Predicting Driver Crash Involvement

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Background

- Research indicates *driver-related* factors as leading cause of most commercial vehicle-related crashes

- UGPTI Carrier-Driver-Conviction study (2001)

  - Companies that hire drivers with more convictions have higher crash rates

First Crash Predictor Study - 2005

- Partnership with ATRI and CVSA
- Focus on driver behaviors and relationship to future crash involvement
  - Used violation and crash data from MCMIS and conviction data from CDLIS
- Worked with law enforcement to identify effective countermeasures

Methodology

- Identified about 540,000 U.S. drivers from three (3) months of inspections

- Combined two (2) years of inspection violations, driving convictions, and crash data from the drivers

- Examined behaviors in one year and likelihood of crash in the next year

Question

- If a driver had a Reckless Driving violation in one year, how much does this increase the likelihood that they will have a crash in the next year?
  - A) 25%
  - B) 50%
  - C) 75%
  - D) 100%+

Answer

- If a driver had a Reckless Driving violation in one year, how much does this increase the likelihood that they will have a crash in the next year?
  - A) 25%
  - B) 50%
  - C) 75%
  - D) 100%+

Results from 2005 Study

- Violations that increased crash likelihood over 100%
  - Reckless driving and improper turn
- Convictions that increased crash likelihood between 91% and 100%
  - Improper lane change, failure to yield, improper turn, and failure to keep in lane

Results from 2005 Study

- A past crash increased the likelihood of a future crash by 87%
- Survey of enforcement strategies
  - Specifically target aggressive driving, both for CMV and non-CMV drivers
  - Use both visible and covert activities
  - Conduct analysis to identify problem areas

Results from 2005 Study

- Survey of industry strategies
  - Actively involved in safety councils
  - Test/use new safety systems
  - Award winning safety programs
  - Clear, documented policies
  - Accessible, engaged safety directors
  - Holistic view of safety

Industry strategies (continued)

- New driver orientation / training and sustainment training

- Safety awareness and incentive programs

- Driver reviews and targeted training

2011 Update

- Same methodology – about 587,000 U.S. drivers with two (2) years of data

- Many similar results / a few differences
  - The 2005 study had violations as five (5) of top 10 predictive behaviors, whereas there was only one (1) in the 2011 study
  - Possible impact of law prohibiting masking

2018 Update

- Same methodology – about 439,000 U.S. drivers with two (2) years of data

- Additional age and gender analysis
  - Normal distribution of age, with mean = 46
  - About 97.5% men, 2.5% women

- Drivers younger than 35 or older than 80 at elevated risk

Negligent Driving Convictions by Age
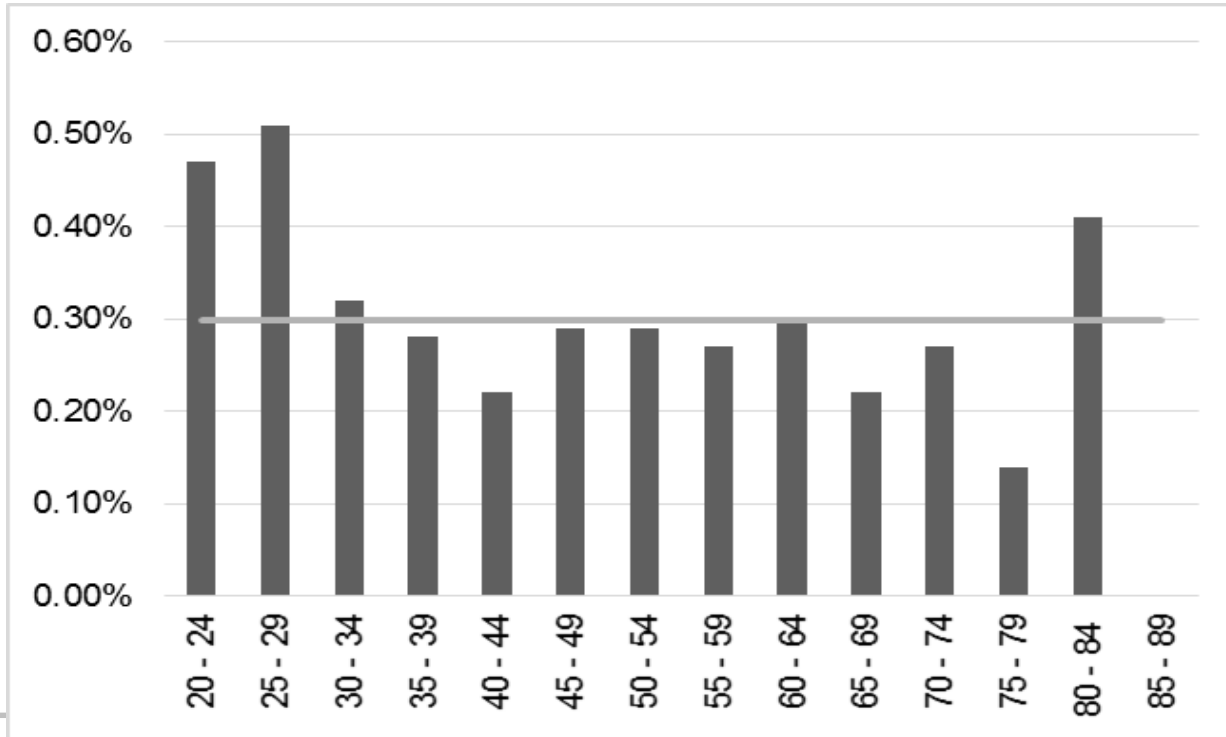
Impact of Gender

- Female drivers safer than males in every statistically significant behavior
- Men involved in 20% more crashes than women

Event	Relative to Females, Likelihood for Males Increased By:
Reckless / Careless / Inattentive / Negligent Driving conviction	88%
Seat Belt violation	78%
Failure to Obey Traffic Signal / Light conviction	73%
Speeding 1-15 Miles Over Speed Limit conviction	70%

2018 Update

- Across all three studies, the top five stable predictors of crash risk
  - A Past Crash
  - An Improper Lane / Location conviction
  - A Reckless / Careless / Inattentive / Negligent Driving conviction
  - An Improper / Erratic Lane Changes conviction
  - An Improper Lane Change violation

Commercial Vehicle Safety Center

- Serves as a contact for universities, law enforcement, and driver licensing agencies to establish partnerships
  - www.ugpti.org/outreach/cvsc/
- Hosted Safety Summit in 2018 and will be hosting another one in 2020
- Ongoing webinars

CVSC Resources

- Commercial Driver Licensing
- Connected and Autonomous Vehicles
- Decriminalization of Marijuana
- FMCSA Rulemakings and Programs
- Best Practices
- Research and Partnerships

Questions? Comments?

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