Characteristics and causes of power two wheeler accidents in Europe

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Background

- More than 62,000 persons were killed in traffic accidents involving Powered Two Wheelers (PTWs), in the 27 European Union countries between 2001 and 2009.
- In these 27 countries there were -18% fewer PTW traffic accident fatalities in 2009 than in 2001 in comparison to -36% fewer fatalities in total (ETSC, 2011).
- PTW fatalities accounted for 16% of the total number of road accident fatalities in 2009 in the EU-24 countries.
- Age, gender and experience are among the parameters that considerably affect riders’ behavior.
- Road infrastructure is also an important factor related to PTW accidents.
Methodology

- Data used in this research were extracted from:
  - the CARE database of the European Commission with disaggregate data on road fatalities,
  - in depth road accident investigation surveys carried out within the SafetyNet EU-co-funded research project (2004-2008)

- Processing of these data took place within the Dacota EU co-funded research project (2010-2012)

- These results are regularly updated at the respective Basic Fact Sheets and published at the European Road Safety Observatory of the European Commission (www.erso.eu).
Motorcycle and moped rider fatalities per million inhabitants (2000 vs. 2009)
Index (2000=100) of motorcycle and moped fatalities compared with other modes EU-19, 2000-2009
Moped (left) and motorcycle (right) fatalities by age in 2000 and 2009 (for EU-19)
Motorcycle and moped fatalities per million inhabitants by age group - EU-24, 2009
Distribution of PTW fatalities by area and road type, 2009
Fatalities by junction type and mode of transport - EU-23, 2009
Distribution of specific critical events - PTW riders and other drivers/riders in PTW accidents

Specific Critical Event

- Surplus speed
- No action
- Premature action (initiated too early)
- Late action
- Incorrect direction (includes leaving road)
- Surplus force (excess acceleration or braking)
- Shortened distance (road user(s)/environment too close)
- Prolonged action/movement (continued on too long)
- Prolonged distance (action/movement taken too far)
- Insufficient speed
- Other

Proportion of drivers/riders

PTW riders  n=177
other drivers/riders in PTW accidents  n=140
### Ten most frequent links between causes - PTW riders

<table>
<thead>
<tr>
<th>Links between causes</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Others</td>
<td>63</td>
</tr>
<tr>
<td>Observation missed - Faulty diagnosis</td>
<td>5</td>
</tr>
<tr>
<td>Insufficient knowledge - Inadequate training</td>
<td>5</td>
</tr>
<tr>
<td>Faulty diagnosis - Communication failure</td>
<td>8</td>
</tr>
<tr>
<td>Inadequate plan - Psychological stress</td>
<td>8</td>
</tr>
<tr>
<td>Observation missed - Inattention</td>
<td>12</td>
</tr>
<tr>
<td>Observation missed - Inadequate plan</td>
<td>13</td>
</tr>
<tr>
<td>Observation missed - Permanent obstruction to view</td>
<td>16</td>
</tr>
<tr>
<td>Observation missed - Temporary obstruction to view</td>
<td>16</td>
</tr>
<tr>
<td>Inadequate plan - Insufficient knowledge</td>
<td>24</td>
</tr>
<tr>
<td>Faulty diagnosis - Information failure (driver/environment or driver/vehicle)</td>
<td>26</td>
</tr>
</tbody>
</table>
Conclusions (1/2)

- Powered two wheelers are a special group of road users, with increasing numbers and different needs and characteristics than other road users.

- During the decade (2000-2009) motorcycle rider fatalities (in EU-18) decreased by almost 2%, whereas the respective decrease for moped riders was more than 50%.

- Motorcycle is the only mode of transport for which number of fatalities increased over the period studied.

- The most significant reduction in the number of PTW fatalities during the decade (2000-2009) occurred in Portugal.

- In Romania, Latvia, Greece and Portugal far more PTW fatalities occurred inside urban areas than outside.
Conclusions (2/2)

- The findings presented in this paper could be used to shape public policy in a way that improves road safety, especially for the more vulnerable road users.

- Analyses using CARE disaggregate road accident data lead to results which do not always coincide with analyses using aggregate data.

- The use of statistical models is necessary for the identification of the combined correlation of the parameters with an impact on PTW safety.

- Data-collection is an on-going challenge and there are additional data that could help shed light to the problem of PTW road safety.
  - Of particular interest are exposure data (veh-kms, person-kms, vehicle fleet, etc.)
  - The macroscopic analysis presented in this paper could in the future be combined with in-depth analysis of intersection accident data
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