Traffic Safety Basic Facts 2011

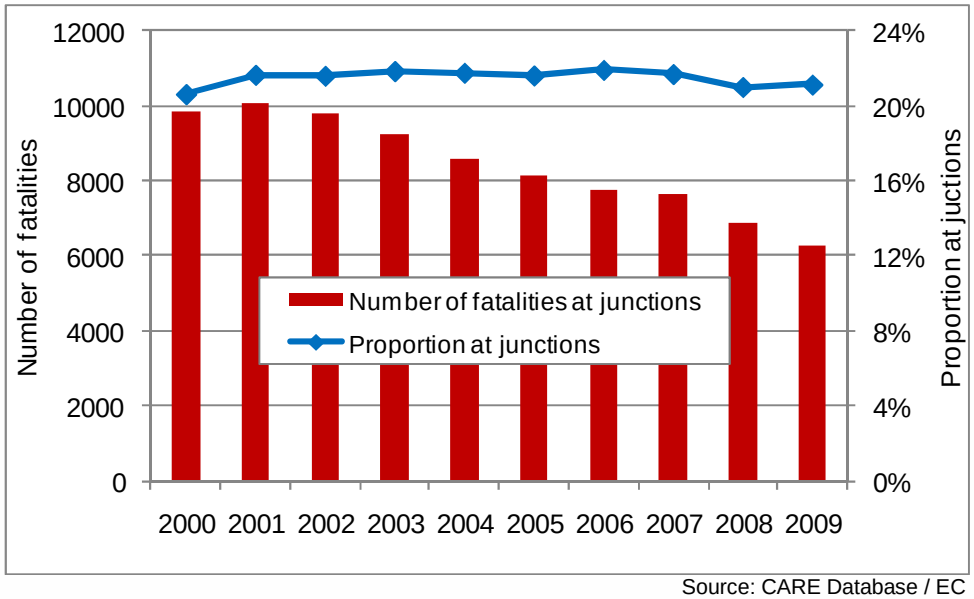
Junctions

It is estimated that about 7.200 people died in road traffic accidents at junctions in 2009 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 6.300 people were killed in road traffic accidents at junctions in 18[1] EU member states in 2009, a reduction of around a third since 2000. 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:November 2011

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 high proportions of unknown entries between 2000 and 2009: IE (82%), SE (46%), DE (39%) and AT (25%).

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 2009 for the 22 countries in Table 1 is 6.536, but it is estimated that when account is taken of “unknown” entries then the actual number is 7.198.

[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, 2000-2009 [1] [2]

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BE	334	357	315	272	221	210	207	195	167	164
CZ	283	241	289	303	327	267	222	218	238	177
DK	150	122	130	128	122	94	101	129	126	93
DE	1.739	1.643	1.577	1.578	1.359	1.293	1.249	1.153	1.073	1.031
EL	141	148	168	139	122	118	159	146	147	127
ES	914	856	805	806	764	750	754	721	577	484
FR	1.375	1.364	1.238	971	822	664	593	565	475	576
IT	1.528	2.013	2.000	1.837	1.761	1.674	1.654	1.550	1.369	1.218
LU	11	8	8	11	8	3	3	7	8	3
NL	401	327	321	324	247	249	276	253	227	221
AT	153	146	167	161	145	148	128	123	115	139
PL	-	934	934	983	1.014	898	768	840	834	699
PT	225	236	196	187	213	196	131	161	140	131
RO	59	71	94	64	61	236	238	272	269	255
SI	21	28	28	17	19	28	23	24	-	12
FI	85	104	93	83	65	73	65	62	72	51
SE	155	155	171	115	125	98	99	115	97	-
UK	1.318	1.325	1.287	1.289	1.189	1.152	1.115	1.089	907	816
EU-18	9.826	10.077	9.821	9.269	8.584	8.151	7.785	7.623	6.865	6.294
Yearly reduction		-3%	3%	6%	7%	5%	4%	2%	10%	8%
EE	-	-	-	-	-	33	38	54	38	21
LV	-	-	-	-	-	-	45	53	20	17
HU	-	-	-	316	280	260	266	268	246	169
SK	-	-	-	-	-	72	75	61	70	35

