



MAIDS

In-Depth investigation of motorcycle accidents



The complete study is available on
<http://maids.acembike.org>

A REAL NEED TO INVESTIGATE THE NATURE AND THE CAUSES OF MOPED AND MOTORCYCLE ACCIDENTS

01 ▲ In these days of increasing congestion on our roads, powered two wheelers (PTWs) continue to provide a valuable contribution to mobility in Europe. Their relatively small size and low cost enable them to blend efficiently into the traffic flow while needing less space compared to other vehicles (OVs). However, PTW riders form one of the most vulnerable groups of road users and road accidents involving injuries to them are a major social concern. It is therefore essential that all parties work

together to understand and further improve the safety of this valuable mode of transport.

To this extend, the Association of European Motorcycle Manufacturers (ACEM) with the support of the European Commission and other partners conducted an extensive in-depth study of motorcycle and moped accidents during the period 1999-2000 in five sampling areas located in France, Germany, Italy, Netherlands and Spain. The methodology developed by the Organisation for Economic Co-operation and Development (OECD)

for on-scene in-depth motorcycle accident investigations was used by all five research groups in order to maintain consistency in the data collected in each sampling area.



MAIDS INVESTIGATED 921 ACCIDENTS AND 923 EXPOSURE CASES

04 ▲ A total of 921 accidents were investigated in detail, resulting in approximately 2000 variables being coded for each accident. The investigation included a full reconstruction of the accident; vehicles were inspected; witnesses to the accident

were interviewed; and, subject to the applicable privacy laws, with the full cooperation and consent of both the injured person and the local authorities, pertinent medical records for the injured riders and passengers were collected. From this data, all the human, environmental and vehicle factors which contributed to the outcome of the accident were identified.

To provide comparative information on riders and PTWs

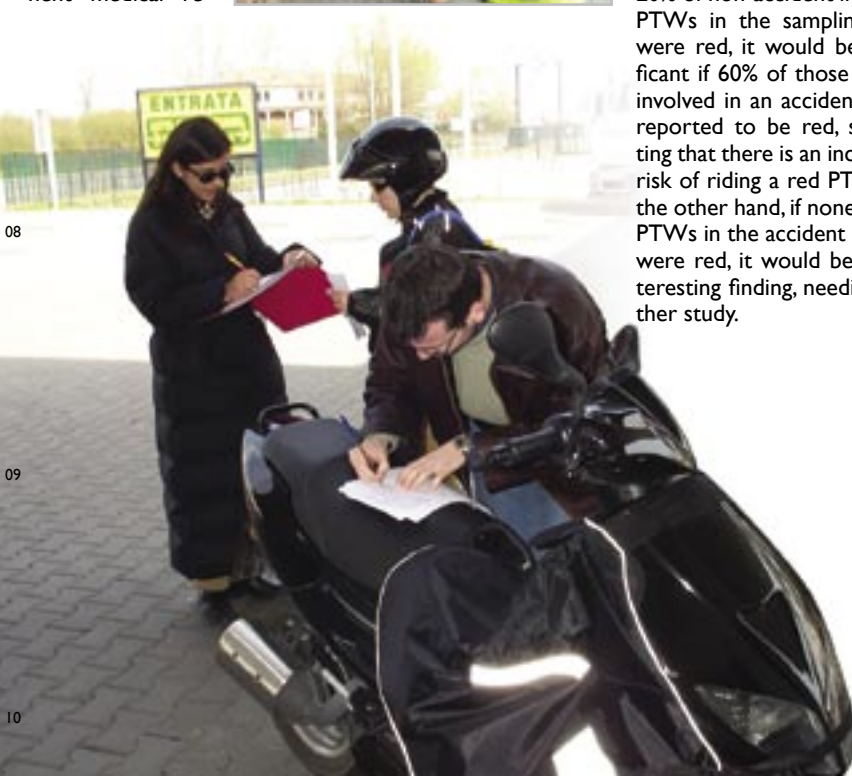
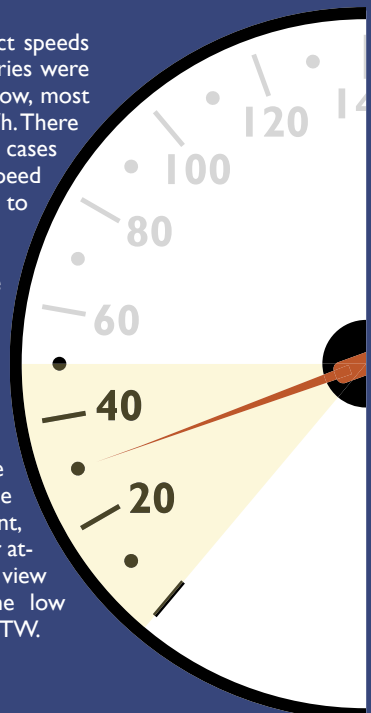
that were not involved in accidents in the same sample areas, data was collected in a further 923 cases. The collection technique was specifically developed to meet the circumstances of this study and is commonly referred to as an exposure or case-control study. This exposure information on non-accident involved PTW riders was essential for establishing the significance of the data collected from the accident cases and the identification of potential risk factors in PTW accidents. For example, if 20% of non-accident involved PTWs in the sampling area were red, it would be significant if 60% of those PTWs involved in an accident were reported to be red, suggesting that there is an increased risk of riding a red PTW. On the other hand, if none of the PTWs in the accident sample were red, it would be an interesting finding, needing further study.

