Pedestrian fatality risk

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Presented in Åbo, 13 May 2011
Publications

- **Pedestrian fatality risk as a function of car impact speed**
  - Rosén E, Sander U

- **Pedestrian injury mitigation by autonomous braking**

- **Literature review of pedestrian fatality risk as a function of car impact speed**
  - Rosén E, Stigson H, Sander U
"Government admits speeding fatality statistics were exaggerated"

"Government admits to exaggerating accident statistics"
Real-World Accident Data

- GIDAS 1999–2007
- 15+ years
- Hit by front of passenger car
- Not lying on the ground

- 490 cases
- 36 fatalities
- Weight factors derived from national statistics
Sampling bias – an example

- Sampling scheme: Investigate
  - 1/2 of fatal crashes
  - 1/3 of non-fatal crashes

- Suppose 100 crashes occurred
  - 10 fatal
  - 90 non-fatal
  - Hence, true fatality risk is $P=\frac{10}{100}=10\%$

- Database would include
  - 5 fatal
  - 30 non-fatal
  - Hence, unweighted fatality risk is $P=\frac{5}{35}=14\%$
Literature review

Sampling bias

Old data adjusted for bias

Less bias or adjusted for bias
Confusion

- Teichgräber (1983) → Yaksich (1964)
  - Only provided data, but no risk analysis
  - Ashton et al. (1977) specifically pointed out bias in the data
- Pasanen (1992) fitted a risk curve to ”Ashton’s” biased data
Pasanen’s approach

- Consider car TRAVEL speed
- Focus on the RELATIVE risk increase
Conclusions

- A correct understanding of exposure of crashes and injury risks is needed to save and protect as many pedestrians as possible.
- Decreasing impact speed is very effective both at high and low speeds.

Incidence of fatal crashes, \( I(v) \)

Fatality risk (%)
Final word: Speed is dangerous

By decreasing speed where pedestrians are at risk, injuries will be prevented and lives will be saved.
Thanks for listening!
References