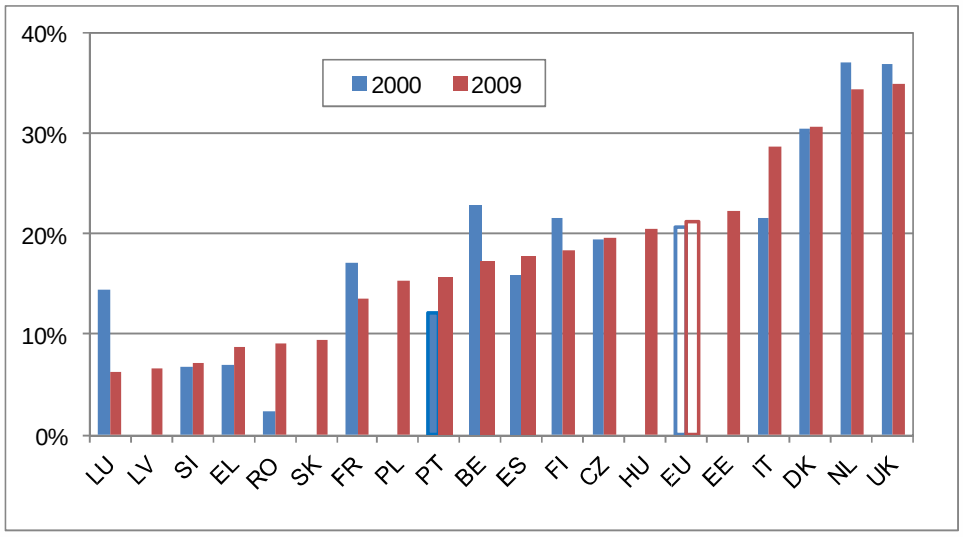
IE excluded as possible presence of a junction is unknown for over half of fatalities

Source: CARE Database / EC
Date of query: November 2011

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

Figure 2 shows the proportion of fatalities in junction accidents per country in 2000 and 2009. Ireland and Germany have been excluded as they had a high proportion of "unknown" entries in 2009. The proportions have all been calculated on the basis of known entries. The proportions from 2009 are illustrated in Map 1.

Figure 2: Proportion of fatalities in junction accidents per country, 2000 and 2009[1]