FIRST EVIDENCES

The PTW accident data collected in this study indicated that the object most frequently struck in an accident was a passenger car. The second most frequently struck object was the roadway itself, either as the result of a single vehicle accident or of an attempt to avoid a collision with an OV. Whilst each sampling area contained both urban and rural areas, the majority of the accidents took place in an urban environment.

Travelling and impact speeds for all PTW categories were found to be quite low, most often below 50 km/h. There were relatively few cases in which excess speed was an issue related to accident causation.

The cause of the majority of PTW accidents collected in this study was found to be human error. The most frequent human error was a failure to see the PTW within the traffic environment, due to lack of driver attention, temporary view obstructions or the low conspicuity of the PTW.



STATISTICAL ANALYSIS IDENTIFIED RISK FACTORS

Once all the data had been collected, it was entered into a database for each sampling area and compared with the exposure data referred to above. Statistical analysis identified PTW accident risk factors by comparing the accident data to the exposure data.

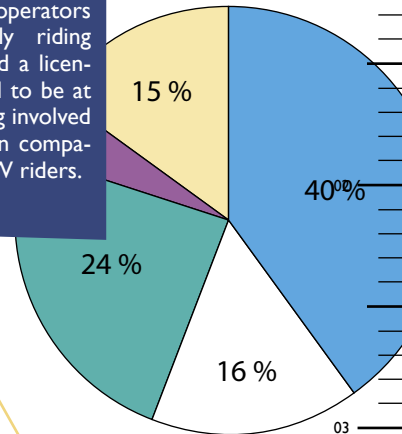
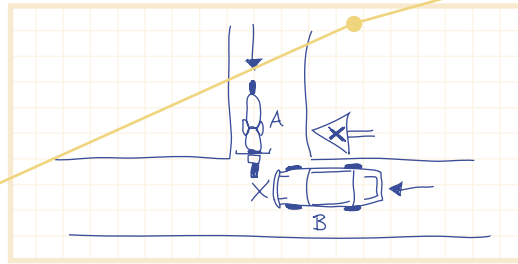
Thus, for example, the exposure data indicated that whilst scooters represented the majority of accident cases, scooters were not over-represented in accidents in comparison with their presence in the sampling area (i.e., their exposure).

FIRST EVIDENCES

When the accident riders were compared to the exposure population, the data demonstrated that the use of alcohol increased the risk of being in an accident, although the percentage was lower than in other studies.

