Evolution in motorcycle crashes and current crash characteristics in the OECD countries

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Background and Objectives

Background

- Rapid growth in the variety, sales, registrations, and activity of PTWs.
- Acceleration of growth due to economic, mobility and environmental sustainability benefits of PTWs.
- Growth in crashes, injuries and fatalities involving them.
- Benefits against societal costs to establish PTWs as viable transportation alternatives in a more health-conscious world.

Objective

- Analysis of the safety of PTWs in terms of crash, injury and fatality trends, typical injuries and crash characteristics.
Data Issues

**Fatality and injury data**

- Usage of fatality data from various databases (IRTAD, CARE, National databases).
- Analysis of serious injuries is essential for understanding PTWs’ safety issues
  - no common definition of serious injuries among countries
  - Underreported data

**Exposure data**

- Understanding motorcycles crashes require analysing crash and relating them to several exposure data
- Various indicators to assess risks of transport modes (vehicle – kilometers, passenger – kilometers, number of motorized vehicles, time spent in transport, etc.).
- Lack of exposure data on motorcycles.
Increase of total PTW fatalities in all OECD countries.

- Motorcyclists are between 8 to 40 times more likely to be killed in a traffic crash than car drivers (when related to the number of kilometres travelled).

Figure 1. Share of PTW fatalities in total fatalities in the OECD countries on 1999 and 2008
Trends in PTW Fatal Crashes

- Reduction by around 27% in the number of persons killed in traffic crashes in 2000-2009.
- Increasing trend for motorcycle users fatalities compared to trends for other modes of transport.

Figure 2: Motorcyclists and other road users killed in the three main regions of the OECD, and evolution of the fleet

Source: IRTAD, Note: OECD Asia Pacific includes: Australia, Japan, Korea and New Zealand
Effect of gender
- Share of male or female riders killed, follows the share of motorcyclists’ population.
- Heterogeneous epidemiological studies on impact of gender on accident severity.

Effect of rider age
- A shift in fatalities from the youngest age groups to middle-aged riders.
- The highest crash risk are the youngest age groups.
Effect of experience
- Inexperienced riders are often over-represented in motorcycle fatalities.
- Distinction between novice rider and young rider is important.

Monthly, Weekday and Hourly Periodic Trends
- PTW rider crashes, injuries and fatalities are correlated with periodic factors.
- Many fatalities in the summer & during the weekend.

Road Type, Area Type and Junctions
- Majority of PTW fatalities occur on non-motorway road network (rural roads).
- Almost one third of all PTW rider fatalities occur at junctions.
Impact of engine displacement

- PTW users with higher displacement have a higher risk of crash and a higher risk of being seriously injured.
- Motorcycle power is associated with accident severity (also related with the age of PTW user).

Serious injuries among motorcyclists

- Understanding the nature and extent of serious injuries among motorcyclists is essential in the perspective of a safe system approach.
- Motorcyclists sustain much more severe injuries, compared to other road users.
Motorcycle crash types:
- Single vehicle crashes (typically 20 - 45% of fatal crashes);
- Multi vehicle crashes (typically 30 – 50% of fatal crashes);
- Crash with a pedestrian (estimated less than 10% of fatal crashes).

Almost half of PTW crashes involved collision with another motor vehicle in transport on the same roadway.
Single – vehicle crashes

- Nearly half of single vehicle crashes of motorcycles were recorded as being originated by a loss of control
  - due to excessive speed, influence of alcohol, overbraking, etc.

- Other single – vehicle crashes are caused by a sudden meeting of an unexpected obstacle
  - animal who crosses the carriageway, obstacle on the carriageway, etc.
Multi – vehicle crashes

- 50% of PTW crashes involving a PTW and another vehicle, occur at junctions.
- A number of different configurations can be considered not at junctions
  - changing lane or overtaking, rear-end accident, aberrant manoeuver, etc.

Crashes with pedestrians

- 5-6% of PTW injury accidents involve a pedestrian
  - 3% for fatal accidents
In OECD countries, motorcyclists count for 14% of all road fatalities, while only representing 5% of the fleet.

Motorcyclist around 20 times more at risk than a car occupant.
- due to higher risk of severe injuries.

PTW trends are not following the overall fatalities decrease.
- due to increase in PTW fleet.

Being young, male and lacking experience is associated with increased PTW fatality risk.
Conclusions (2/2)

- One third of all PTW fatalities occur at junctions
  - counter measures for junction safety improvement for PTWs

- PTW fatalities more likely occur on weekends, between 3pm and 9pm from April to October.

- Majority of crashes are single vehicle crashes occurring on rural roads at intersections.

- Essential to gain more information on serious injuries.
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