

Traffic Safety Basic Facts 2018



Motorcycles and Mopeds



General

In 2016, about 25.600 people were killed in road accidents throughout the EU. Motorcycle and moped fatalities, together referred to as Powered Two Wheelers (PTW), accounted for 17% of those fatalities (18% in 2007). The two types of PTW will be discussed separately when possible, but some countries do not distinguish between motorcycles and mopeds.

In 2016, at least 663 riders (drivers and passengers) of mopeds were killed in the EU in accidents. As compared to 2007, this count has decreased by 57% for the set of countries in Table 1a.

Table 1a: Moped fatalities by country, 2007-2016

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BE	26	32	25	22	20	15	13	17	19	16
BG	-	9	5	5	10	4	6	8	11	-
CZ	3	2	9	7	7	7	6	8	6	1
DK	48	30	15	11	14	14	11	13	19	8
DE	100	110	99	74	70	93	73	87	62	68
EE	4	6	3	0	-	1	0	0	0	-
IE	-	-	-	-	-	-	-	-	-	-
EL	43	41	28	36	34	35	25	20	32	25
ES	233	181	156	99	73	67	56	54	56	54
FR	324	291	299	248	220	179	159	165	155	121
HR	20	27	15	15	10	16	14	11	14	10
IT	358	292	212	206	165	127	125	112	105	116
CY	8	8	4	3	3	3	0	4	2	2
LV	4	4	1	4	5	3	3	6	6	6
LT	-	-	-	-	-	-	4	1	3	-
LU	1	0	0	0	0	0	0	0	0	0
HU	31	26	23	19	31	25	24	17	27	16
MT	-	-	-	-	-	-	-	-	0	0
NL	60	51	47	32	36	40	41	32	35	34
AT	24	25	30	18	18	19	15	16	8	8
PL	59	87	68	83	87	82	62	71	65	77
PT	71	71	58	77	71	57	51	43	42	44
RO	81	150	122	114	87	99	39	30	34	33
SI	12	8	3	7	2	3	4	2	1	3
SK	-	-	-	-	-	-	-	-	-	-
FI	11	13	11	9	10	7	5	3	2	5
SE	14	11	11	8	11	8	3	8	5	8
UK	18	21	16	10	10	12	4	6	8	8
EU	1.552	1.496	1.260	1.107	994	916	743	734	717	663
Yearly Change		-4%	-16%	-12%	-10%	-8%	-19%	-1%	-2%	-8%
IS	0	0	0	0	1	0	0	0	0	0
NO	7	5	2	0	4	4	3	2	1	1
CH	7	9	8	4	4	3	8	1	3	6

Source: CARE database, data available in May 2018

Totals for EU countries include latest available data (data for Ireland, Lithuania and Slovakia not included in the totals)

In the EU, the number of moped rider fatalities decreased by 57% between 2007 and 2016.

In the EU the number of motorcycle rider fatalities decreased by about 38% between 2007 and 2016.

In 2016, at least 3.644 riders (drivers and passengers) of motorcycles were killed in the EU in road accidents. As compared to 2007 this count has decreased by about 38% for the set of countries in Table 1b.

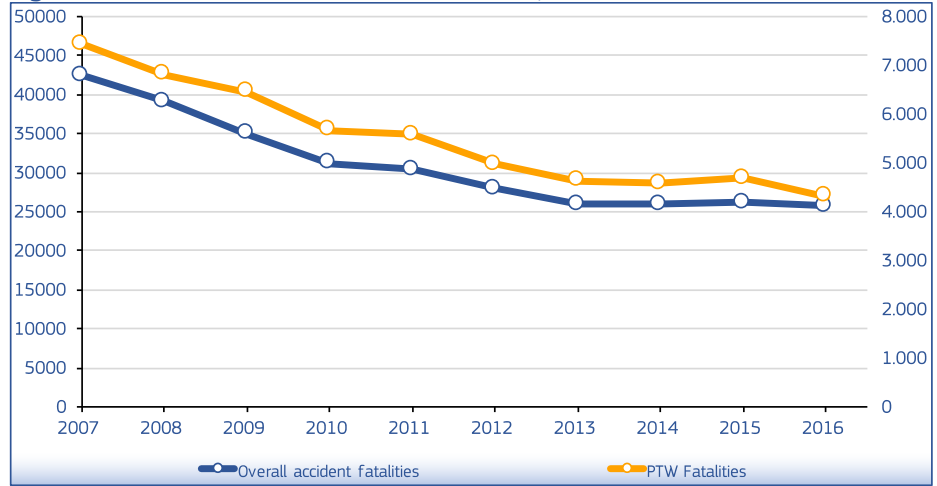
Table 1b: Motorcycle fatalities by country, 2007-2016

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BE	139	108	137	102	127	87	102	85	100	77
BG	-	67	48	42	35	48	49	47	50	-
CZ	136	121	85	92	77	86	66	88	91	62
DK	36	40	27	22	23	10	15	18	19	26
DE	807	656	650	635	708	586	568	587	639	536
EE	10	1	2	0	0	0	0	0	0	-
IE	33	29	25	17	18	19	26	24	-	-
EL	420	394	405	367	305	282	271	278	237	240
ES	640	484	437	386	348	304	302	287	329	343
FR	853	817	908	734	786	692	658	649	614	613
HR	96	100	81	51	76	62	49	44	58	38
IT	1.182	1.085	1.037	950	923	847	728	704	773	657
CY	16	16	19	18	13	11	15	9	13	10
LV	10	14	10	17	6	7	10	10	7	12
LT	-	-	-	-	-	-	15	13	13	-
LU	5	9	7	1	3	5	8	8	6	3
HU	112	91	73	49	52	39	58	58	50	48
MT	4	3	2	3	-	-	-	-	2	9
NL	64	67	68	60	50	53	29	51	43	44
AT	96	91	87	68	67	68	87	76	83	85
PL	215	262	290	259	292	261	253	237	208	244
PT	145	116	115	126	116	104	78	91	73	59
RO	73	90	74	59	69	62	52	45	55	46
SI	41	40	28	17	25	18	17	15	25	22
SK	54	39	34	27	-	-	-	-	-	-
FI	32	36	27	18	29	21	24	17	20	17
SE	60	51	47	37	46	31	40	31	44	36
UK	596	488	472	403	359	320	337	347	361	316
EU	5.821	5.276	5.161	4.533	4.556	4.026	3.859	3.821	3.937	3.617
Yearly Change		-9,3%	-2,2%	-12,2%	0,5%	-11,6%	-4,2%	-1,0%	3,0%	-8,1%
IS	3	1	2	1	0	0	1	0	1	2
NO	33	32	27	26	13	17	21	20	20	22
CH	82	83	78	68	68	74	55	53	66	43

Source: CARE database, data available in May 2018

Totals for EU include latest available data (Lithuanian and Slovakian data not included in the totals)

Figure 1: Distribution of road fatalities in the EU, 2007-2016

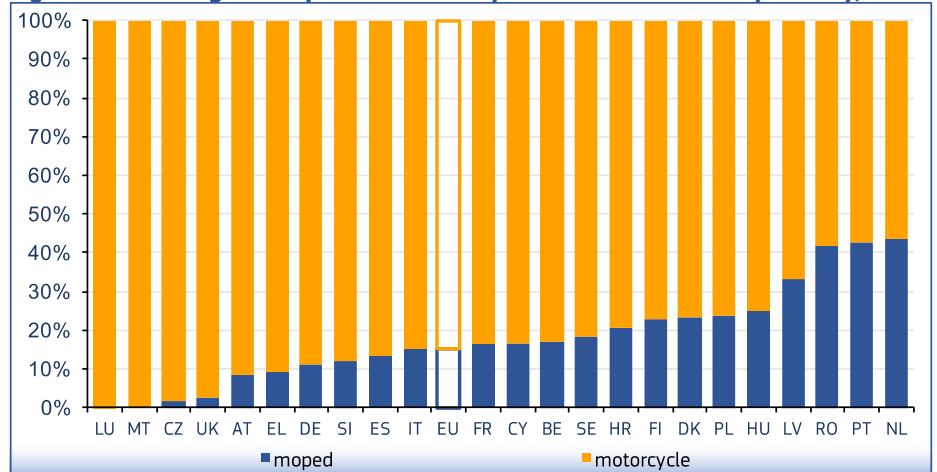


Source: CARE database, data available in May 2018

As there are no reliable data available about the exposure of PTWs (vehicle kilometres or fleet numbers) in most of the above countries, it is difficult to interpret the evolution of the PTW fatalities numbers or the difference in the distribution over mopeds and motorcycles. In some countries, like Czech Republic and Austria, the majority of PTW fatalities are motorcyclists (Figure 2). By definition in Ireland and the United Kingdom there are hardly any moped fatalities (for UK the distinction between mopeds and motorcycles takes place in the CADAS database. Additionally, scooters with engine size <50cc are not included, as they are counted with motorcycles. IE does not distinguish between motorcycles and mopeds. Mopeds are counted as motorcycles).