Unlicensed PTW operators who were illegally riding PTWs that required a licence, were also found to be at greater risk of being involved in an accident when compared to licenced PTW riders.

European Communities 2004



THE MOST RECENT AND COMPREHENSIVE IN-DEPTH STUDY IN EUROPE

The data collected during this study represents the most comprehensive in-depth data currently available for PTW accidents in Europe. It is expected that this data will provide much needed information for developing future research in relation to public policy issues.



OUR PARTNERS

- The European Commission
- Federation of European Motorcyclists Associations
- Fédération Internationale de motocyclisme
- British Motorcyclists Federation
- Commission Internationale des Examens de Conduite Automobile



THE MAJOR FINDINGS OF MAIDS

The 921 on-scene, in-depth accident investigations have provided a large volume of data related to the general characteristics of PTW accidents; including accident causation and rider and passenger injury information. The outcome of these investigations can be considered in the identification, development and introduction of countermeasures.

The major findings of this study are as follows:

- In 37% of cases, the primary accident contributing factor was a human error on the part of the PTW rider. In some situations, the human errors that occurred involved skills that were beyond those that typical drivers or operators might currently have. This is often due to the extreme circumstances of some of the accident cases, including an insuffi-

cient amount of time available to complete collision avoidance.

- Among the secondary contributing factors, PTW riders failed to see the other vehicle (OV) and they also made a large number of faulty decisions, i.e., they chose a poor or incorrect collision avoidance strategy.
- In 13% of all cases, there was a decision failure on the part of the PTW rider.

The number of cases involving alcohol use among the PTW riders was less than 5%, which is low in comparison to other studies, but such riders were more likely to be involved in an accident.

In comparison to the exposure data, unlicensed PTW riders, illegally operating a PTW for which a licence is required, have a significantly increased risk of being involved in an accident.



- PTW riders between 41 and 55 years of age were found to be under-represented, suggesting that they may have a lower risk of being involved in an accident when compared to other rider age categories.

- When compared with the exposure data, 18 to 25 year old riders were found to be over-represented.

- In 50% of cases, the primary accident contributing factor was a human error on the part of the OV driver.

- OV drivers holding PTW licences were less likely to commit a perception failure than those without a PTW licence, i.e., they did not see the PTW or its rider.

- In about 1/3 of accidents PTW riders and OV drivers failed to account for visual obstructions and engaged in faulty traffic strategies.

- Traffic control violations were frequently reported, in 8% of the cases for PTW riders and in 18% for OV drivers.

- Amongst the wide diversity of PTW accident and collision configurations that were observed in this study, not one configuration dominated.

- 90% of all risks to the PTW rider, both vehicular and environmental.

performance was observed by visual inspection in 17.8% of all moped cases. This value is lower than those reported in other studies. The exposure study only shows 12.3% of tampering.

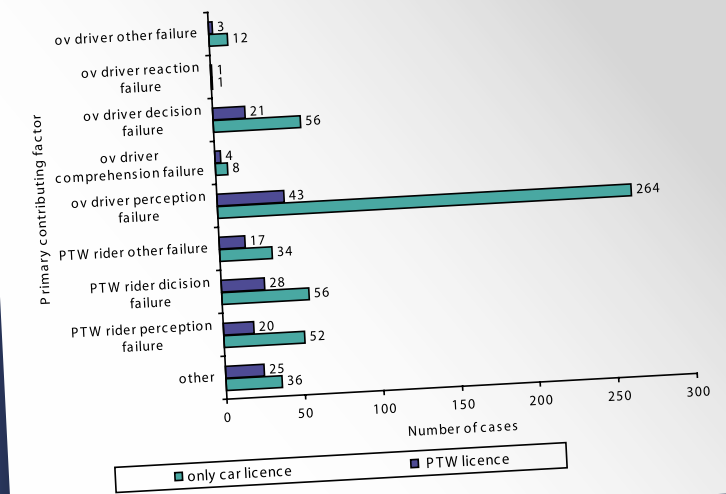
- Only modified conventional street motorcycles were found to be over-represented in the accident data. There was no evidence of an increased risk associated with riding any other PTW style.

