Traffic Safety Basic Facts 2010

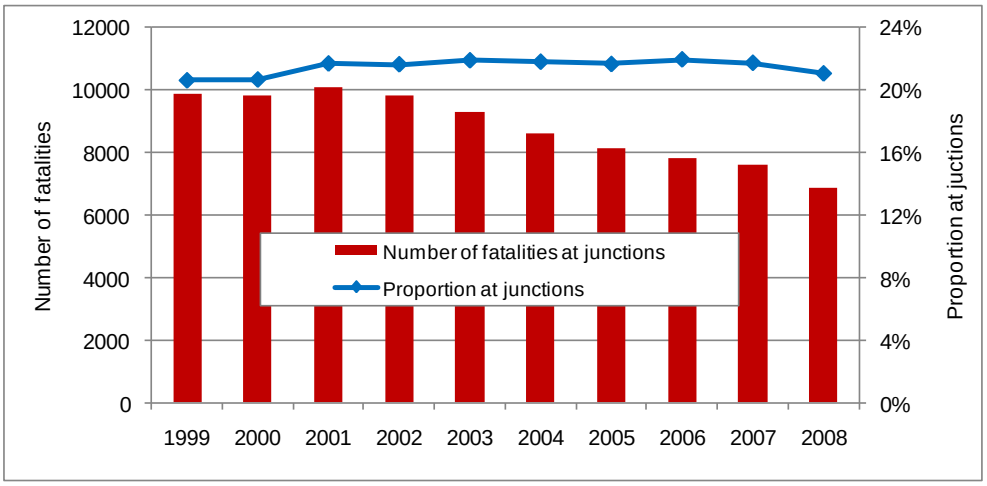
Junctions

It is estimated that about 8.300 people died in road traffic accidents at junctions in 2008 in the EU-22 countries listed in Table 1.

The fall in the number of fatalities at junctions over the past decade has broadly paralleled the fall for all fatalities.

Almost 10.500 people were killed in road traffic accidents at junctions in 18[1] EU member states in 1999, and the number fell by 30% by 2008. Figure 1 shows that slightly more than 20% of fatalities occurred at junctions throughout the decade, so the trend in junction accident fatalities broadly followed the trend in all fatalities.

Figure 1: Number and proportion of fatalities in EU-18 in road accidents at junctions [1]



Source: CARE Database / EC
Date of query: October 2010

Statistics related to junction accidents need to be treated carefully due to the presence of a high proportion of "unknown" entries in certain countries. The following countries had at least 10% of “unknown” entries between 1999 and 2008: IE (82%), SE (41%), DE (39%) and AT (27%).

Table 1 shows the annual data for individual countries. Note that for certain countries the actual numbers are somewhat higher than the reported numbers because for a significant number of accidents it is unknown whether or not they occurred at a junction. The number of fatalities reported for 2008 for the 22 countries in Table 1 is 7.242, but it is estimated that when account is taken of “unknown” entries then the actual number is 8.305.

[1] The country abbreviations used and definition of EU-level are shown on Page 15. Where a value is missing for an EU-18 country in a particular year, its contribution to the EU-18 total is estimated as the next known value.

Table 1: Number of fatalities in junction accidents per country, 1999-2008 [1] [2]

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BE	302	334	357	315	272	221	210	207	195	167
CZ	297	283	241	289	303	327	267	222	218	238
DK	155	150	122	130	128	122	94	101	129	126
DE	-	1.739	1.643	1.577	1.578	1.359	1.293	1.249	1.153	1.073
EE	-	-	-	-	-	-	33	38	54	38
EL	162	141	148	168	139	122	118	159	146	147
ES	930	914	856	805	806	764	750	754	721	577
FR	1.444	1.375	1.364	1.238	971	822	664	593	565	475
IT	1.354	1.528	2.013	2.000	1.837	1.761	1.674	1.654	1.550	1.372
LV	-	-	-	-	-	-	-	45	53	20
LU	2	11	8	8	11	8	3	3	7	8
HU	-	-	-	-	316	280	260	266	268	246
NL	404	401	327	321	324	247	249	276	253	227
AT	189	153	146	167	161	145	148	128	123	115
PL	-	-	934	934	983	1.014	898	768	840	834
PT	251	225	236	196	187	213	196	131	161	140
RO	53	59	71	94	64	61	236	238	272	269
SI	-	21	28	28	17	19	28	23	24	*24*
SK	-	-	-	-	-	-	72	75	61	70
FI	91	85	104	93	83	65	73	65	62	72
SE	171	155	155	171	115	125	98	99	115	97
UK	1.340	1.318	1.325	1.287	1.289	1.189	1.152	1.115	1.089	907
EU-18	9.839	9.826	10.077	9.821	9.269	8.584	8.151	7.785	7.623	6.868
Yearly reduction		0%	-3%	3%	6%	7%	5%	4%	2%	10%

Source: CARE Database / EC
Date of query: October 2010

The number of fatalities at junctions has fallen every year since 2002.

Table 2 shows the numbers as proportions of the fatality totals. Countries with at least 10% of “unknown” entries between 1999 and 2008 are excluded from the table. The proportions have all been calculated on the basis of known entries.