In most EU countries the majority of PTW fatalities are motorcycle riders.

Figure 2: Percentage of mopeds and motorcycles in PTW fatalities by country, 2016

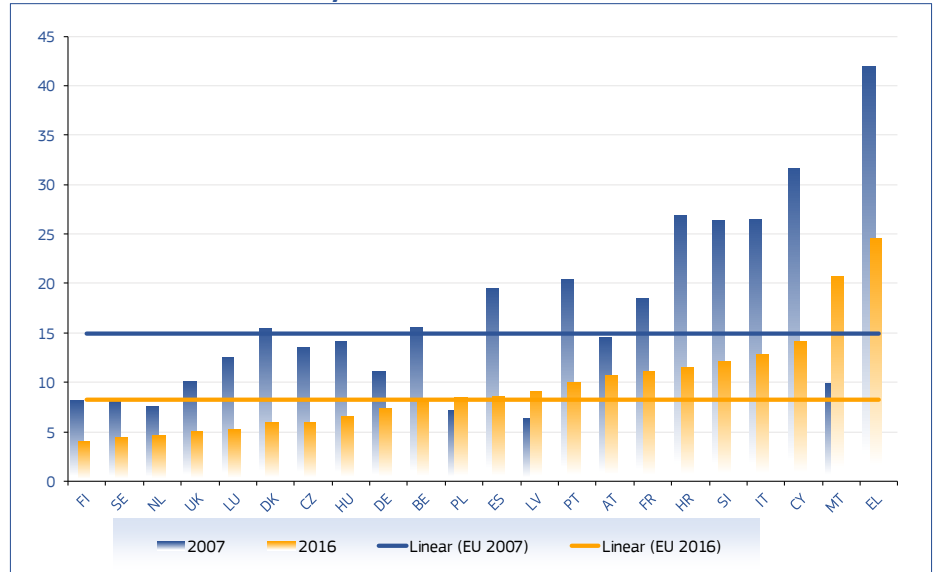


Source: CARE database, data available in May 2018

The fatality rate of PTW in 2016 is particularly high in Greece.

The most significant reduction in the number of motorcycle and moped fatalities between 2007 and 2016 occurred in Croatia, Greece and Cyprus.

Figure 3: Motorcycle and moped rider fatalities per million population in the EU, 2007 and 2016 or latest available year



Source: CARE database (EUROSTAT for population data), data available in May 2018

Figure 3 indicates that between 2007 and 2016 the fatality rate of PTW declined in most EU countries. Significant reductions occurred e.g. in Croatia, Greece and Cyprus, whereas the fatality rate increased in Latvia and Poland.

Table 2 shows the fatality rates of motorcycle and moped riders, defined as the number of fatalities per million population. Despite considerable improvements, the PTW fatality rates remain high in Greece and Cyprus.

Table 2 Fatality rate (per million population) of PTW riders by country, 2007-2016 or latest available year

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BE	15,6	13,1	15,1	11,4	13,4	9,2	10,3	9,1	10,6	8,2
BG	-	10,1	7,1	6,3	6,1	7,1	7,6	7,6	8,5	-
CZ	13,6	11,9	9,0	9,5	8,0	8,9	6,8	9,1	9,2	6,0
DK	15,4	12,8	7,6	6,0	6,7	4,3	4,6	5,5	6,7	6,0
DE	11,0	9,3	9,1	8,7	9,7	8,5	8,0	8,3	8,6	7,4
EE	10,4	5,2	3,7	0,0	0,0	0,8	0,0	0,0	0,0	-
IE	7,6	6,5	5,5	3,7	3,9	4,1	5,7	5,2	-	-
EL	42,0	39,3	39,0	36,2	30,5	28,6	26,9	27,3	24,8	24,6
ES	19,5	14,6	12,8	10,5	9,0	7,9	7,7	7,3	8,3	8,5
FR	18,5	17,3	18,8	15,2	15,5	13,3	12,5	12,3	11,6	11,0
HR	26,9	29,5	22,3	15,3	20,0	18,2	14,8	13,0	17,0	11,5
IT	26,4	23,5	21,2	19,5	18,3	16,4	14,3	13,4	14,4	12,7
CY	31,7	30,9	28,9	25,6	19,1	16,2	17,3	15,2	17,7	14,1
LV	6,3	8,2	5,1	9,9	5,3	4,9	6,4	8,0	6,5	9,1
LT	-	-	-	-	-	-	6,4	4,8	5,5	-
LU	12,6	18,6	14,2	2,0	5,9	9,5	14,9	14,6	10,7	5,2
HU	14,2	11,6	9,6	6,8	8,3	6,4	8,3	7,6	7,8	6,5
MT	9,9	7,4	4,9	7,2	-	-	-	-	4,7	20,7
NL	7,6	7,2	7,0	5,6	5,2	5,6	4,2	4,9	4,6	4,6
AT	14,5	14,0	14,0	10,3	10,1	10,3	12,1	10,8	10,6	10,7
PL	7,2	9,2	9,4	9,0	10,0	9,0	8,3	8,1	7,2	8,5
PT	20,5	17,7	16,4	19,2	17,7	15,3	12,3	12,9	11,1	10,0
RO	7,1	11,1	9,1	8,1	7,3	8,0	4,5	3,8	4,5	4,0
SI	26,4	23,9	15,3	11,7	13,2	10,2	10,2	8,2	12,6	12,1
SK	10,0	7,3	6,3	5,0	-	-	-	-	-	-
FI	8,1	9,2	7,1	5,0	7,3	5,2	5,3	3,7	4,0	4,0
SE	8,1	6,8	6,3	4,8	6,1	4,1	4,5	4,0	5,0	4,5
UK	10,1	8,3	7,9	6,6	5,9	5,2	5,3	5,5	5,7	5,0
EU	14,9	13,6	12,8	11,2	11,0	9,8	9,1	9,0	9,1	8,2
IS	9,8	3,2	6,3	3,1	3,1	0,0	3,1	0,0	3,0	6,0
NO	8,5	7,8	6,0	5,4	3,5	4,2	4,8	4,3	4,1	4,4
CH	11,9	12,1	11,2	9,2	9,1	9,7	7,8	6,6	8,4	5,9

Source: CARE database (EUROSTAT for population data), data available in May 2018

Map 1: PTW fatality rates per million population, 2016 or latest available year



In 2016, riders of PTW made up 17% of the total road accident fatalities in the EU.