- There were PTW technical problems in less than 1% of the accidents. Most of these were related to the tyres, illustrating the need for regular PTW inspections by the owner. There were no cases found by the teams in which an accident was caused by PTW design or manufacture.

- In over 70% of the cases the PTW impact speeds were below 50 km/h.

- In 18% of all cases, PTW travelling speeds were greater than or less than the surrounding traffic and this speed difference was considered to be a contributing factor.

- 73.1% of all PTW riders attempted some form of collision avoidance



- 55.7% of PTW rider and passenger injuries were to the upper and lower extremities. The majority of these were minor injuries, e.g. abrasions, lacerations and contusions. Appropriate clothing was found to reduce, but not completely eliminate, many of these minor injuries.

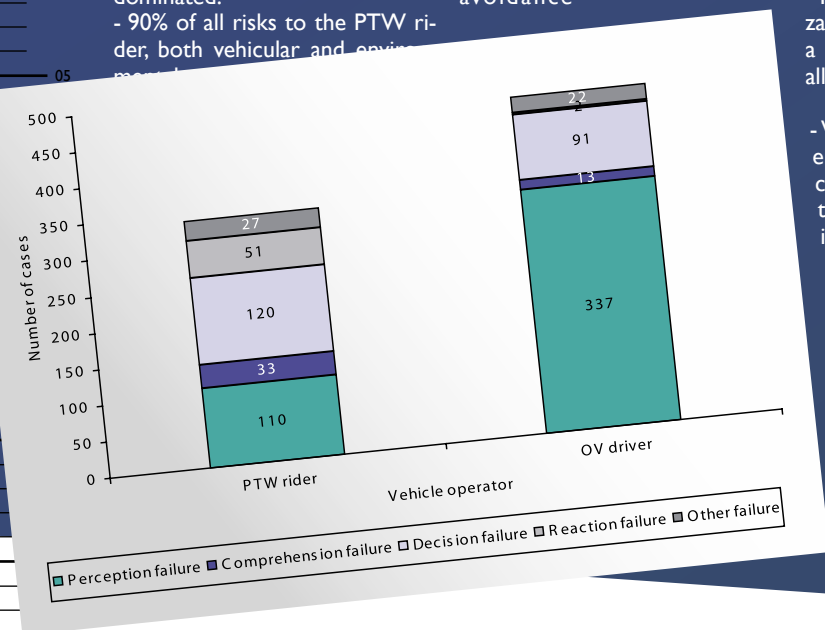
- Roadside barriers presented an infrequent but substantial danger to PTW riders, causing serious lower extremity and spinal injuries as well as serious head injuries.

- For PTW riders, a roadway maintenance defect caused the accident or was a contributing factor in 3.6% of all cases.

- For PTW riders, a traffic hazard caused the accident or was a contributing factor in 3.8% of all cases.

- Weather-related problems either caused the accident or contributed to accident causation in 7.4% of PTW accidents in the study.

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ASSOCIATION DES CONSTRUCTEURS EUROPEENS DE MOTOCYCLES

▲ ACEM, the motorcycle industry in Europe, represents the manufacturers of two- and three-wheel motor vehicles that are active in the European market. It also represents National Motorcycle Industry Associations and their members.

ACEM was created in 1994 by the merger of two Associations of manufacturers of motorised two-wheelers, namely:
 • COLIMO (Comité de Liaison de l'Industrie du Motocycle) established in 1962 and composed of eight national associations;

• ACEM (Association des Constructeurs Européens de Motocycles) founded in 1990 by the eight main European companies in the field.

ACEM supports the 50% casualties reduction in EU by 2010. ACEM members willingly take their share of the collective responsibility.

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