[2] The country abbreviations are shown on Page 15

The proportion of fatalities occurring at junctions varies widely across the EU.

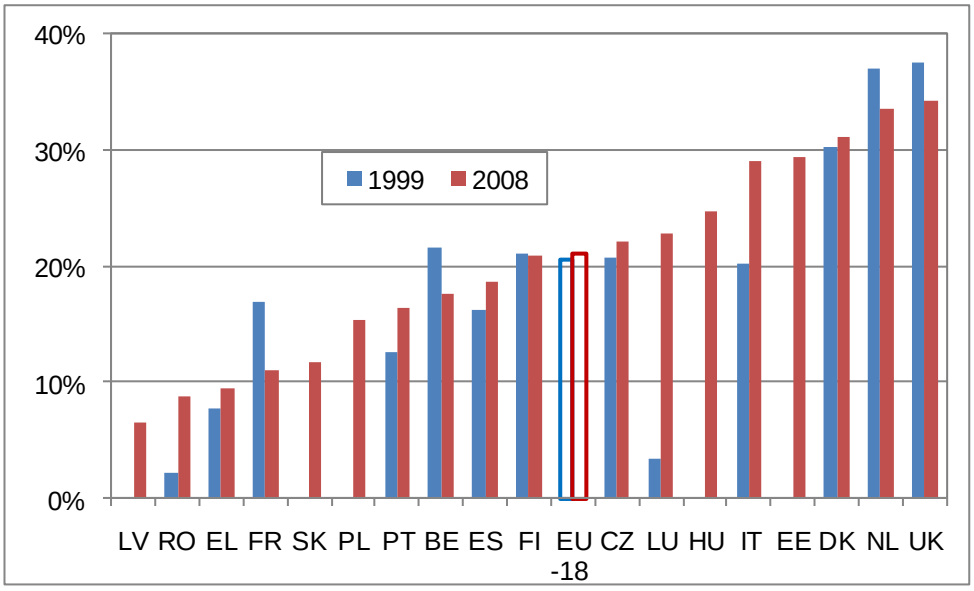
The proportion of fatalities occurring in road accidents at junctions has tended to fall in some countries, but to rise in others.

Table 2: Proportion of fatalities in junction accidents per country, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BE	22%	23%	24%	24%	22%	19%	19%	19%	18%	18%
CZ	21%	19%	18%	20%	21%	24%	21%	21%	18%	22%
DK	30%	30%	29%	28%	30%	33%	28%	33%	32%	31%
EE							22%	21%	31%	29%
EL	8%	7%	8%	10%	9%	7%	7%	10%	9%	9%
ES	16%	16%	16%	15%	15%	16%	17%	18%	19%	19%
FR	17%	17%	17%	16%	16%	15%	12%	13%	12%	11%
IT	20%	22%	28%	29%	28%	29%	29%	29%	30%	29%
LV								11%	13%	7%
LU	3%	14%	11%	13%	21%	16%	6%	7%	15%	23%
HU					24%	22%	20%	20%	22%	25%
NL	37%	37%	33%	33%	32%	31%	33%	38%	36%	34%
PL			17%	16%	17%	18%	16%	15%	15%	15%
PT	13%	12%	14%	12%	12%	20%	20%	17%	20%	16%
RO	2%	2%	3%	4%	3%	2%	9%	9%	10%	9%
SI		7%	10%	11%	7%	7%	11%	9%	8%	0%
SK								12%	9%	12%
FI	21%	21%	24%	22%	22%	18%	20%	20%	16%	21%
UK	38%	37%	37%	36%	35%	35%	35%	34%	36%	34%
EU-18	21%	21%	22%	22%	22%	22%	22%	22%	22%	21%

Source: CARE Database / EC
Date of query: October 2010

Figure 2: Proportion of fatalities in junction accidents per country, 1999 and 2008[1]



Source: CARE Database / EC
Date of query: October 2010

Type of Junction

Several types of junction are recorded in the CARE data, and Table 3 shows the data for 2008 (data for SI are for 2007 since, as shown in Table 1, the CARE data appear to show that were no fatalities at junctions in SI in 2008). Junction type is not available for several countries, and there are wide variations among the others.

When people die in road traffic accidents at junctions, crossroad is the most common type of junction.

Table 3: Number of fatalities in junction accidents, by type of junction per country, 2008

	Accidents at junctions					Accidents not at junctions	Not known	Total
	Cross-road	T or Y Junction	Round-about	Level Crossing	Other/ Unknown			
BE	0	0	5	1	161	777	0	944
CZ	101	108	0	28	1	836	2	1.076
DK	58	0	2	3	63	279	1	406
DE	906	0	0	63	148	1.561	1.799	4.477
EE	12	20	0	0	6	91	3	132
EL	0	0	0	0	147	1.406	0	1.553
ES	203	216	66	0	92	2.523	0	3.099
FR	189	128	41	30	87	3.800	0	4.275
IT	604	0	87	6	675	3.359	0	4.731
LV	0	0	0	0	20	285	11	316
LU	0	0	0	0	8	27	0	35
HU	196	0	0	40	10	750	0	996
NL	193	0	11	16	7	450	0	677
AT	75	23	2	15	0	410	154	679
PL	823	0	7	42	0	4.565	0	5.437
PT	50	68	8	8	6	713	32	885
RO	230	0	0	39	0	2.792	0	3.061
SI*	24	0	0	0	0	260	9	293
SK	33	35	2	0	0	528	8	606
FI	0	0	0	0	72	271	1	344
SE	85	0	1	0	11	5	295	397
UK	145	511	55	0	196	1.738	0	2.645
EU-22	3.927	1.109	287	291	1.709	27.425	2.315	37.064
Share	11%	3%	1%	1%	5%	74%	6%	100%