Table 3: PTW rider fatalities as percentages of the total number of road accident fatalities by country, 2007-2016 or latest available year

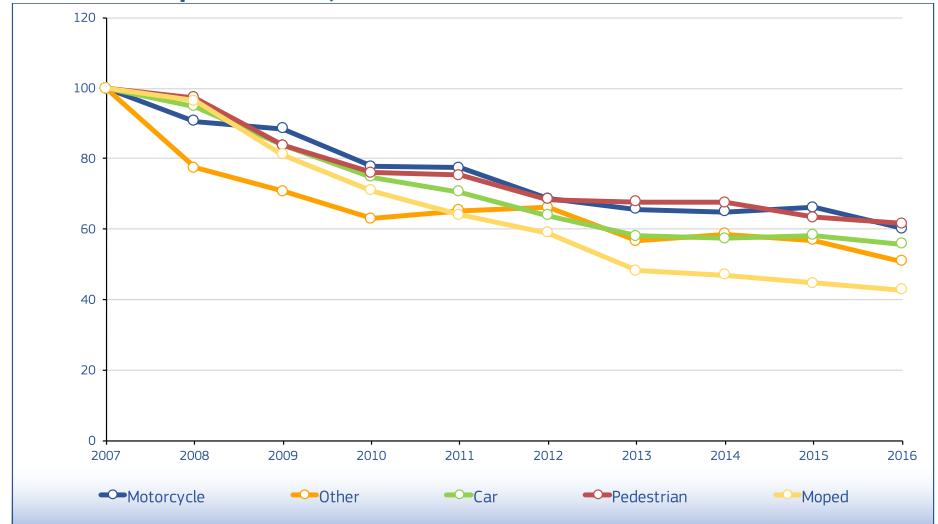
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BE	15%	15%	17%	15%	17%	13%	16%	14%	16%	15%
BG	-	7%	6%	6%	7%	9%	9%	8%	9%	-
CZ	11%	11%	10%	12%	11%	13%	11%	14%	13%	10%
DK	21%	17%	14%	13%	17%	14%	14%	17%	21%	16%
DE	18%	17%	18%	19%	19%	19%	19%	20%	20%	19%
EE	7%	5%	5%	0%	0%	1%	0%	0%	0%	-
IE	10%	10%	11%	8%	10%	12%	14%	12%	-	-
EL	29%	28%	30%	32%	30%	32%	34%	37%	34%	32%
ES	23%	21%	22%	20%	20%	19%	21%	20%	23%	22%
FR	25%	26%	28%	25%	25%	24%	25%	24%	22%	21%
HR	19%	19%	18%	15%	21%	20%	17%	18%	21%	16%
IT	30%	29%	29%	28%	28%	26%	25%	24%	26%	24%
CY	27%	29%	32%	35%	23%	27%	34%	29%	26%	26%
LV	3%	6%	4%	10%	6%	6%	7%	8%	7%	11%
LT	-	-	-	-	-	-	7%	5%	7%	-
LU	13%	26%	15%	3%	9%	15%	18%	23%	17%	9%
HU	12%	12%	12%	9%	13%	11%	14%	12%	12%	11%
MT	33%	33%	13%	23%	-	-	-	-	18%	39%
NL	17%	17%	18%	17%	16%	17%	15%	17%	15%	15%
AT	17%	17%	18%	16%	16%	16%	22%	21%	19%	22%
PL	5%	6%	8%	9%	9%	10%	9%	10%	9%	11%
PT	22%	21%	21%	22%	21%	22%	20%	21%	19%	18%
RO	6%	8%	7%	7%	8%	8%	5%	4%	5%	4%
SI	18%	22%	18%	17%	19%	16%	17%	16%	22%	19%
SK	8%	6%	9%	7%	-	-	-	-	-	-
FI	11%	14%	14%	10%	13%	11%	11%	9%	8%	9%
SE	16%	16%	16%	17%	18%	14%	17%	14%	19%	16%
UK	20%	19%	21%	22%	19%	18%	19%	19%	20%	17%
EU	17%	17%	18%	18%	18%	17%	18%	18%	18%	17%
IS	20%	8%	12%	13%	8%	0%	7%	0%	6%	11%
NO	17%	15%	14%	13%	10%	14%	13%	15%	18%	17%
CH	23%	26%	25%	22%	23%	23%	23%	22%	27%	23%

Source: CARE database, data available in May 2018

Table 3 shows that in 2016 the number of PTW fatalities as a proportion of the national fatality total varied in the EU countries from 4% (Romania) to 32% (Greece).

Motorcycling is one of the modes of transport for which the number of fatalities decreased least between 2007 and 2016.

Figure 4: Index (2007=100) of motorcycle and moped fatalities compared with other modes of transport in the EU, 2007-2016



Source: CARE database, data available in May 2018

Figure 4 shows that motorcycle riders' fatalities (together with pedestrian fatalities) decreased least between 2007 and 2016.

In 2016, 88% of moped and 94% of motorcycle riders fatalities were males.

Age and gender

Table 4 shows the distribution of motorcycle and moped rider fatalities by gender. As presented, the large majority of the PTW fatalities were males in all countries, however, with considerable variation among countries. In 2016, 12% of moped riders and 6% of motorcycle riders who were killed were females.

Table 4: Percentage of motorcycle and moped rider fatalities by gender and by country, 2016 or latest available year

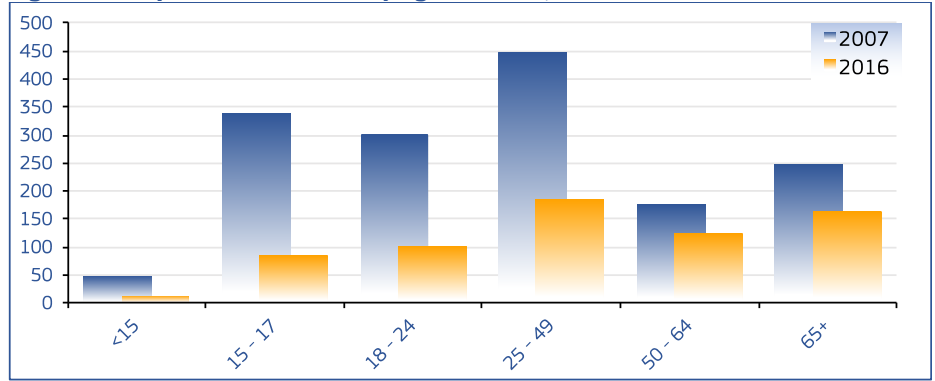
Gender	Moped		Motorcycle	
	Female	Male	Female	Male
BE	20%	80%	3%	97%
BG	0%	0%	0%	0%
CZ	0%	100%	2%	98%
DK	0%	100%	12%	88%
DE	15%	85%	9%	91%
EE	0%	0%	0%	0%
IE	0%	0%	4%	96%
EL	20%	80%	5%	95%
ES	13%	87%	8%	92%
FR	13%	87%	6%	94%
HR	0%	100%	11%	89%
IT	14%	86%	5%	95%
CY	50%	50%	0%	100%
LV	0%	100%	0%	100%
LT	33%	67%	8%	92%
LU	0%	0%	0%	100%
HU	6%	94%	4%	96%
MT	0%	0%	11%	89%
NL	21%	79%	2%	98%
AT	13%	88%	9%	91%
PL	8%	92%	6%	94%
PT	11%	89%	7%	93%
RO	6%	94%	2%	98%
SI	0%	100%	5%	95%
SK	0%	0%	0%	100%
FI	0%	100%	6%	94%
SE	0%	100%	0%	100%
UK	13%	88%	4%	96%
EU	12%	88%	6%	94%
IS	0%	0%	0%	100%
NO	0%	100%	0%	100%
CH	0%	100%	9%	91%

Source: CARE database, data available in May 2018

The least decrease of moped rider fatalities between 2007 and 2016 was in the 50-64 years old age group and in the under 15 years old age group.

Despite an overall downward trend, the number of motorcycle rider fatalities increased for riders older than 50 years.

Figure 5a: Moped rider fatalities by age in the EU, 2007 and 2016



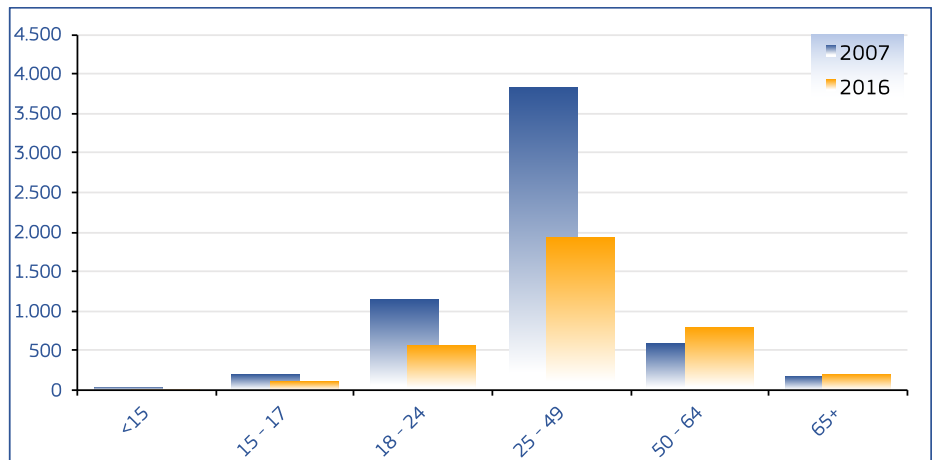
Source: CARE database, data available in May 2018

The numbers of moped and motorcycle rider fatalities by age group in 2016 are presented in Figures 5a and 5b respectively in comparison with those of 2007.

