

Newsletter No. 2

(March 2020)

Results from our road traffic accident data analysis

During its first year and half of life, the PIONEERS Project has analysed several European accident databases to understand the detailed characteristics of accidents involving powered two-wheelers (PTWs).

This in-depth study has allowed the PIONEERS Project to focus its efforts on the most frequent or most shocking situations for the motorists.

The first challenge was about defining the **scope of the analysis**. After internal discussions, the study includes accidents with outcome of killed or seriously injured casualties (KSY) where are L1 (mopeds) or L3 (motorcycles) vehicles involved. The analysis is also about single PTW accidents and accidents with two participants involving at least one PTW. Finally, the Project has established two use cases: Urban commute and leisure ride.

The summary is shown in the next table:

Accident Scenarios	Accidents with outcome of killed or seriously injured casualties (KSI)					
	Accidents with two participants involving at least one PTW				Single PTW accidents	
	L1 versus		L3 versus		L1	L3
	car	others	car	others		
Urban Use Case 1	AS1-U	AS2-U	AS3-U	AS4-U	AS5-U	AS6-U
Rural (w/o motorways) Use Case 2	AS1-R	AS2-R	AS3-R	AS4-R	AS5-R	AS6-R

The second challenge was **lack of homogenisation**. There are no standards in many aspects of motorcycle accidents and this has made research work difficult. Just one example: There are many definitions for body regions, but none is useful to identify deficiencies or measure improvements in PPE performance. As a result of PIONEERS Consortium deep working, the Project proposes a new standard.

(Find here more details: <http://pioneers-project.eu/body-regions/>)

Despite these difficulties, we are proud of the findings presented, some of which are below:

According to CARE (European Accident Scenarios):

- Most moped fatalities occurred in urban areas, whereas most motorcycle fatalities occurred in rural areas.
- Accident Scenario 3 (L3 vs car) is of highest importance, followed by AS6 (single L3 accidents and AS1 (L1 vs car). With that, CARE shows comparable results to those gained by the analysis at national level.

According to national statistics (France, Italy, Spain and Germany):

- Similar findings for these countries in Accident Scenarios 1-6
- Most frequent: AS3 (L3 vs passenger car) and AS6 (L3 single accidents)
- Accidents against passenger cars are dominant in rural and urban areas, with most occurring at intersections.

Regarding our in-depth data analysis, some findings are:

In terms of **collision parameters**:

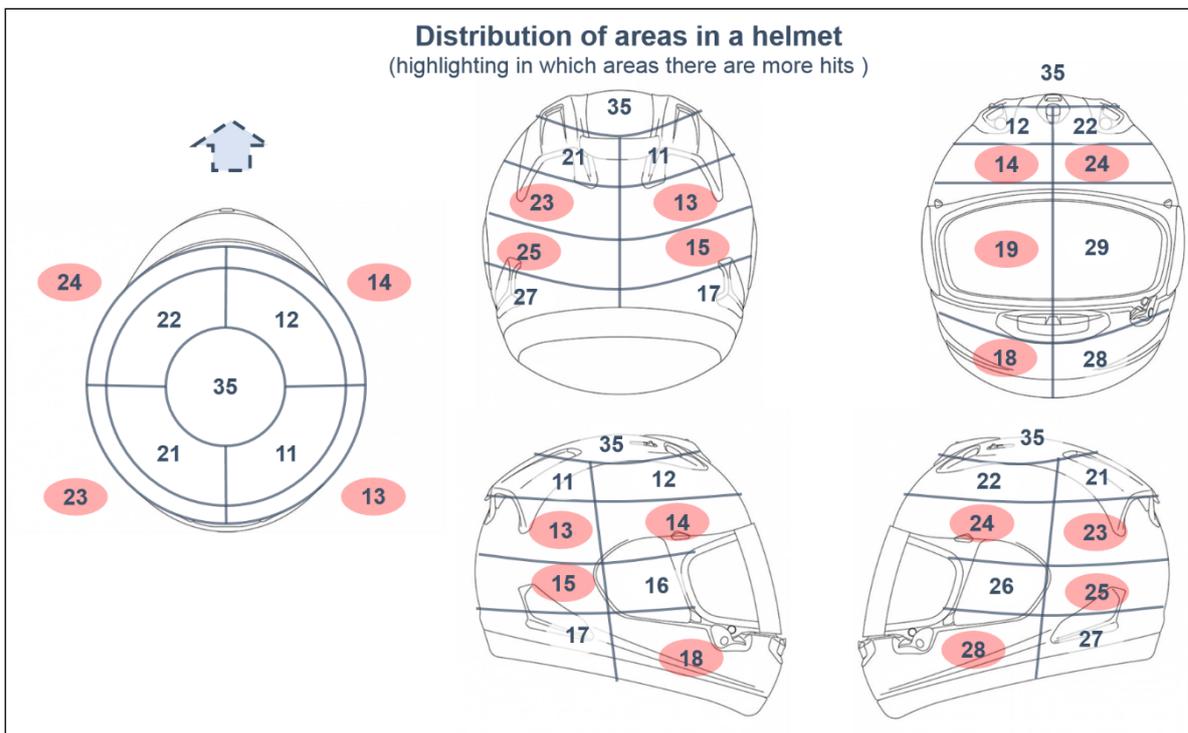
- Overall the passenger car impact speed was lower than the PTW impact speed.
- Fifty-one per cent of the PTWs showed a crash speed between 30-60 km/h.
- Seventy-one per cent of the Opponent Vehicles showed an impact speed between 0-25 km/h.

Regarding **the most common injuries**:

- The following four body regions can be highlighted throughout the analysed datasets: Thorax & Thoracic Spine, Head & Face, Upper Extremities and Lower Extremities.
- At least moderate injuries (AIS 2+) were most frequently found in the thorax (rib cage, lung, and haemothorax) and the brain.
- Abrasions of severity AIS 1 were most frequently found in the lower extremities, followed by the upper extremities.

With respect to **helmets performance**, the PIONEERS Project has also investigated which helmet areas more frequently show damage/contact points. From the analysis of the available data from France, Germany, Italy and Australia, some areas are hit more frequently as shown in the figure below:

Distribution of areas in a helmet
(highlighting in which areas there are more hits)



(Find here more details: <http://pioneers-project.eu/helmet-impacts/>)