* data for 2007

Source: CARE Database / EC

Date of query: October 2010

Type of Road

The CARE data show whether or not each accident occurs on a motorway, and, if not, whether it occurs on an urban or rural road. Table 4 shows the number of fatalities on each road type per country, together with the proportion of fatalities occurring at junctions. The nineteen countries are those for which the reporting of junction accidents and road type is good in 2008 (2007 for SI).

The proportion of fatalities occurring at junctions is higher on urban roads than on rural roads or motorways.

Table 4: Distribution of fatalities at junctions per country by road type, 2008

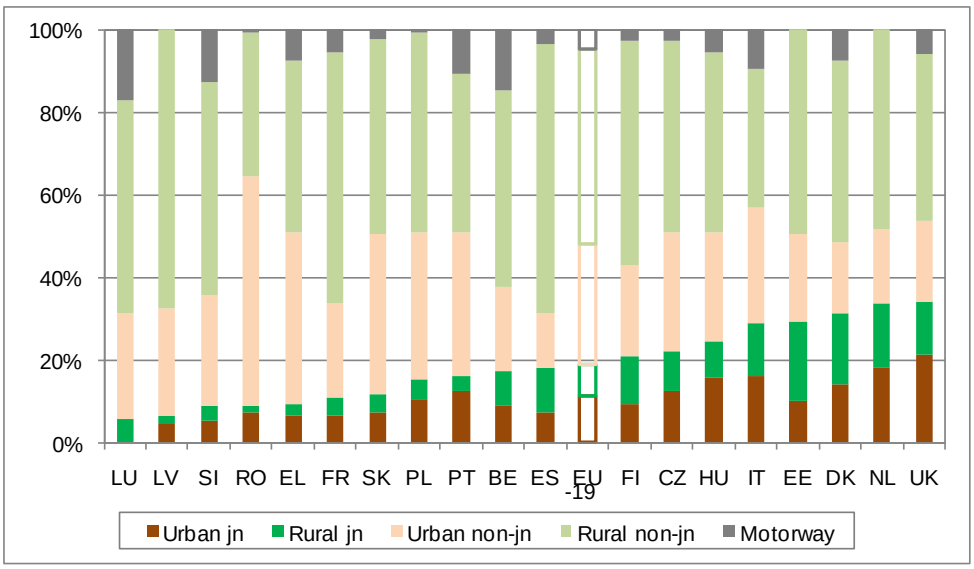
	Motorway		Non-motorway				All roads	
	Fatalities	% at junction	Rural Fatalities	% at junction	Urban Fatalities	% at junction	Fatalities	% at junction
BE	139	1%	531	15%	274	30%	944	18%
CZ	30	0%	602	17%	444	31%	1.076	22%
DK	31	0%	246	28%	129	45%	406	31%
EE	0		91	28%	41	33%	132	29%
EL	120	0%	689	7%	744	13%	1.553	9%
ES	109	11%	2.357	14%	634	37%	3.099	19%
FR	233	2%	2.807	7%	1.235	22%	4.275	11%
IT	452	0%	2.203	28%	2.076	37%	4.731	29%
LV	0		219	3%	97	15%	316	7%
LU	6		20	10%	9		35	23%
HU	54	6%	523	16%	419	37%	996	25%
NL	0		431	24%	243	50%	677	34%
PL	35	0%	2.903	9%	2.499	23%	5.437	15%
PT	96	2%	372	9%	417	26%	885	16%
RO	21	0%	1.121	5%	1.919	11%	3.061	9%
SI*	37	0%	162	6%	94	16%	293	8%
SK	14	0%	312	8%	280	16%	606	12%
FI	9		227	18%	108	30%	344	21%
UK	157	6%	1.401	24%	1.087	52%	2.645	34%
EU-19	1.542	2%	17.217	14%	12.749	27%	31.511	19%

* data for 2007
Percentages only for cells with at least 10 fatalities

Source: CARE Database / EC
Date of query: October 2010

Figure 3 illustrates this information. Countries are ordered by the overall proportion of fatalities at junctions.

Figure 3: Distribution of fatalities by road type and junction, 2008



Source: CARE Database / EC
Date of query: October 2010

Mode of Transport

Table 5 shows, of the fatalities recorded in CARE data as occurring at junctions, the distribution of fatalities by mode of transport. Table 6 then shows, of the fatalities recorded for each mode of transport the proportion that occurred at junctions. For example, 22 pedestrians were killed in Belgium at junctions, 13% of the 167 fatalities at junctions. 99 pedestrians were killed in total, so this represents 22% of pedestrian fatalities.