Figure 5a shows that the number of moped rider fatalities fell between 2007 and 2016 for all ages.

The number of motorcycle rider fatalities fell between 2007 and 2016 for all age groups shown - except the 50+ group (Figure 5b).

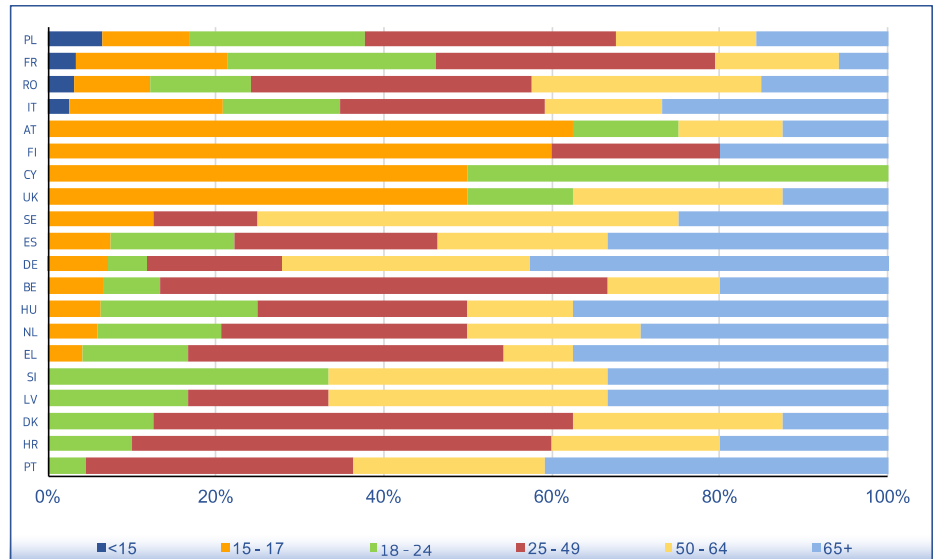
Figure 5b: Motorcycle rider fatalities by age in the EU, 2007 and 2016



Source: CARE database, data available in May 2018

The enormous differences between countries in the age pattern of PTW fatalities indicate differences in the modal split for certain age groups, e.g. the 65+ moped riders.

Figure 6a: Percentage of moped rider fatalities by age group in the EU, 2016



Source: CARE database, data available in May 2018

Figure 6b: Percentage of motorcycle fatalities by age group in the EU, 2016

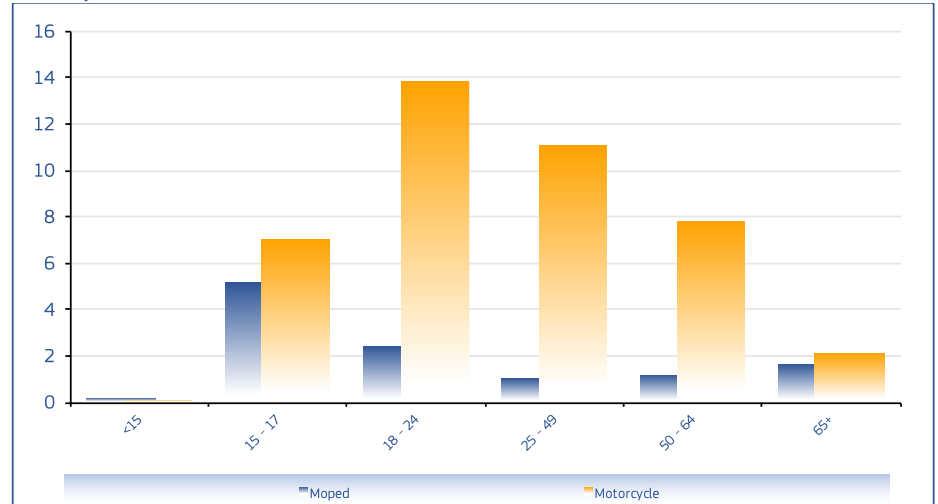


Source: CARE database, data available in May 2018

Figures 6a and 6b show the fatality rate for moped and motorcycle riders by age group in the EU by country. The enormous differences between countries indicate differences in the modal split for certain age groups, e.g. the 65+ moped riders.

The fatality rates for PTWs' users are high especially for young riders, aged 15-17 for moped riders and aged 18-24 for motorcycle riders.

Figure 7: Motorcycle and moped fatality rates per million population by age group in the EU, 2016



Source: CARE database (EUROSTAT for population data), data available in May 2018

Figure 7 shows the fatality rate by age group in the EU. The rates for moped riders aged 15-17 and motorcycle riders aged 18-24 are particularly high.

For motorcycles, the half of female riders who were killed were passengers; for mopeds almost 8 out of 10 female riders who were killed were drivers.

Table 5: Driver and passenger fatalities on motorcycle and mopeds by country, 2016 or latest available year

	Female		Male		Total	% Driver	% Passenger
	Driver	Passenger	Driver	Passenger			
BE	5%	0%	91%	3%	91	97%	3%
BG	-	-	-	-	61	-	-
CZ	2%	0%	98%	0%	63	100%	0%
DK	3%	6%	91%	0%	34	94%	6%
DE	7%	2%	89%	1%	604	97%	3%
EE	-	-	-	-	0	-	-
IE	4%	0%	92%	4%	24	96%	4%
EL	2%	5%	90%	3%	265	92%	8%
ES	3%	5%	91%	1%	397	94%	6%
FR	4%	3%	91%	2%	734	95%	5%
HR	0%	8%	85%	6%	48	85%	15%
IT	3%	3%	91%	3%	773	94%	6%
CY	8%	0%	92%	0%	12	100%	0%
LV	0%	0%	100%	0%	18	100%	0%
LT	0%	13%	75%	13%	16	75%	25%
LU	0%	0%	100%	0%	3	100%	0%
HU	3%	2%	94%	2%	64	97%	3%
MT	11%	0%	89%	0%	9	100%	0%
NL	9%	0%	91%	0%	77	100%	0%
AT	4%	5%	90%	0%	93	95%	5%
PL	3%	3%	91%	3%	321	94%	6%
PT	6%	3%	90%	1%	103	96%	4%
RO	3%	1%	86%	10%	79	89%	11%
SI	4%	0%	96%	0%	25	100%	0%
SK	0%	0%	89%	11%	27	89%	11%
FI	5%	0%	95%	0%	22	100%	0%
SE	0%	0%	93%	7%	44	93%	7%
UK	3%	1%	95%	1%	324	98%	2%
Moped	10%	3%	85%	3%	663	95%	5%
Motorcycle	3%	3%	92%	2%	3.607	95%	5%
EU	4%	3%	91%	2%	4.270	95%	5%
IS	0%	0%	100%	0%	2	100%	0%
NO	6%	2%	92%	0%	49	98%	2%
CH	0%	0%	100%	0%	23	100%	0%

Source: CARE database, data available in May 2018

The highest proportion of passengers among PTW fatalities is in Lithuania (25%) and Croatia (15%) by comparison with other countries.

Area and road type

The majority of PTW fatalities in all countries occurred on non-motorways (mopeds are not allowed on motorways in most European countries). The majority of moped fatalities occurred in urban areas, whereas the majority of motorcycle fatalities occurred in rural areas.

