



Applying GLM Techniques in Non-Traditional Areas

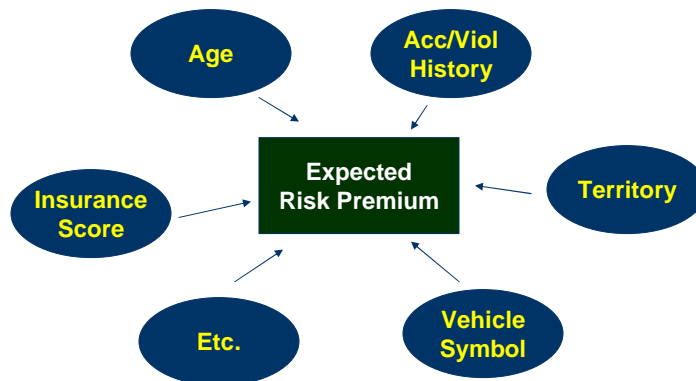
Roosevelt Mosley, FCAS,
MAAA

CAS 2003 Ratemaking
Seminar

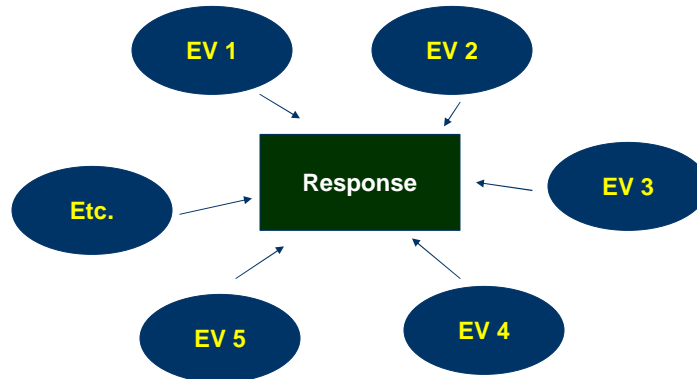
San Antonio, TX

March 27-28, 2003

General Application of GLM to Insurance



Why Stop There?



Why Stop There?

- GLM is a general statistical process
- The most immediate application has been ratemaking
- Can be expanded to other areas

Applications

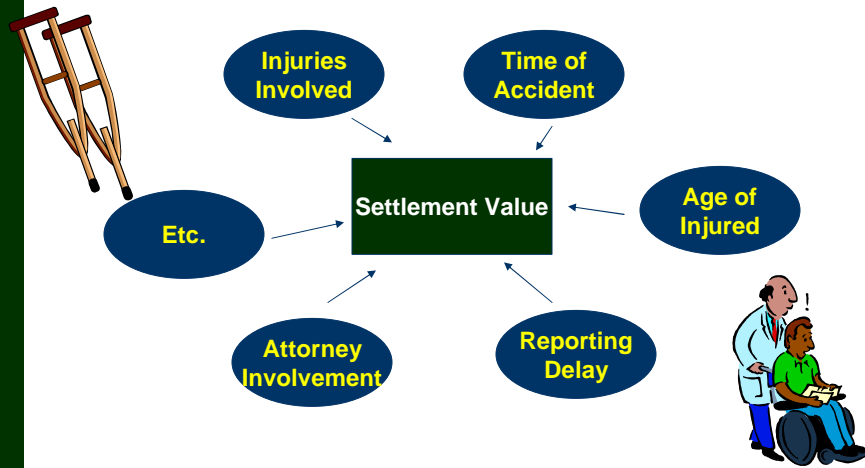
- Claims Settlement Value Estimates
- Vehicle Classification
- Service Provider Evaluation
- Marketing Effectiveness



Claim Settlement Value Modeling



Claim Settlement Value Modeling

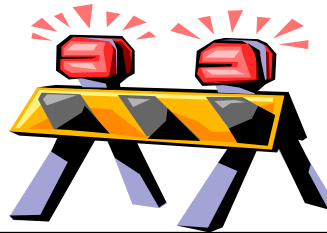


Claim Settlement Value Modeling

- Begin with closed claim history
- Include ultimate settlement amount and characteristics of claim
- Develop GLM model to determine impact of claim characteristics on ultimate settlement value

Claim Settlement Value Modeling - Cautions

- Does not replace the claim adjuster!
- Does not make the actuary a claims expert!
- Trending
- “Frequency” component - closed without payment



Case Study

- Insurance Research Council 1992 Closed Claim Study
- Used 200+ description variables to determine impact on closed claim amount
- BI, PIP, MP, and UM coverages



Vehicle Classification



Vehicle Classification – Traditional Approach

- Look at experience of vehicle types
- Group vehicles into cost levels based on repair costs



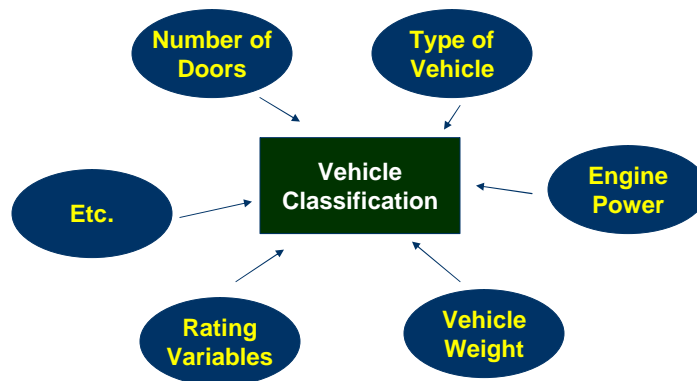
Difficulties Applying Traditional Approach

- Sparse data
- Expensive
- Does not account for interaction with other characteristics

Alternative Approach: Instead of grouping vehicles by make and model, group them by vehicle characteristics.