Over one third of fatalities at junctions were travelling by car or taxi.

Table 5: Distribution of junction fatalities per country by mode of transport, 2008

	Car or Taxi	Pedestrian	Motor Cycle	Pedal Cycle	Moped	Lorry	Other	Total
BE	38%	13%	20%	19%	5%	4%	1%	167
CZ	44%	21%	18%	12%	1%	3%	1%	238
DK	29%	13%	17%	26%	10%	4%	1%	126
EE	58%	24%	3%	5%	5%	3%	3%	38
EL	36%	24%	36%	1%	2%	1%	0%	147
ES	32%	19%	25%	3%	12%	6%	3%	577
FR	33%	19%	24%	9%	12%	2%	2%	475
IT	38%	10%	29%	10%	9%	1%	3%	1.372
LV	60%	40%	0%	0%	0%	0%	0%	20
LU	63%	38%	0%	0%	0%	0%	0%	8
HU	38%	27%	9%	17%	5%	3%	1%	246
NL	28%	8%	11%	37%	11%	1%	4%	227
PL	37%	39%	5%	12%	3%	2%	1%	834
PT	25%	15%	24%	8%	13%	12%	2%	140
RO	35%	37%	3%	10%	7%	4%	4%	269
SI*	21%	8%	42%	21%	8%	0%	0%	24
SK	34%	39%	3%	20%	0%	4%	0%	70
FI	54%	18%	10%	8%	4%	3%	3%	72
UK	36%	30%	24%	5%	1%	2%	2%	907
EU-19	36%	22%	20%	11%	7%	3%	2%	5.957

* data for 2007

Source: CARE Database / EC
Date of query: October 2010

Table 6: Proportion of fatalities at junctions per country, by mode of transport, 2008

	Car or Taxi	Pedestrian	Motor Cycle	Pedal Cycle	Moped	Lorry	Other	Total
BE	13%	22%	31%	37%	25%	11%	3%	18%
CZ	18%	21%	36%	30%		16%		22%
DK	19%	29%	53%	61%	40%	21%		31%
EE	32%	22%						29%
EL	7%	14%	13%	5%	7%	2%	0%	9%
ES	12%	22%	30%	31%	39%	12%	14%	19%
FR	7%	16%	14%	29%	20%	4%	18%	11%
IT	24%	21%	37%	47%	41%	16%	22%	29%
LV	7%	8%	0%	0%				7%
LU	25%							23%
HU	21%	26%	25%	38%	50%	13%	19%	25%
NL	21%	32%	37%	59%	51%	5%	44%	34%
PL	12%	17%	16%	23%	33%	11%	16%	15%
PT	10%	14%	30%	28%	28%	17%	6%	16%
RO	7%	9%	10%	15%	13%	8%	9%	9%
SI*	4%	7%	24%	29%	18%		0%	8%
SK	8%	13%	5%	32%		15%		12%
FI	19%	25%	20%	33%	23%	14%		21%
UK	25%	46%	44%	42%	52%	20%	40%	34%
EU-19	14%	20%	27%	33%	31%	11%	15%	19%

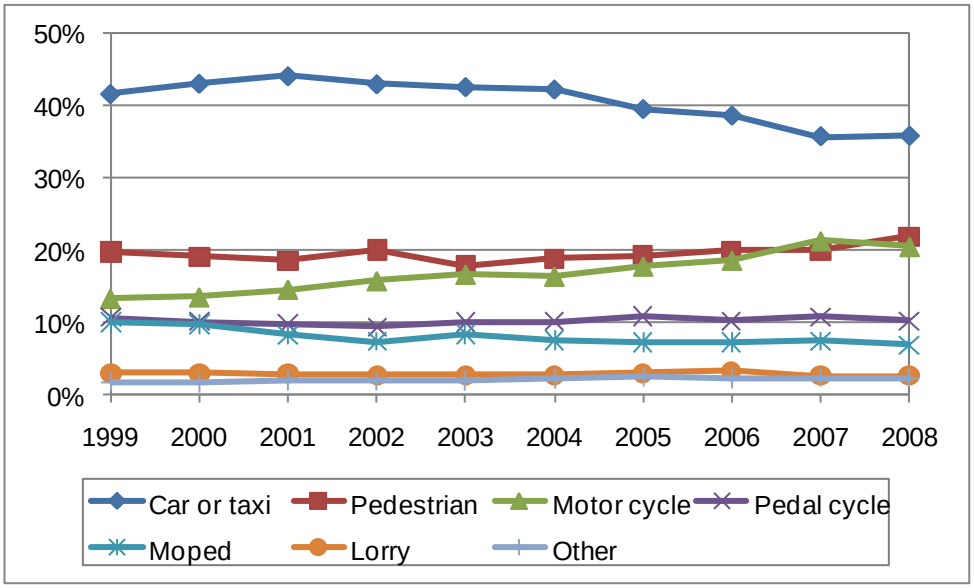
* data for 2007
Percentages only for cells with at least 10 fatalities

Source: CARE Database / EC
Date of query: October 2010

The proportion of fatalities occurring at junctions is highest for pedal cyclists and moped riders, and lowest for lorry occupants.