Table 6: Motorcycle and moped rider fatalities by area, road type and country, 2016 or latest available year

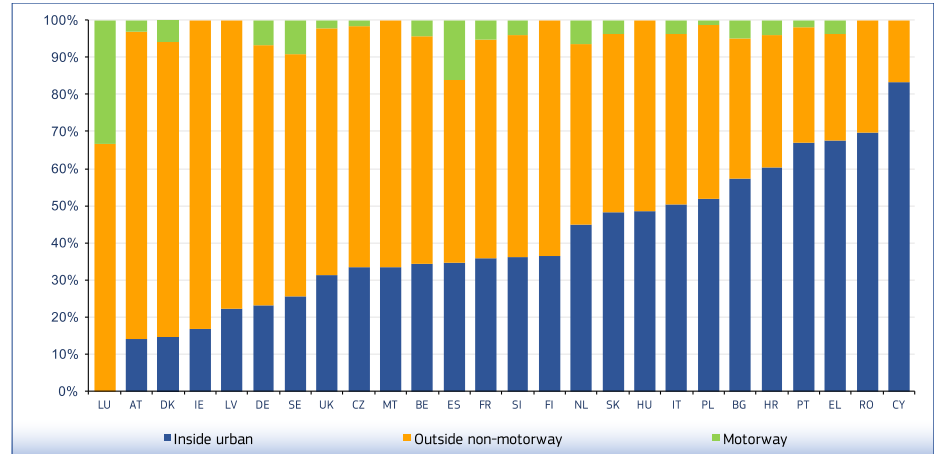
	Fatalities Moped					Fatalities Motorcycle				PTW fatalities as percentage of all fatalities by road type		
	Inside urban area	Outside urban area			Inside urban area	Outside urban area			Inside urban area	Outside urban area		
		Non motorway	Motorway	Unknown		Non motorway	Motorway	Unknown		Non motorway	Motorway	
BE	8	8	0	0	24	49	4	0	18%	16%	4%	
BG	9	2	0	0	26	21	3	0	13%	6%	5%	
CZ	0	1	0	0	21	40	1	0	10%	12%	3%	
DK	1	7	0	0	4	20	2	0	8%	23%	8%	
DE	38	30	0	0	101	395	40	0	14%	23%	10%	
EE	0	0	0	0	0	0	0	0	0%	0%	0%	
IE	0	0	0	0	4	20	0	0	7%	16%	0%	
EL	18	5	2	0	161	71	8	0	42%	22%	22%	
ES	28	24	2	0	109	172	62	0	26%	20%	20%	
FR	60	61	0	0	203	372	38	0	26%	20%	14%	
HR	7	2	1	0	22	15	1	0	16%	18%	6%	
IT	73	43	0	0	316	312	29	0	27%	23%	11%	
CY	1	1	0	0	9	1	0	0	29%	20%	0%	
LV	1	5	0	0	3	9	0	0	13%	11%	0%	
LT	0	0	0	3	0	0	0	13	-	-	-	
LU	0	0	0	0	0	2	1	0	0%	11%	20%	
HU	13	3	0	0	18	30	0	0	14%	10%	0%	
MT	0	0	0	0	3	6	0	0	21%	67%	0%	
NL	21	13	0	0	14	25	5	0	17%	16%	6%	
AT	2	5	1	0	11	72	2	0	12%	27%	9%	
PL	39	38	0	0	127	113	4	0	13%	9%	8%	
PT	35	9	0	0	34	23	2	0	23%	14%	5%	
RO	24	9	0	0	31	15	0	0	5%	3%	0%	
SI	2	1	0	0	7	14	1	0	21%	24%	4%	
SK	0	0	0	0	13	13	1	0	8%	7%	7%	
FI	3	2	0	0	5	12	0	0	13%	7%	0%	
SE	3	4	0	1	8	24	4	0	15%	17%	24%	
UK	4	4	0	0	97	212	7	0	16%	19%	8%	
Total EU	390	277	6	4	1.371	2.058	215	13	18%	17%	11%	
%	57,6%	40,9%	0,9%	0,6%	37,5%	56,3%	5,9%	0,4%	-	-	-	
IS	0	0	0	0	1	1	0	0	20%	8%	0%	
NO	0	1	0	0	4	18	0	0	15%	18%	0%	
CH	2	4	0	0	11	30	2	0	15%	31%	11%	

Source: CARE database, data available in May 2018

The majority of moped fatalities occurred in urban areas, whereas the majority of motorcycle fatalities occurred in rural areas.

The wide range in the distribution of PTW fatalities by area and road type mostly reflects the different share of mopeds and motorcycles in a country.

Figure 8: The distribution of PTW fatalities by area and road type in the EU, 2016 or latest available year



Source: CARE database, data available in May 2018

Figure 8 shows that there is a considerable variation in the EU countries in the distribution of PTW fatalities by area and road type.

Junction type

Table 7 indicates that less than a quarter of all motorcycle and moped rider fatalities occurred at a junction (22%). The respective figure for car occupant fatalities occurring at a junction is only 12%.

Within junctions, most motorcycle and moped fatalities occurred at T or staggered junctions and crossroads.

Table 8 indicates that the majority of fatalities occurred away from junctions for all transport modes. The highest proportions of fatalities at junctions are found for bicycles and powered two-wheelers.

Table 7: Motorcycle and moped occupant fatalities by junction type and by country in the EU, 2016 or latest available year

	Not at junction	Junction				Other	Unknown	Total
		Crossroad	Roundabout	T or staggered junction	Not at grade (interchange)			
BE	72%	0%	0%	0%	0%	17%	11%	93
BG	90%	0%	0%	0%	0%	0%	10%	61
CZ	75%	8%	0%	17%	0%	0%	0%	63
DK	76%	9%	0%	12%	0%	3%	0%	34
DE	72%	0%	0%	0%	0%	0%	28%	604
EE	0%	0%	0%	0%	0%	0%	0%	0
IE	0%	4%	0%	25%	0%	0%	71%	24
EL	91%	0%	0%	0%	0%	0%	9%	265
ES	69%	10%	7%	11%	0%	3%	0%	395
FR	81%	7%	1%	9%	0%	2%	0%	731
HR	75%	15%	0%	10%	0%	0%	0%	48
IT	71%	14%	2%	14%	0%	0%	0%	773
CY	50%	8%	0%	42%	0%	0%	0%	12
LV	94%	0%	0%	0%	0%	6%	0%	18
LT	81%	0%	0%	0%	0%	0%	19%	16
LU	100%	0%	0%	0%	0%	0%	0%	3
HU	72%	17%	0%	9%	0%	2%	0%	64
MT	56%	11%	0%	11%	0%	0%	22%	9
NL	73%	25%	1%	0%	0%	1%	0%	77
AT	83%	16%	0%	0%	0%	1%	0%	92
PL	74%	0%	0%	0%	0%	26%	0%	319
PT	72%	10%	0%	16%	3%	0%	0%	103
RO	84%	16%	0%	0%	0%	0%	0%	79
SI	88%	0%	0%	0%	0%	0%	12%	25
SK	70%	7%	0%	22%	0%	0%	0%	27
FI	77%	0%	0%	0%	0%	0%	23%	22
SE	70%	20%	9%	0%	0%	0%	0%	44
UK	56%	3%	3%	30%	0%	8%	0%	342
EU	73%	308	67	377	3	154	291	4.395
%	73%	7%	2%	9%	0%	4%	7%	100%
IS	50%	0%	0%	50%	0%	0%	0%	2
NO	0%	0%	0%	0%	0%	0%	100%	23
CH	0%	8%	0%	12%	0%	0%	80%	49

Source: CARE database, data available in May 2018

Table 8: Fatalities by junction type and mode of transport in the EU, 2016

	Not at junction	At junction	Unknown
pedestrian	78%	18%	5%
pedal cycle	63%	26%	12%
moped	71%	24%	5%
motor cycle	73%	20%	7%
car+taxi	85%	12%	3%
Lorry, under 3.5 tonnes	90%	9%	2%
Heavy goods vehicle	90%	8%	2%
Other/Unknown	71%	23%	7%
EU all modes	79%	16%	5%

Source: CARE database, data available in May 2018

The highest percentage of fatalities occurring at junctions are found for cyclists and powered two-wheelers' riders.

More than two thirds of PTW fatalities occurred from April to September.