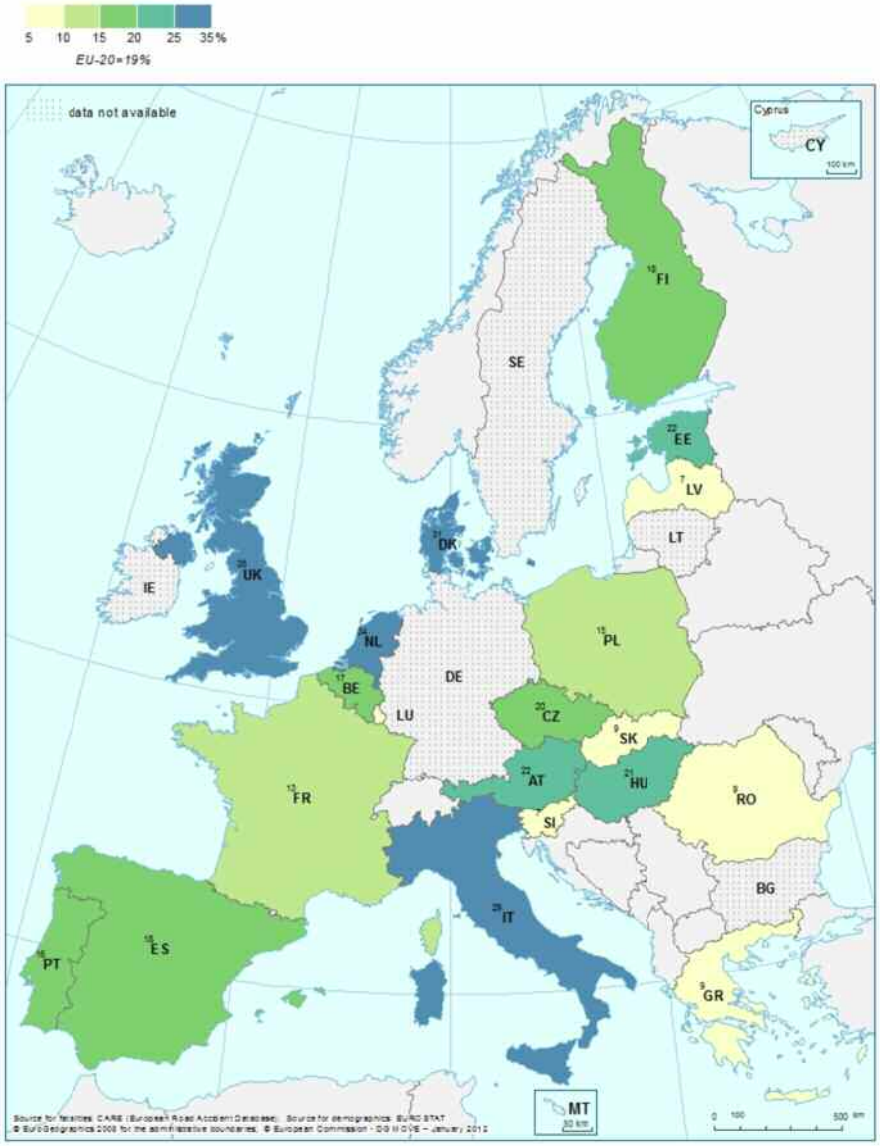
Source: CARE Database / EC
Date of query: November 2011

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

[2] The country abbreviations are shown on Page 15

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

Map 1 Proportion of fatalities in junction accidents per country, 2009



Type of Junction

Several types of junction are recorded in the CARE data, and Table 2 shows the data for 2009 (data for SE are for 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 2: Proportion of fatalities in junction accidents, by type of junction per country, 2009

	Accidents at junctions					Accidents not at junctions	Not known	Total (100%)
	Cross-road	T or Y Junction	Round-about	Level Crossing	Other/ Unknown			
BE	0%	0%	0%	0%	17%	83%	0%	944
CZ	9%	8%	0%	3%	0%	80%	0%	901
DK	11%	0%	1%	1%	18%	69%	0%	303
DE	22%	0%	0%	1%	3%	36%	38%	4.152
EE	6%	7%	2%	4%	2%	74%	4%	98
EL	0%	0%	0%	0%	0%	91%	9%	1.456
ES	7%	6%	2%	0%	2%	82%	0%	2.714
FR	6%	4%	1%	1%	2%	87%	0%	4.273
IT	13%	0%	2%	0%	13%	71%	0%	4.237
LV	0%	0%	0%	0%	7%	93%	0%	254
LU	4%	2%	0%	0%	6%	85%	2%	48
HU	17%	0%	0%	3%	1%	79%	0%	822
NL	31%	0%	2%	2%	0%	66%	0%	644
AT	15%	5%	0%	2%	0%	78%	0%	633
PL	15%	0%	0%	1%	0%	84%	0%	4.572
PT	6%	8%	1%	1%	1%	82%	1%	840
RO	8%	0%	0%	1%	0%	91%	0%	2.796
SI	5%	0%	0%	2%	0%	92%	1%	171
SK	4%	5%	0%	0%	0%	88%	3%	384
FI	0%	0%	0%	0%	18%	82%	0%	279
SE*	21%	0%	0%	0%	3%	1%	74%	397
UK	11%	16%	3%	0%	5%	65%	0%	2.866
EU-22	11%	3%	1%	1%	4%	74%	6%	33.784

* data for 2008
IE excluded as possible presence of a junction is unknown for over half of fatalities

Source: CARE Database / EC
Date of query: November 2011

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 3 shows the number of fatalities on each road type per country, together with the proportion of fatalities occurring at junctions. The seventeen countries are those for which the reporting of junction accidents and road type was relatively good in 2009.