Of the 19 countries in these two tables, CARE data are not available throughout the period 1999-2008 for EE, HU, LV, SI and SK. To analyse trends consistently over this period, trends have been calculated for these EU-14 countries, and Figure 4 presents the trends that correspond to Table 5. The proportion of fatalities in junction accidents who were travelling by car or taxi fell from 2001, while the proportion who were walking or motorcycling rose.

Figure 4: Distribution of junction fatalities by mode of transport, EU-14



Source: CARE Database / EC
Date of query: October 2010

Age and Gender

Table 7 examines CARE data from the EU-19 countries in 2008 to see whether the incidence of fatalities in junction accidents varies with age and gender. It begins with the numbers of fatalities in junction and non-junction accidents. The distributions of junction and non-junction fatalities are then presented; for example, 27% of fatalities in junction accidents were female, compared 22% in non-junction accidents. Finally, the table presents the proportion of each group of fatalities that was killed at a junction.

The proportion of fatalities occurring at junctions is highest for 15-17 year old males and the elderly.

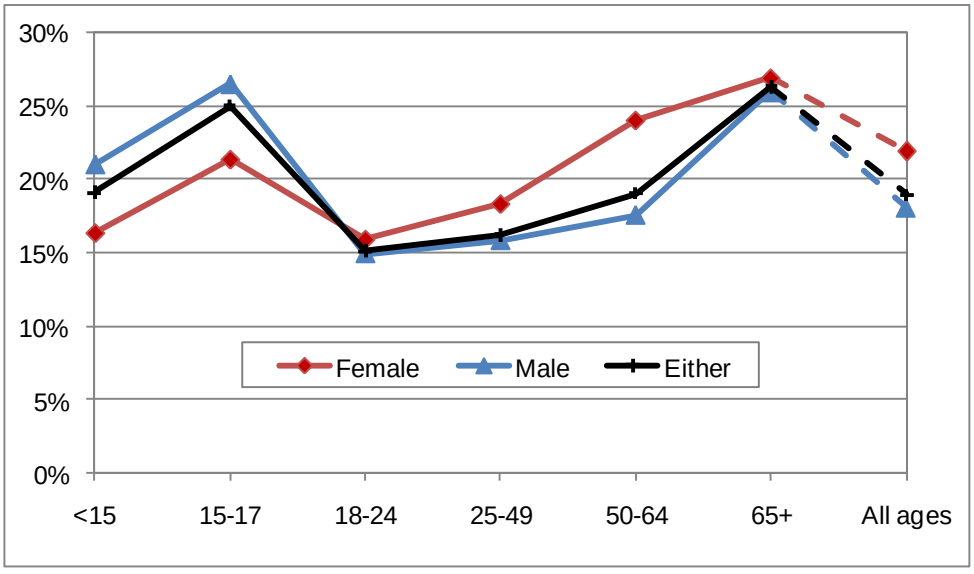
Table 7: Distribution of junction fatalities by age and gender, EU-19, 2008[3]

		<15	15-17	18-24	25-49	50-64	65+	not known	Total
Number of fatalities in:									
junction accidents	female	60	64	160	372	296	614	29	1.594
	male	113	192	639	1.635	729	990	56	4.355
non-junction accidents	female	305	235	845	1.657	934	1.666	56	5.697
	male	423	532	3.638	8.689	3.418	2.823	229	19.751
Distribution of fatalities in:									
junction accidents	female	1%	1%	3%	6%	5%	10%	0%	27%
	male	2%	3%	11%	27%	12%	17%	1%	73%
non-junction accidents	female	1%	1%	3%	7%	4%	7%	0%	22%
	male	2%	2%	14%	34%	13%	11%	1%	78%
Proportion of fatalities occurring at junctions	female	16%	21%	16%	18%	24%	27%	35%	22%
	male	21%	27%	15%	16%	18%	26%	20%	18%

Source: CARE Database / EC
Date of query: October 2010

Overall, the table shows that 15-17 year old males and the elderly (at least 65 years) are more likely than others to be killed at a junction. The variation of this proportion is illustrated in Figure 5.

Figure 5: The proportion of fatalities killed at a junction, by age and gender, EU-19, 2008[3]



Source: CARE Database / EC
Date of query: October 2010

[3] 2007 data for SI

Lighting and Weather conditions

Table 8 examines CARE data from the EU-19 countries in 2008 to see whether the incidence of fatalities in junction accidents varies with weather condition. The numbers of fatalities in junction and non-junction accidents are shown first, then the distributions of junction and non-junction fatalities are presented. Finally, the table presents the proportion of each group of fatalities that was killed at a junction, which was highest for dry conditions. The table shows that the proportion of fatalities occurring at junctions is rather higher in dry conditions than in adverse conditions such as snow.