Seasonality

Table 9: Motorcycle and moped fatalities by month and by country, 2016 or latest available year

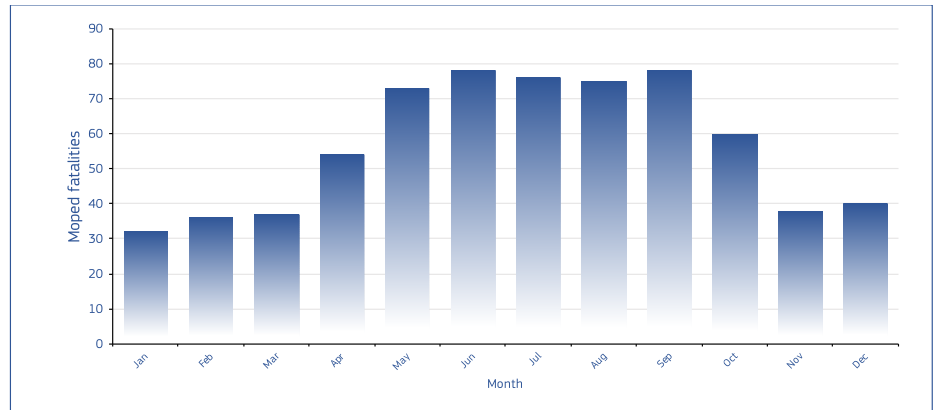
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
BE	2	6	7	6	13	7	13	17	7	6	6	3	93
BG	0	3	3	12	3	6	13	10	6	2	0	3	61
CZ	0	0	3	4	13	5	13	13	8	4	0	0	63
DK	1	0	1	3	6	5	3	8	5	2	0	0	34
DE	6	7	18	63	80	68	100	92	89	52	21	8	604
EE	0	0	0	0	0	0	0	0	0	0	0	0	0
IE	0	1	1	0	4	5	4	0	2	4	0	3	24
EL	15	17	15	28	28	18	35	27	20	30	20	12	265
ES	32	23	27	20	36	41	48	47	45	35	24	19	397
FR	29	41	56	49	94	70	104	86	86	57	27	35	734
HR	2	1	0	5	8	2	4	9	10	2	2	3	48
IT	28	37	46	55	76	93	134	103	80	54	35	32	773
CY	0	2	1	2	0	0	2	0	1	1	2	1	12
LV	0	0	1	2	2	3	3	2	4	1	0	0	18
LT	0	0	0	1	1	5	3	5	1	0	0	0	16
LU	0	0	0	0	0	0	1	2	0	0	0	0	3
HU	2	0	1	3	10	10	10	10	8	5	3	2	64
MT	1	1	0	0	0	1	1	0	2	1	2	0	9
NL	3	4	6	6	7	6	14	4	10	6	7	5	78
AT	0	2	6	8	5	12	23	14	17	5	0	1	93
PL	1	6	14	28	50	41	42	57	50	15	13	4	321
PT	2	9	7	8	8	11	11	12	13	11	3	8	103
RO	0	1	2	6	8	11	12	19	9	6	2	3	79
SI	0	0	4	4	4	0	3	6	2	0	0	2	25
SK	0	1	0	4	1	6	3	6	1	4	1	0	27
FI	0	0	0	2	4	2	4	4	4	1	0	1	22
SE	0	1	2	1	6	8	14	5	5	2	0	0	44
UK	9	12	26	27	37	28	34	30	48	33	25	15	324
Moped	32	36	37	54	73	78	76	75	78	60	38	40	677
Motorcycle	101	139	210	293	431	386	575	513	455	279	155	120	3.657
EU	133	175	247	347	504	464	651	588	533	339	193	160	4.334
%	3%	4%	6%	8%	12%	11%	15%	14%	12%	8%	4%	4%	100%
IS	0	0	0	0	1	0	1	0	0	0	0	0	2
NO	0	0	0	3	1	6	4	3	1	5	0	0	23
CH	0	0	1	5	4	8	5	8	9	5	3	1	49

Source: CARE database, data available in May 2018

As a reflection of the seasonal pattern of the use of mopeds and motorcycles the majority of PTW fatalities occurred during the more warm and dry months of the year.

The number of moped fatalities does not vary over the months as much as the number of motorcycle fatalities.

Figure 9a: Moped fatalities by month in the EU, 2016

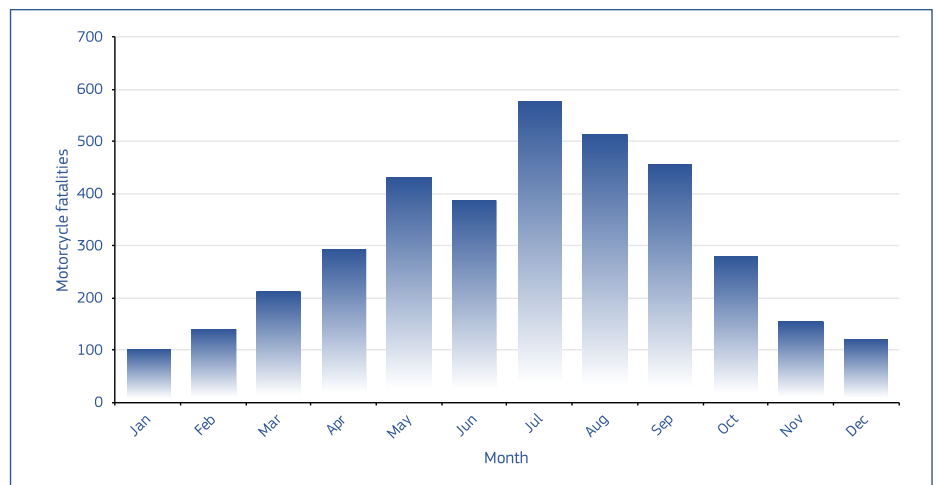


Source: CARE database, data available in May 2018

In Figures 9a and 9b the fatalities' annual distribution by month is displayed for mopeds and motorcycles, respectively.

The number of moped fatalities does not vary over the months as much as the numbers of motorcycle fatalities which display a more distinct break between the summer and the winter season (November to March).

Figure 9b: Motorcycle fatalities by month in the EU, 2016



Source: CARE database, data available in May 2018

Figure 9b confirms the seasonal pattern of motorcycle accidents, with most fatalities occurring from April to October.

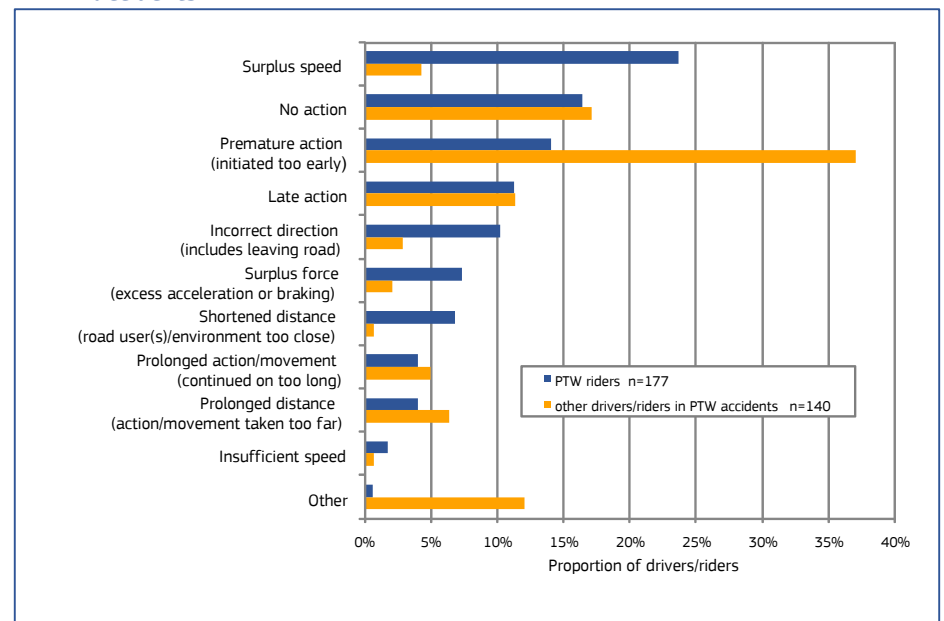
The most frequently recorded specific critical event for PTW riders is surplus speed.

