RISK BY TRAVEL MODE, GENDER AND AGE

Dr Shaun Scholes
on behalf of
Robel Feleke, Malcolm Wardlaw, & Jennifer Mindell

Road Safety Workshop
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Introduction

- Cycling is perceived as an unsafe travel mode in many countries.
- However, road deaths in England have fallen sharply since 2007.
- We explored whether differences in road traffic fatality rates by age, gender and mode persist, and the associations of deprivation with these, making ‘like-for-like’ comparisons.
METHODS
RATES = NUMERATOR / EXPOSURE
Method: Numerator data

ONS mortality data

- England
- 2007-2012
  - 3yr aggregated data: age-group & sex,
  - 6yr aggregated data: by age-group & IMD quintile
  - IMD of residence (not location of road crash)

- ICD-10 external codes
  - V10.3, V10.4 ... V18.9 Cyclist injured in traffic collision/non-collision
  - V01.1, V01.9 ... V09.9 Pedestrian injured in transport collision +
  - W00.4 … W19.4 Pedestrian injured in fall on-highway

Number of deaths to drivers

- (younger drivers) taken from STATS19
Method: Denominator data

National Travel Survey (NTS)

- Time spent travelling for each travel mode
- Travel diary
- Unit of analysis is *stage*: (trip>stage)
- Average **distance** travelled per person per week
- Average **time** spent travelling per person per week,
  - calculated using standard NTS methodology
  - i.e. amount of time spent driving is estimated amongst all NTS participants (it is **NOT** conditional on drivers)
- Annual mid-year population by age and sex each year
- NTS estimates aggregated to population
Statistical analysis

- **Outcomes:**
  Fatalities per billion km travelled ($f/\text{bn km}$): exposure as distance
  Fatalities per Million Hours Use ($F/\text{MHU}$): exposure as time

- **Estimates (numbers; fatality rates)**
  - by age-group* and IMD for 2007-2012
  - by travel mode: all modes; driving; cycling; walking

- **Statistical comparisons between IMD quintiles (most deprived vs least)**
  - Rate ratios (RR): no difference = 1

* Minimum age was 17+ (persons in charge of vehicle)
RESULTS
Changes over time 2007-09 to 2010-12

• **Number of deaths:**
  – 29% fall in Number of road travel deaths
  – Patterns by age-group and sex unaltered
  – Largest falls in groups with highest fatality rates

• **Fatality rates, all ages:**
  – Fell in each travel mode
  – except female cyclists (small reductions, NS)
Fatalities per million hours use by mode and sex: age 17-69 (2007-12)

- **Males**
  - Cyclist
  - Driver
  - Pedestrian

- **Females**
  - Cyclist
  - Driver
  - Pedestrian

- 95% CI
Fatalities per million hours use by mode and sex: aged 70+ (2007-12)
Fatalities per billion km by mode and sex, aged 17-69 (2007-12)

Males

Females

\[ \text{Fatalities per billion km} \]

\[ \text{by mode and sex, aged 17-69 (2007-12)} \]

\['\text{all ages} = 17+\]
Rate ratios for most vs least deprived areas of residence, by time spent travelling: a) all modes

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;17</td>
<td>0.20</td>
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<tr>
<td>17-24</td>
<td>1.00</td>
</tr>
<tr>
<td>25-34</td>
<td>5.00</td>
</tr>
<tr>
<td>35-44</td>
<td>&lt;17</td>
</tr>
<tr>
<td>45-54</td>
<td>17-24</td>
</tr>
<tr>
<td>55-64</td>
<td>25-34</td>
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<tr>
<td>65-74</td>
<td>35-44</td>
</tr>
<tr>
<td>75+</td>
<td>45-54</td>
</tr>
<tr>
<td>All Ages</td>
<td>55-64</td>
</tr>
</tbody>
</table>
Why we need to view road safety through a public health lens?

Transport poses a public health risk and the burden is greater on the poorest in society. There is a strong relationship between social class and the likelihood of road traffic injury. In 1990, the Black Report, published by the government department responsible for health in England, identified a strong socioeconomic gradient between child pedestrian fatalities and social class, with children from the lowest social class dying five times more often in the compared to those from the highest social class. The Black Report brought attention to the fact that this did not occur by chance.

While the death of an individual child may appear a random instance, the social dimorphism indicates the violation of the phenomenon (Townsend and Davidson, 1988, p. 171). Since then further research suggests the relationship between socioeconomic factors and injury persists and has been observed using ecological measures of deprivation for pedestrian casualties, older pedestrians and young drivers.

Identifying such health inequalities and associating policies to address them is a core state. To reduce child pedestrian casualties, a child pedestrian fatality database relating to road accidents have not been used to assess the effect of the road safety community largely because the existing database (STSCI) is used to inform road safety policy and practice does not routinely collect socioeconomic data. Furthermore, the data variables focused on what “accident” occurs, what harm occurs – at the end of the causal claim. For example, in the case of child pedestrian the event might be described in terms of active errors committed by the collision partners, such as failure of the child to look and see before the driver speed or design driving whilst impaired. However, little attention was given to upstream latent conditions that gave rise to these events such lack of adult supervision or failure of the road authorities. A lack of progress in preventing road injuries and implementing measures to reduce speed or enforce speed limits and drink drive legislation.
Strengths and limitations

• National, high quality data
  – Mortality data are complete, with rigorous QA
  – NTS: nationally-representative general population sample allowing estimation of actual time spent travelling

• Data quality:
  – Issues for walking (numerator and denominator)
  – Not able to quantify mode of travel exposure by type of road (i.e. motorways and non-motorways)
  – Comparisons between modes should account for deaths to other road users
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Co-authors:
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- Jennifer Mindell, UCL

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