Table 8: Distribution of junction fatalities by weather condition, EU-19, 2008[3]

	Dry	Rain	Fog or mist	Snow	Other	not known	Total
Number of fatalities in:							
junction accidents	5.005	596	59	31	229	60	5.981
non-junction accidents	20.938	2.858	397	237	823	235	25.487
Distribution of fatalities in:							
junction accidents	84%	10%	1%	1%	4%	1%	100%
non-junction accidents	82%	11%	2%	1%	3%	1%	100%
Proportion of fatalities occurring at junctions	19%	17%	13%	12%	22%	20%	19%

Source: CARE Database / EC
Date of query: October 2010

Table 9 repeats the analysis for lighting condition. This is poorly recorded for CZ, IT and SI so these are excluded, leaving the EU-16 countries. The proportion of fatalities occurring at junctions was highest for accidents in the dark with lighting, and lowest in the dark with no lighting. This probably reflects the tendency for street lighting to be installed at junctions.

Proportionately more fatalities occur in daylight or twilight at junctions than away from junctions.

Table 9: Distribution of junction fatalities by lighting condition, EU-16, 2008[3]

	Darkness, no lights	Darkness, with lights	Daylight or twilight	not known	Total
Number of fatalities in:					
junction accidents	408	1.067	2.817	30	4.323
non-junction accidents	5.250	3.234	12.266	282	21.032
Distribution of fatalities in:					
junction accidents	9%	25%	65%	1%	100%
non-junction accidents	25%	15%	58%	1%	100%
Proportion of fatalities occurring at junctions	7%	25%	19%	10%	17%

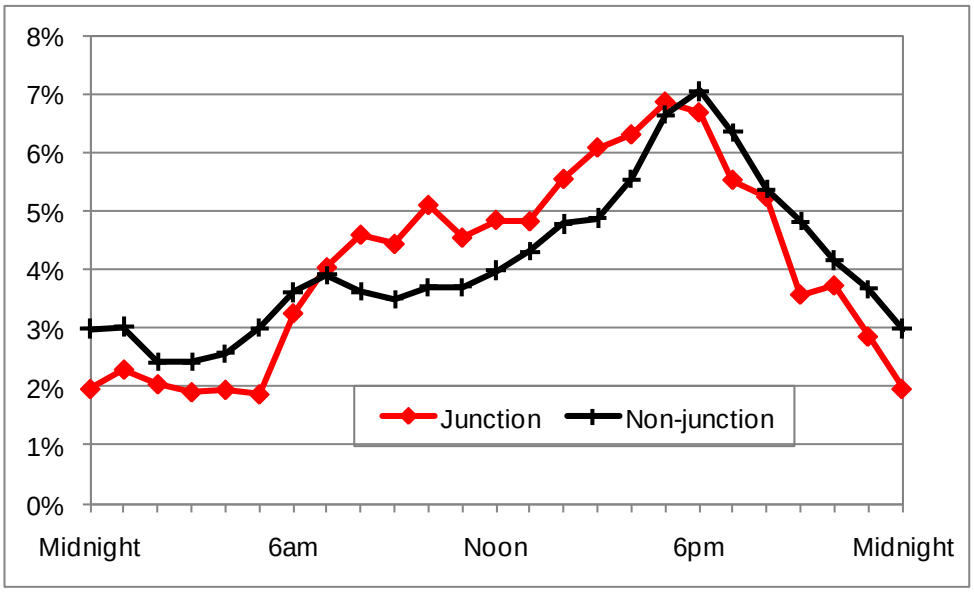
Source: CARE Database / EC
Date of query: October 2010

Day of week and time of day

Figure 6 shows the distribution of fatalities in junction accidents in 2008 by hour of day in the EU-19 countries, and compares this with the distribution of fatalities in accidents that occurred elsewhere (non-junction). By comparison with non-junction accidents, relatively few people died at junctions during the night (6pm-6am) and relatively many during the day (8am-5pm).

Proportionately more fatalities occur between 8am and 5pm at junctions than away from junctions, and proportionately fewer between 6pm and 6am.

Figure 6: Distribution of fatalities by hour, EU-19, 2008 [3]