Accident Causation

During the EC SafetyNet project, in-depth data were collected using a common methodology for samples of accidents that occurred in Germany, Italy, The Netherlands, Finland, Sweden and the UK¹². The SafetyNet Accident Causation Database was formed between 2005 and 2008 and contains details of 1.006 accidents covering all injury severities. A detailed process for recording causation (SafetyNet Accident Causation System – SNACS) attributes one specific critical event to each driver, rider or pedestrian. Links then form chains between the critical event and the causes that led to it. For example, the critical event of late action could be linked to the cause observation missed, which was a consequence of fatigue, itself a consequence of an extensive driving spell.

In the database, 17% (175) of the accidents involve the rider of a powered two wheeler (PTW – motorcycle or moped). Males account for 83% of this group and the mean age is 32 years old. Figure 10 compares the distributions of specific critical events for PTW riders and other drivers or riders in PTW accidents.

Figure 10: Distribution of specific critical events - PTW riders and other drivers/riders in PTW accidents



Source: SafetyNet Accident Causation Database 2005 to 2008 / EC; N=317
Date of query: 2010

The most frequently recorded specific critical event for PTW riders is surplus speed, very much in contrast to other drivers/riders in PTW accidents. Surplus speed describes speed that is too high for the conditions or manoeuvre being carried out, travelling above the speed limit and also if the rider is travelling at a speed unexpected by other road users.

¹ SafetyNet D5.5, Glossary of Data Variables for Fatal and Accident Causation Databases

² SafetyNet D5.8, In-Depth Accident Causation Database and Analysis Report

It is recognised that the PTW riders here are in a mix of single vehicle and multiple vehicle accidents, whilst the other drivers/riders are, by selection, in multiple vehicle accidents. Single vehicle accidents will be reflected in higher representations of surplus speed and incorrect direction (as it includes leaving the road).

The events under the general category of ‘timing’, no action, premature action and late action, account for the next three most frequent events after surplus speed. Premature action (one undertaken before a signal has been given or the required conditions are established, for example entering a junction too early) is recorded far more often for the other drivers/riders in PTW accidents than for the PTW riders.

Table 10 gives the most frequent links between causes for PTW riders. For this group there are 196 such links in total.

Table 10: Ten most frequent links between causes – PTW riders

Links between causes	Frequency
Faulty diagnosis - Information failure (driver/environment or driver/vehicle)	26
Inadequate plan - Insufficient knowledge	24
Observation missed - Permanent obstruction to view	16
Observation missed - Temporary obstruction to view	16
Observation missed - Inadequate plan	13
Observation missed - Inattention	12
Faulty diagnosis - Communication failure	8
Inadequate plan - Psychological stress	8
Observation missed - Faulty diagnosis	5
Insufficient knowledge - Inadequate training	5
Others	63
Total	196

Source: SafetyNet Accident Causation Database 2005 to 2008 / EC
Date of query: 2010

Faulty diagnosis, inadequate plan and observation missed are frequently recorded causes. Faulty diagnosis is an incorrect or incomplete understanding of road conditions or another road user’s actions. It is linked to both information failure (for example, a rider thinking another vehicle was moving when it was in fact stopped and colliding with it) and communication failure (for example, pulling out in the continuing path of a driver who has indicated for a turn too early).

The main cause leading to inadequate plan (a lack of all the required details or that the driver’s ideas do not correspond to reality) is lack of knowledge (for example, not understanding a complex junction layout), followed by psychological stress. The causes leading to observation missed can be seen to fall into two groups, physical ‘obstruction to view’ type causes (for example, parked cars at a junction) and human factors (for example, not observing a red light due to distraction or inattention).

13% of the links between causes are observed to be between ‘faulty diagnosis’ and ‘information failure.’

By 2012, thirteen member states routinely collected data in a sample of hospitals and contributed them to the EU injury Database.

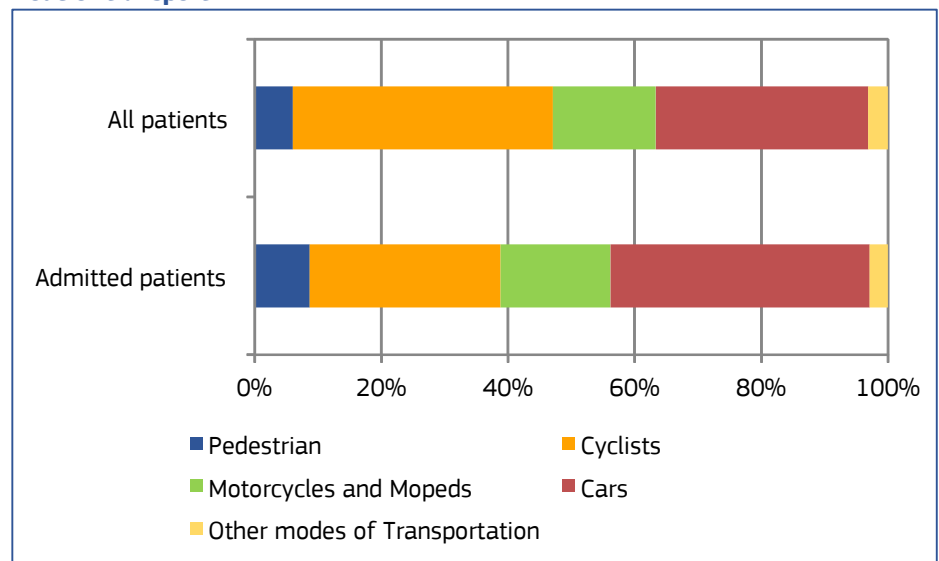
According to estimates based on the EU IDB more than four million people are injured annually in road traffic accidents, one million of whom have to be admitted to hospital.

Road Accident Health Indicators

Injury data can be obtained from a wide range of sources, such as police and ambulance reports, national insurance schemes, and hospital records, each of which provides a specific but yet incomplete picture of the injuries suffered in road accidents. In order to obtain a comprehensive view of these injuries, the EU Council issued a Recommendation that urges member states to use synergies between existing data sources and to develop national injury surveillance systems rooted in the health sector.³ At present, thirteen member states are routinely collecting injury data in a sample of hospitals and delivering these data to the Commission. This system is called the EU Injury Database (EU IDB).⁴

Within the EU IDB “transport module” road accidents are recorded by “mode of transport”, “role of injured person” and “counterpart”. These variables can complement information from police records, e.g. for injury patterns and improved assessment of injury severity (percentage of casualties admitted to hospital, the mean length of stay of hospital admissions, the nature and type of body part injured, and potentially also long term consequences of injuries).

Figure 11: Distribution of non-fatal road accident casualties attending hospital, by mode of transport



EU Injury Database (EU IDB AI) - hospital treated patients. IDB AI Transport module and place of occurrence (code 6.n [public road]); n-all = 73 600; n-admitted = 23.568 (DE, DK, LV, MT, AT, NL, SE, SI, CY, years 2005-2008).

Figure 11 indicates that vulnerable road users (pedestrians, cyclists, motorcycles and mopeds) accounted for almost two thirds (63%) of road accident casualties attending a hospital, and for over half of casualties admitted to a hospital (56%).

