PREUSSER RESEARCH GROUP, INC.

Induced Exposure

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General Exposure Estimates

- Population/VMT/Licensed Drivers
  - Good for some things
  - Cannot be effectively disaggregated for teen drivers, and not at all for teens with passengers
  - Also, VMT confounds type of driving with who is doing the driving
    - e.g. Teens and elderly have highest per VMT crashes but drive fewer miles on the safer Interstates than other drivers.

Self-Report Exposure

- Trip Logs May Not Be Very Accurate
  - Leaf et al. (2008)-recall of mileage for driving done the previous week did not match odometer readings well
  - Summing miles from individual trips is better
- The National Household Travel Survey
  - Small teen sample size
  - No info about riding with passengers (outside of household)

Induced Exposure (IE)

- Not at Fault Crashes are Random Events
  - ∴ The not responsible drivers are representative of the population in question
  - But, more specifically, representative of the risk of crashing for a specific group (e.g. teen drivers with passengers) without the influence of the specific risk factor
    - Not at fault crashes represent the baseline risk of teens with passengers crashing without the influence of the passenger (even if they are present)

Induced Exposure

- Not at fault drivers are used as the denominator in a risk per exposure rate calculation
- At fault are the numerator
- Can then be used to calculate Odds Ratios (Regression Analyses), Relative Risk, etc.

Induced Exposure

- The Relative Risk calculated by IE is the added risk of the factor (e.g. passengers) applied to the specific group (e.g. teens)
  - That is, the increased risk for teen drivers passengers relative to some reference group (older, teens w/o passengers), is the risk associated specifically with the presence of passengers (or being a teen w/passenger) and NOT a function of the exposure to other risk factors (e.g. more miles on local versus Interstate roads)

IE Considerations

- Determining “responsibility”
  - Some crash data include police assigned “fault”
  - Otherwise, determining fault requires more care
  - FARS: Driver Level Factors to assign “Fault”

IE Considerations

- Limit to 2 vehicle crashes?
- Single Vehicle Crashes?
  - Some studies consider them “at fault”
  - Other studies leave them out

Conclusion

- Induced exposure is effective at estimating risk when actual exposure data are not available or cannot be appropriately disaggregated.
- Allows analyses with large data sets (FARS, State Crash Data) with minimal data collection
- Care is needed in choosing data