Accident analysis and comparison of bicycles and pedelecs

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Introduction

Pedelec accidents in Germany over time

Gehlert et al. (2017). Accident analysis and comparison of bicycles and pedelecs, ICC Mannheim, 19-21 September Germany
## Methods

### Sample of police-reported accidents

<table>
<thead>
<tr>
<th>Federal state</th>
<th>Data since</th>
<th>Pedelec accidents</th>
<th>Bicycle accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baden-Württemberg</td>
<td>Jan12</td>
<td>1,592</td>
<td>31,129</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>Feb12</td>
<td>71</td>
<td>5,801</td>
</tr>
<tr>
<td>Saxony</td>
<td>March12</td>
<td>187</td>
<td>17,250</td>
</tr>
<tr>
<td>Hamburg</td>
<td>Sep12</td>
<td>152</td>
<td>5,664</td>
</tr>
<tr>
<td>Saxony-Anhalt</td>
<td>March13</td>
<td>43</td>
<td>6,770</td>
</tr>
<tr>
<td>Hesse</td>
<td>Apr13</td>
<td>335</td>
<td>10,918</td>
</tr>
<tr>
<td>Thuringia</td>
<td>Jul13</td>
<td>19</td>
<td>2,697</td>
</tr>
<tr>
<td>Bremen</td>
<td>Jan15</td>
<td>48</td>
<td>1,455</td>
</tr>
<tr>
<td>North Rhine-Westphalia</td>
<td>Jan15</td>
<td>11</td>
<td>487</td>
</tr>
<tr>
<td>No. of accidents</td>
<td></td>
<td>2,458</td>
<td>82,171</td>
</tr>
</tbody>
</table>

### Caution!
- per accident up to 3 persons involved
- at person level $N = 2,495$ pedelec cyclists and 87,800 bicyclists
Summary of results

Pedelec cyclists involved in an accident …

- Share similar accident characteristics as bicyclists (e.g. mostly in urban areas, mostly hit by car etc.)

But:

✓ are older than bicyclists,
✓ have a higher share of fatalities and severe injuries,
✓ have their accidents more often on the weekend,
✓ have a higher share of accident in rural areas,
✓ Higher share of accidents occur downhill.
✓ have more driving accidents / single accidents where they lose control over the vehicle, e.g. falls,
✓ the second most frequent cause of accident is inappropriate speed without exceeding the speed limit.

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Results

Age distribution

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Results

Accident severity (%)

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Results

Accident type by person mainly responsible

Gehlert et al. (2017). *Accident analysis and comparison of bicycles and pedelecs, ICC Mannheim, 19-21 September Germany*
Results

Accident site characteristics

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Conclusions

- Pedelec accidents are expected to further increase
- Controlling a pedelec might be more difficult than a bicycle
- Pedelec riders may cycle too fast given their ability to control the pedelec, especially the elderly

- Elderly pedelec cyclists are at risk
- There needs to be special pedelec training
- Self-protection is highly recommended (e.g. by wearing a helmet)
- Representative travel behaviour data is needed to calculate accidents risks

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Statements

- Bridging the gap between research and practice
  - Provides evidence for developing countermeasures:
    o areas of concern, e.g. pedelec cycling dynamics
    o target groups, e.g. elderly
  - Highlights research needs:
    o representative travel behaviour data

- Knowledge transfer to other countries to make cycling safer
  - Accident monitoring and analysis allows for evidence-based accident prevention measures
  - Do not wait until the problem appears in the accidents statistics
  - Observing new trends in travel behaviour and vehicle technology may help to identify traffic safety issues earlier on

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