Claim Service Provider Evaluation

- Currently, many evaluations of performance are based on “one-way” analyses
 - Claim service providers – average severities
 - Agencies – loss ratio, frequency, severity
- Predictive Modeling Approach: Using predictive modeling, determine value added or detracted by service provider
 - Treat service provider as another explanatory variable
 - Result of analysis is value added or detracted by provider

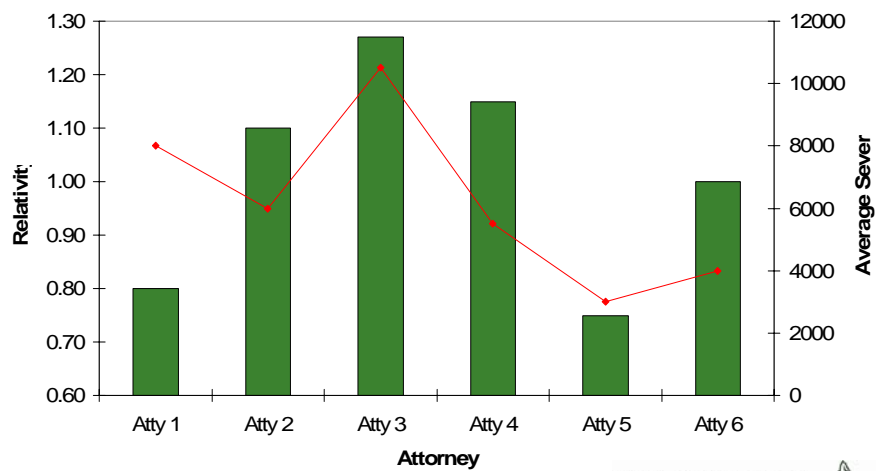
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Claim Service Providers

- Claim representatives
- Doctors & Hospitals
- Vocational Rehabilitation Centers
- Auto Repair Shop
- Auto Glass Companies
- Special Investigation Units
- Lawyers
- Etc.



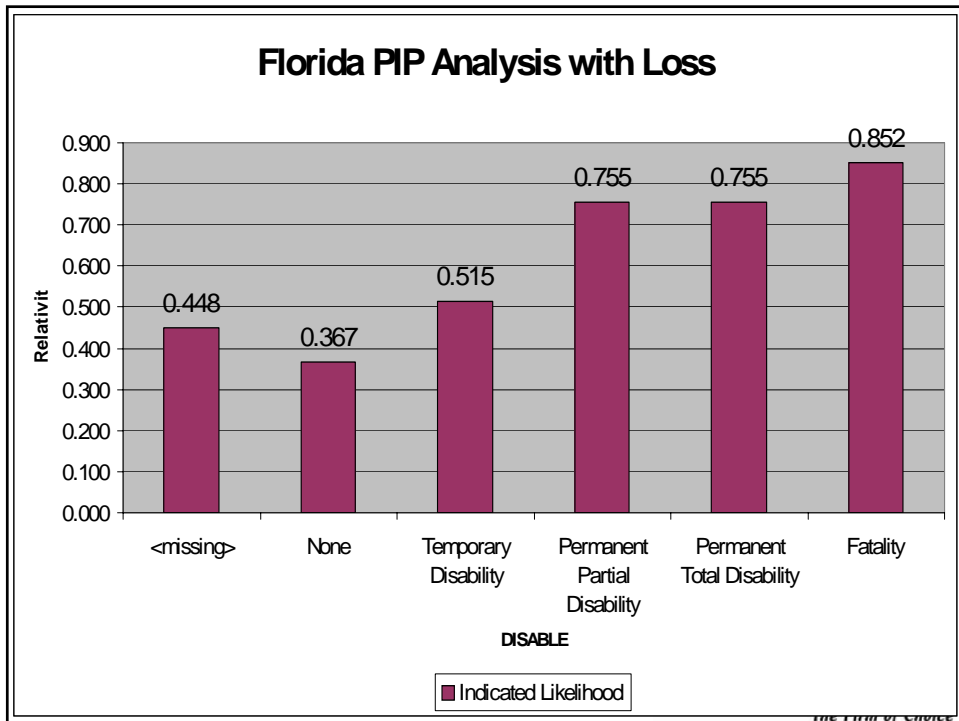
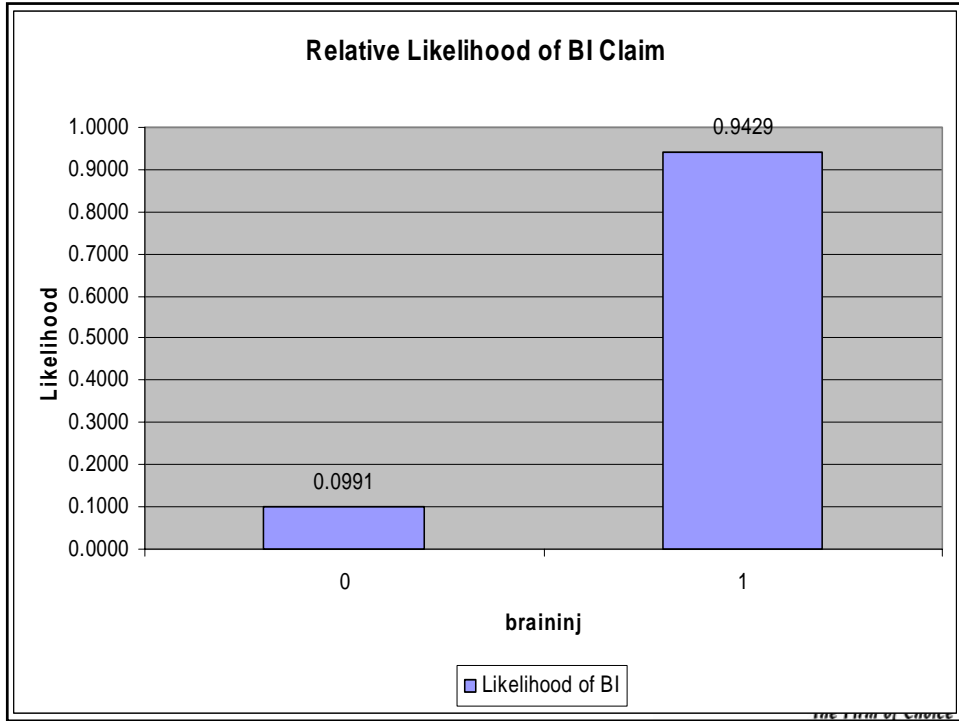
Attorney Relativities



Legislative Costing Example - Likelihood of Bodily Injury Claim

Likelihood of BI claim

- The problem...
 - Based on the characteristics of a given a PIP claim,
 - What is the likelihood of a BI claim developing?
- Analysis: logistic regression model
- Data
 - 1994 Insurance Research Council Claim Study
 - Personal Injury Protection Data for FL
 - Response: Claim piercing the PIP threshold



Significant Opportunities

- Enhanced estimate of needed case reserves
- Improved assignment of claim to claim handlers
- Better assignment of claims to service providers
- Large claim early warning system
- Early warning of significant claim “development”
- Real dollar savings
- Better fraud detection



Challenges

- Data
- Expertise – partnering vs. taking over
- Existing products