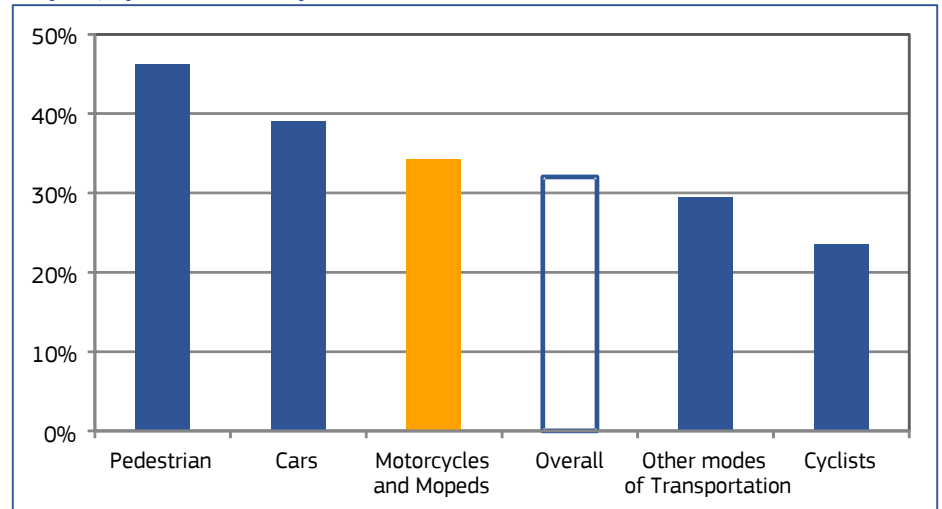
Figure 12 shows that overall 32% of road accident casualties recorded in the IDB were admitted to the hospital, compared with 34% of riders of mopeds and motorcycles. Figure 13 shows that the overall average

³OJ C 164/1, 18.7.2007

⁴<https://webgate.ec.europa.eu/sanco/heid/index.php/IDB>

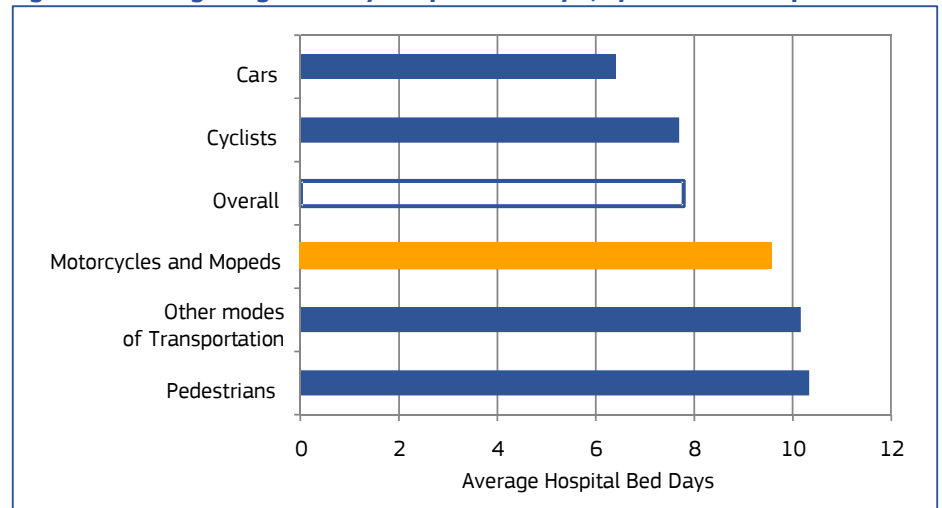
length of stay was eight days, compared with almost ten days for riders of mopeds and motorcycles.

Figure 12: Proportion of casualties who attended a hospital who were admitted to hospital, by mode of transport



EU Injury Database (EU IDB AI) - hospital treated patients. IDB AI Transport module and place of occurrence (code 6.n [public road]);n-all =73 600: n-admitted = 23.568 (DE, DK, LV, MT, AT, NL, SE, SI, CY, years 2005-2008).

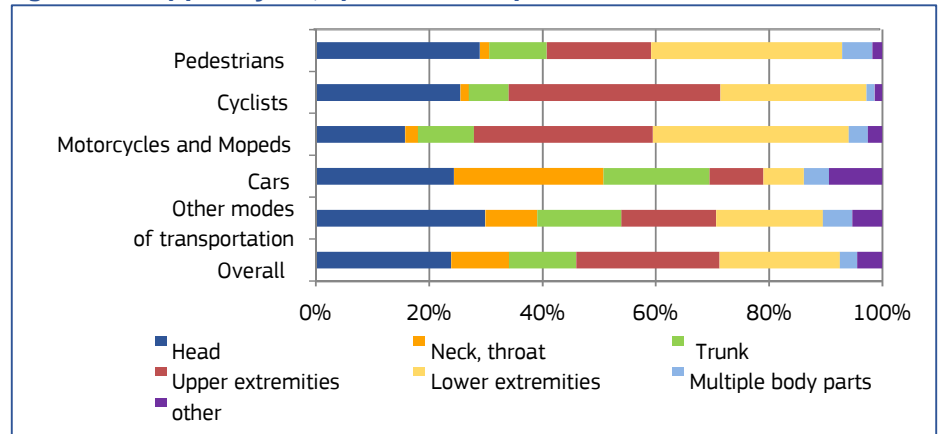
Figure 13: Average length of stay (hospital bed days), by mode of transport



EU Injury Database (EU IDB AI) - hospital treated patients. IDB AI Transport module and place of occurrence (code 6.n [public road]);n-all =73 600: n-admitted = 23.568 (DE, DK, LV, MT, AT, NL, SE, SI, CY, years 2005-2008).

34% of the moped & motor cycle casualties who attended a hospital were admitted to the hospital; their average stay in hospital was almost ten days.

Figure 14: Body part injured, by mode of transport



EU Injury Database (EU IDB AI) - hospital treated patients. IDB AI Transport module and place of occurrence (code 6.n [public road]);n-all =73 600: n-admitted = 23.568 (DE, DK, LV, MT, AT, NL, SE, SI, CY, years 2005-2008).

Naturally, hospital data can provide information on the injury patterns sustained by the accident victims. Figure 14 presents the distribution of body parts injured of the various road user types. Injured riders of mopeds and motorcycles, for example, suffered relatively many injuries to the lower extremities.

Table 11 shows the types of injury most frequently recorded in the EU IDB. It compares the distribution of injuries among riders of mopeds and motorcycles and all types of road users.

Table 11: Top ten types of injury in mopeds & motor cycles

	Mopeds & motor cycles	All road user groups
Contusion, bruise	26%	34%
Fracture	42%	27%
Open wound	10%	10%
Distortion, sprain	3%	8%
Concussion	6%	7%
Other specified brain injury	2%	2%
Luxation, dislocation	2%	2%
Injury to muscle and tendon	1%	2%
Abrasion	1%	1%
Injury to internal organs	1%	1%
Other specified types of injury	6%	6%
Total	100%	100%

EU Injury Database (EU IDB AI) - hospital treated patients. IDB AI Transport module and place of occurrence (code 6.n [public road]);n-all =73 600: n-admitted = 23.568 (DE, DK, LV, MT, AT, NL, SE, SI, CY, years 2005-2008).

Fractures account for more than 40% of all injuries inflicted on moped & motor cycle casualties attending hospital.

Notes

1. Country abbreviations

 Belgium	BE	 Italy	IT	 Romania	RO
 Bulgaria	BG	 Cyprus	CY	 Slovenia	SI
 Czech Republic	CZ	 Latvia	LV	 Slovakia	SK
 Denmark	DK	 Lithuania	LT	 Finland	FI
 Germany	DE	 Luxembourg	LU	 Sweden	SE
 Estonia	EE	 Hungary	HU	 United Kingdom	UK
 Ireland	IE	 Malta	MT		
 Greece	EL	 Netherlands	NL	 Iceland	IS
 Spain	ES	 Austria	AT	 Liechtenstein	LI
 France	FR	 Poland	PL	 Norway	NO
 Croatia	HR	 Portugal	PT	 Switzerland	CH

2. Sources: CARE (Community database on road accidents)

The full glossary of definitions of variables used in this Report is available at:

http://ec.europa.eu/transport/road_safety/sites/roadsafety/files/cadas_glossary_v3.pdf

3. Data available in May 2018.

4. Data refer to 2016 and when not available the latest available data are used (2010 data for SK, 2014 data for IE and 2015 data for BG, EE and LT). Totals and related average percentages for EU also include latest available data.

5. Data for Lithuania and Slovakia are not included in the totals of data comparing the years 2007-2016.

6. At the commenting of the tables and figures, countries with small figures are omitted.

7. This 2018 edition of Traffic Safety Basic Facts updates the previous versions produced within the EU co-funded research projects SafetyNet and DaCoTA.

8. Disclaimer

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9. Please refer to this Report as follows:

European Commission, Traffic Safety Basic Facts on Motorcycles & Mopeds, European Commission, Directorate General for Transport, June 2018.