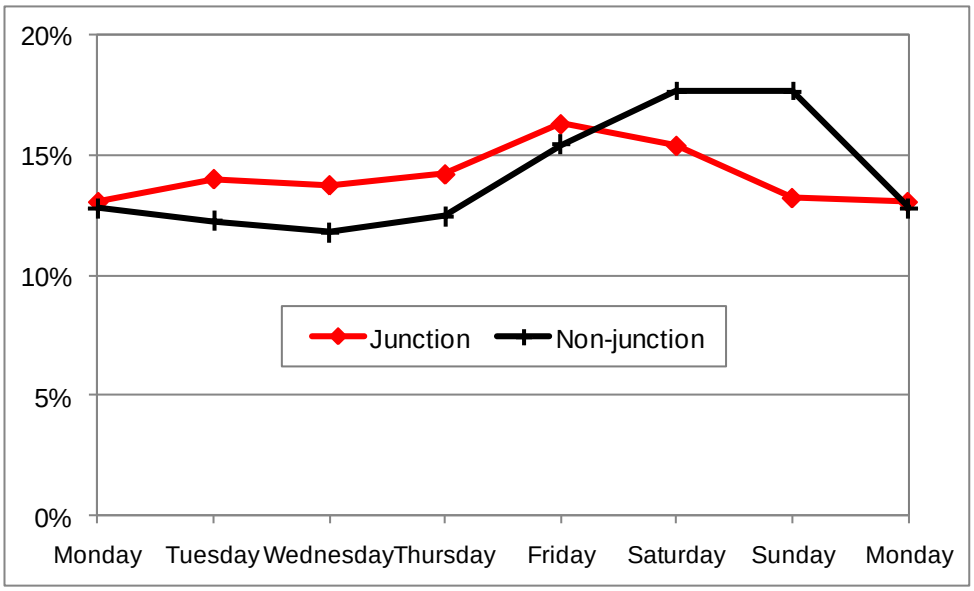


Source: CARE Database / EC
Date of query: October 2010

Figure 7 shows the distribution of fatalities in junction accidents in 2008 by day of week in the EU-19 countries, and compares this with the distribution of fatalities in non-junction accidents. The number of fatalities per day is less variable at junctions than away from junctions. By comparison with non-junction accidents, relatively few people died at junctions at weekends and relatively many on weekdays (Tuesday-Thursday).

Proportionately more fatalities occur between Tuesday and Thursday at junctions than away from junctions, and proportionately fewer on Saturday and Sunday.

Figure 7: Distribution of fatalities by day of week, EU-19, 2008 [3]

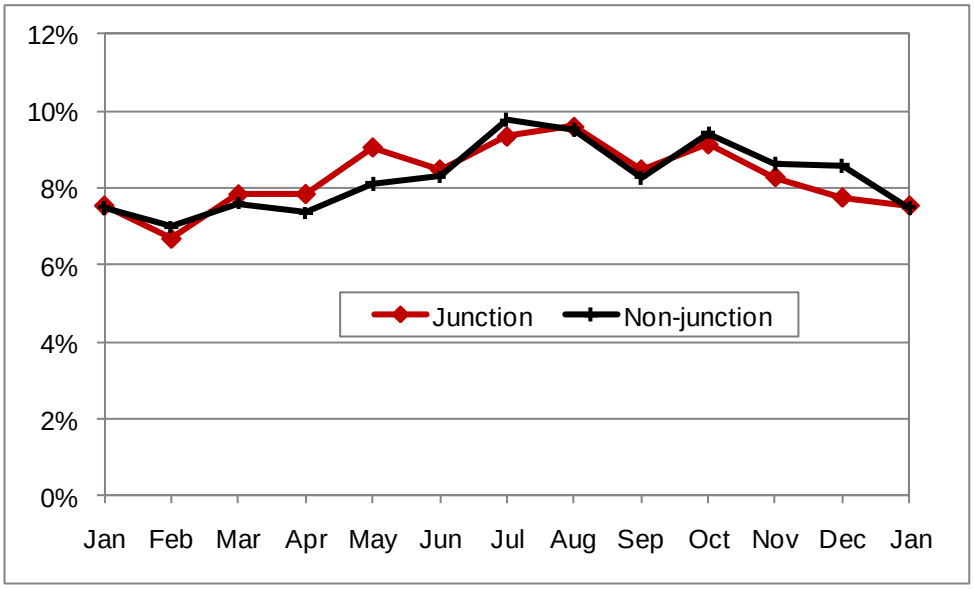


Source: CARE Database / EC
Date of query: October 2010

Seasonality

Figure 8 shows the distribution of fatalities in junction accidents in 2008 through the year in the EU-19 countries, and compares this with the distribution of fatalities in accidents that occurred elsewhere (non-junction). The two distributions are similar, but there were relatively many fatalities in junction accidents in April and May, and relatively few in November and December.

Figure 8: Distribution of fatalities by month in junction and non-junction accidents, EU-19, 2008 [3]



Proportionately more fatalities occur in April and May at junctions than away from junctions, and proportionately fewer November and December.

Accident Causation

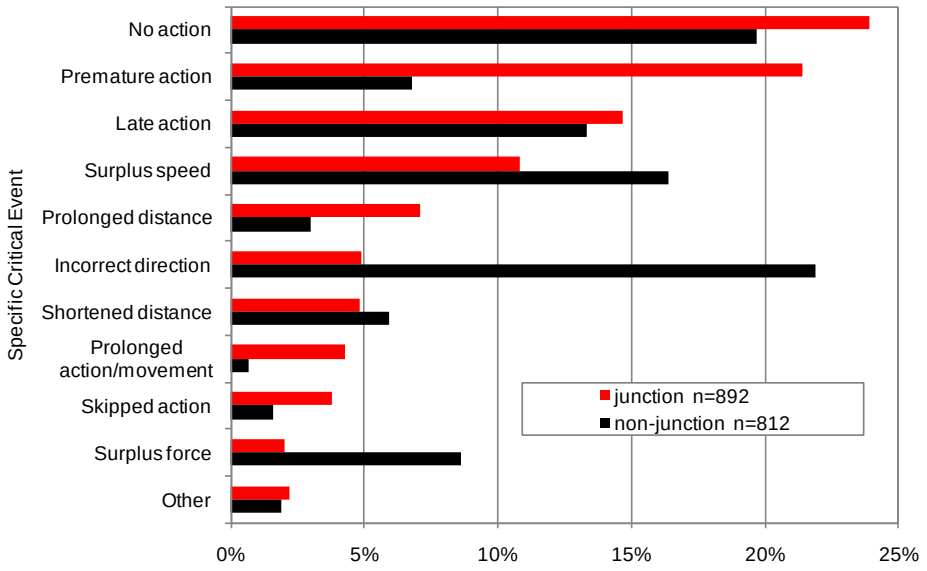
During the EC SafetyNet project, in-depth data were collected using a common methodology for samples of accidents that occurred in Germany, Italy, The Netherlands, Finland, Sweden and the UK[4] [5]. The SafetyNet Accident Causation Database was formed between 2005 and 2008, and contains details of 1.006 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.

