Prevalence of Drowsy Driving On the Road and in Crashes

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Overview

Prevalence on the road

- Actually falling asleep
- Drowsy / fatigued

Prevalence in crashes

- Official statistics from NHTSA
- Special studies

Summary

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Prevalence on the Road – National Surveys

"Fallen asleep or nodded off" while driving

- Lifetime: 37[1] - 41%[2]
- Past year: 11%[1,2]
- Past Month: 4%[1,2,3]
- Likely under-reported

Driving when "so tired I had a hard time keeping my eyes open" [2]

- 27% at least once in past month
- 2% "fairly often or regularly"

Sources: 1. NHTSA, 2002; 2. AAA Foundation, 2010; 3. CDC, 2013

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Prevalence in Crashes: Official Statistics

In 2009

- 2.4% of fatal crashes
- 2.0% of injury crashes
- 1.3% of all crashes

  involved a drowsy driver

Source: NHTSA Traffic Safety Facts: Drowsy Driving. DOT HS 811449

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Problems with Official Statistics

Derived from police crash report forms

- Difficult to ascertain after the fact
  - Driver might not want to admit drowsiness to police
  - Driver might not realize/remember
  - Driver might be unconscious or deceased
- Many state crash report forms use checkboxes

  Critical distinction often lost:
  - Unchecked box = not drowsy?
  - Unchecked box = unknown?

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Special Studies

- 100-Car Naturalistic Driving Study (NHTSA, Virginia Tech)
- Stutts and colleagues (2006)
- National Motor Vehicle Crash Causation Survey (NHTSA)
- AAA Foundation for Traffic Safety (2012)

Prevalence in Crashes: 100 Car Study

- Sample of 109 vehicles in and around Northern Virginia observed continuously for 12-13 months with cameras, sensors, etc
- Drowsiness assessed from pre-crash video (Observer Rating of Drowsiness, PERCLOS)
- Estimated moderate-to-severe drowsiness contributed to 22-24% of crashes and near-crashes

Klauer et al. The Impact of Driver Inattention on Near-Crash/Crash Risk. NHTSA. DOT HS 810594

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Prevalence in Crashes: Stutts et al. (2006)

- Used data from drowsiness-related and non-drowsiness-related crashes in North Carolina
- Fit regression models to predict probability of drowsiness based on driver & crash characteristics included in police reports
- Applied model to national data on fatal crashes (years 2001-2003)
- Estimated 15% of drivers in fatal crashes were drowsy, authors called estimate “conservative”

Source:
Unpublished Manuscript, University of North Carolina Highway Safety Research Center

Prevalence in Crashes: National Motor Vehicle Crash Causation Survey

- In-depth multidisciplinary investigation of 5,470 crashes to which EMS was dispatched (2005-2007)
- Fatigue assessed via in-depth interviews regarding recent and long-term sleep, work, medications, etc.

***Only investigated crashes 6 AM – midnight;
no data on crashes midnight – 6 AM

National Motor Vehicle Crash Causation Survey, Report to Congress. 2008. NHTSA. DOT HS 811059

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Prevalence in Crashes: National Motor Vehicle Crash Causation Survey

Drivers

- 2% asleep
- 5% (additional) fatigued
- 29% unknown

Crashes

- 3% involved driver asleep
- 10% involved fatigued driver
- 40% involved at least one unknown if fatigued

NMVCCS data, downloaded from ftp://ftp.nhtsa.dot.gov/NASS/NMVCCS/.
Unpublished analysis by author.

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Prevalence in Crashes
AAA Foundation for Traffic Safety (Tefft, 2012)

- Sample of vehicles from 47,597 crashes in which at least one vehicle was towed from the scene, 1999-2008
- Data on drivers' attentiveness obtained from multiple sources including interviews by investigators (i.e., not just police report)
    - 2% of drivers coded as drowsy
    - 45% coded as Unknown
- Used multiple imputation to estimate proportion of "unknowns" that were likely drowsy

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Prevalence in Crashes – AAA Foundation

Overall

- 4% of drivers were drowsy
- 7% of crashes involved a drowsy driver

- Crashes with occupant hospitalized
  - 8% of drivers
  - 13% of crashes

- Fatal crashes
  - 12% of drivers
  - 17% of crashes

Tefft BC. (2012) Prevalence of motor vehicle crashes involving drowsy drivers, United States, 1999-2008. Accident Analysis & Prevention. 45(1): 180-186.

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Comment

- No single study is definitive
- Studies with best ascertainment of drowsiness have least representative samples and vice versa
- Probably unrealistic to expect solid ascertainment of drowsiness in data routinely collected by police…

…but still critical to be able to distinguish
"Not drowsy" vs. "Unknown if drowsy"

Summary

- ~40% of drivers have (knowingly) fallen asleep while driving
  - 11% in past year
  - 4% in past month
  - Consistent across multiple studies
  - Still likely under-reported

- Official statistics show 1-2% of crashes involve drowsy driving
  - Likely a substantial underestimate

- The best studies show much higher prevalence:
  - 7-24% of crashes involve drowsiness
  - Prevalence higher in more severe crashes

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