Vehicle Classification Modeling

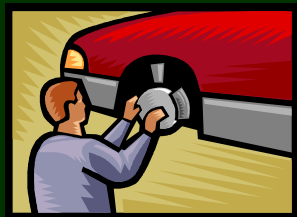


Vehicle Classification Modeling - Applications

- Enhancement to current symbols
- Independent symbols
- Liability symbols
- Removal of distributional biases



Service Provider Evaluation



Service Providers

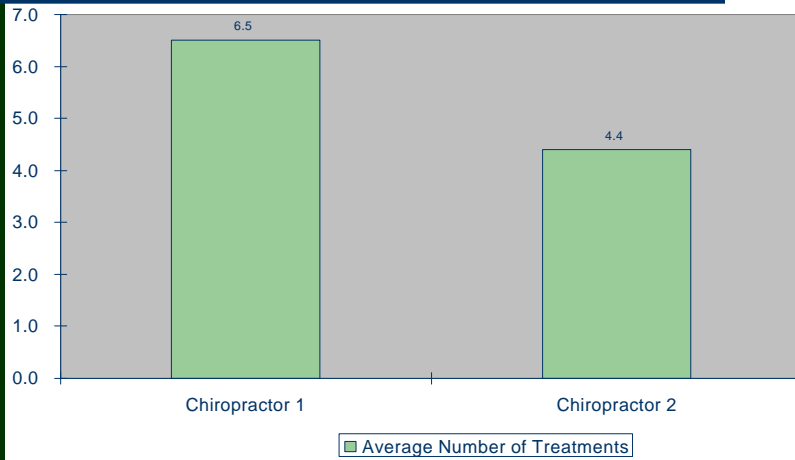
- Third party claim administrators
- Worker's compensation managed care networks
- Preferred providers
- Preferred auto body shops

The goal is to evaluate the effectiveness of different service providers

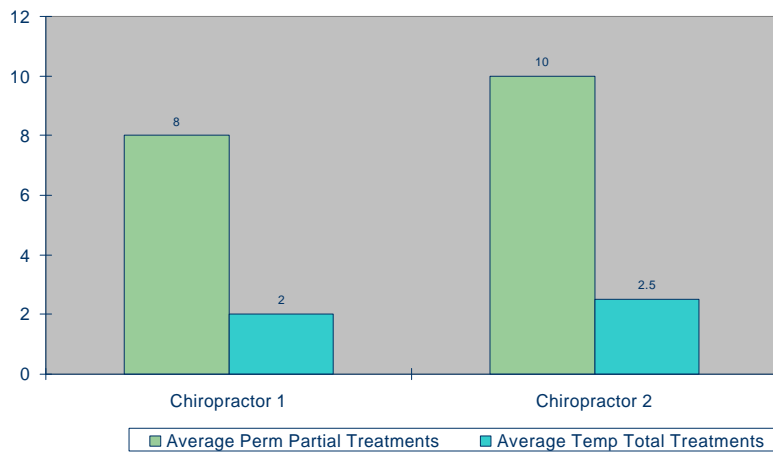
Service Provider Modeling



Utilization Review – Average Number of Treatments

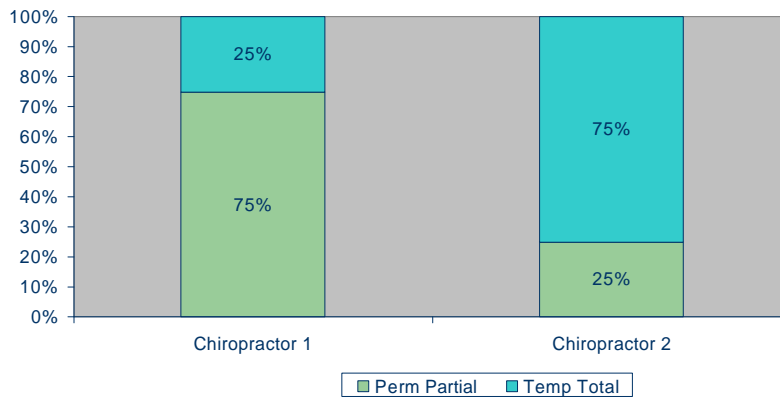


Average Number of Treatments

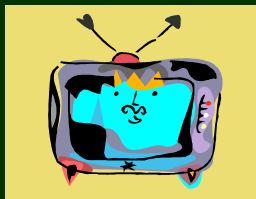


Treatment Mix by Provider

Claims Mix by Adjuster



Marketing Effectiveness



Marketing Effectiveness



Examples of Modeling Marketing Effectiveness

- Understand how effective different mediums are (TV, internet, radio, etc.)
- Are the responders the types of risks you are aiming for?
- How likely are we convert the risks who respond?

Overall Considerations

- Expertise
- Data
- Creativity