48% (483) of accidents in the database occur at junctions. Figure 9 compares the distribution of specific critical events for drivers and riders in junction accidents to those in non-junction accidents.

[4] SafetyNet D5.5, Glossary of Data Variables for Fatal and Accident Causation Databases
[5] SafetyNet D5.8, In-Depth Accident Causation Database and Analysis Report

Specific critical events relating to 'timing' are recorded for 60% of drivers and riders in junction accidents in the sample.

Figure 9: Distribution of specific critical events - drivers or riders by junction presence



Source: SafetyNet Accident Causation Database 2005 to 2008 / EC
N=1704
Date of query: 2010

The distributions are quite different for the most often recorded specific critical events. The specific critical events under the general category of 'timing', no action, premature action and late action, are recorded more frequently in junction accidents, especially acting prematurely. A premature action is one undertaken before a signal has been given or the required conditions are established, for example entering a junction before it is clear of other traffic.

On the other hand, incorrect direction, surplus speed and surplus force are recorded more frequently in non-junction 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 driver is travelling at a speed unexpected by other road users. Similarly, surplus force describes excess acceleration or braking for conditions or actions. Incorrect direction refers to a manoeuvre being carried out in the wrong direction (for example, turning left instead of right) or leaving the road (not following the intended direction of the road). Here it is likely that the wrong direction element will appear in junction accidents and the leaving road element in non-junction accidents.

Table 10 shows the most frequent links recorded between causes for drivers and riders in junction accidents. There are 1.001 such links in total for this group

16% of the links between causes are observed to be between 'faulty diagnosis' and 'information failure'.

Table 10: Ten most frequent links between causes - drivers/riders, junction accidents

Links between causes	Frequency
Faulty diagnosis - Information failure (between driver and traffic environment or driver and vehicle)	158
Observation missed - Temporary obstruction to view	92
Observation missed - Permanent obstruction to view	76
Observation missed - Faulty diagnosis	73
Observation missed - Distraction	62
Observation missed - Inadequate plan	55
Faulty diagnosis - Communication failure	55
Inadequate plan - Insufficient knowledge	53
Observation missed - Inattention	44
Observation missed -	24
Others	309
Total	1.001

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

Observation missed is recorded most frequently and the causes leading to 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). Following observation missed, 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 driver/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).

Inadequate plan (a lack of all the required details or that the road user's ideas do not correspond to reality) is seen to lead to observation missed and be a result of insufficient knowledge.

Disclaimer

The information in this document is provided as it is and no guarantee or warranty is given that the information is fit for any particular purpose. Therefore, the reader uses the information at their own risk and liability.

For more information

Further statistical information about fatalities is available from the CARE database at the Directorate General for Mobility and Transport of the European Commission, 28 Rue de Mot, B -1040 Brussels.

Traffic Safety Basic Fact Sheets available from the European Commission concern:

- Main Figures
- Children (Aged <15)
- Youngsters (Aged 15-17)
- Young People (Aged 18-24)
- The Elderly (Aged >64)
- Pedestrians
- Cyclists
- Motorcycles and Mopeds
- Car occupants
- Heavy Goods Vehicles and Buses
- Motorways
- Junctions
- Urban areas
- Roads outside urban areas
- Seasonality
- Single vehicle accidents
- Gender

Country abbreviations used and definition of EU-level

EU - 18		EU-19= EU-18 +		EU-22 = EU-19 +	
BE	Belgium	SK	Slovakia	DE	Germany
CZ	Czech Republic			AT	Austria
DK	Denmark			SE	Sweden
EE	Estonia				
EL	Greece				
ES	Spain				
FR	France				
IT	Italy				
LV	Latvia				
LU	Luxembourg				
HU	Hungary				
NL	Netherlands				
PL	Poland				
PT	Portugal				
RO	Romania				
SI	Slovenia				
FI	Finland				
UK	United Kingdom (GB+NI)				

Detailed data on traffic accidents are published annually by the European Commission in the Annual Statistical Report. This includes a glossary of definitions on all variables used.

More information on the DaCoTA Project, co-financed by the European Commission, Directorate-General for Mobility and Transport is available at the DaCoTA Website: http://www.dacota-project.eu/index.html.

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