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

Table 3: Distribution of fatalities at junctions per country by road type, 2009

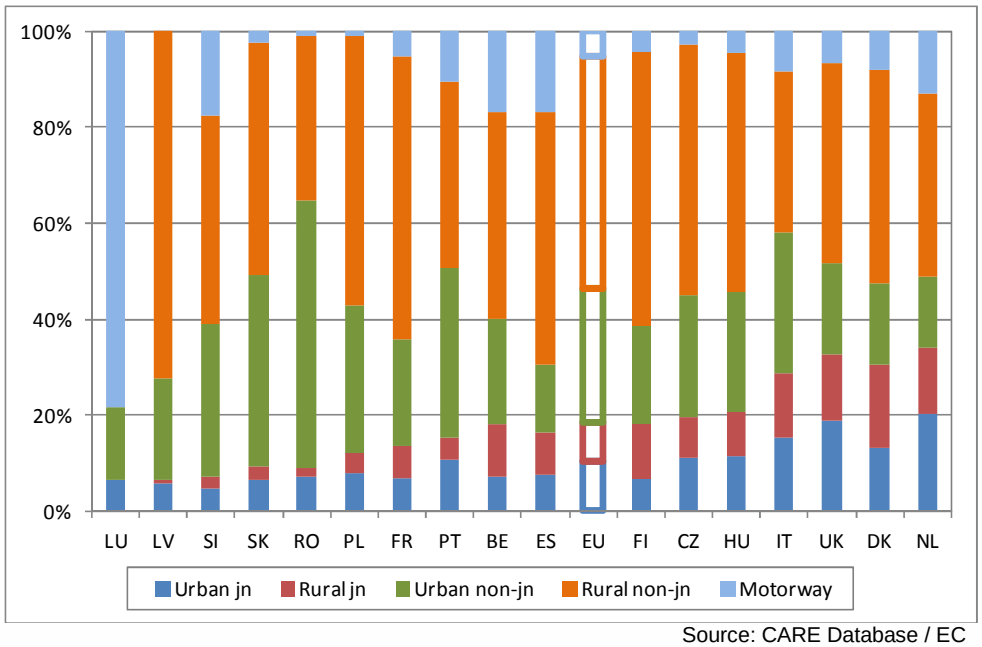
	Motorway		Non-motorway				All roads	
	Fatalities	% at junction	Rural Fatalities	% at junction	Urban Fatalities	% at junction	Fatalities	% at junction
BE	150	2%	483	20%	257	25%	944	17%
CZ	25	0%	547	14%	329	30%	901	20%
DK	24	4%	187	28%	92	43%	303	31%
ES	460	8%	1.670	14%	584	35%	2714	18%
FR	225	1%	2.788	10%	1.252	23%	4273	13%
IT	350	0%	1.995	28%	1.892	35%	4237	29%
LV	0		186	1%	68	22%	254	7%
LU	36	0%	0		10	30%	48	6%
HU	38	0%	483	15%	301	32%	822	21%
NL	83	2%	327	26%	222	58%	644	34%
PL	43	0%	2.228	7%	1.412	21%	4572	10%
PT	89	1%	365	11%	386	23%	840	16%
RO	25	0%	1.015	5%	1.756	12%	2796	9%
SI	30	0%	77	5%	64	13%	171	7%
SK	9		197	6%	176	14%	384	9%
FI	12	0%	191	17%	76	25%	279	18%
UK	132	10%	1.130	25%	762	50%	2337	29%
EU-17	1.731	3%	13.869	15%	9.640	27%	26.519	18%

Percentages only for cells with at least 10 fatalities

Source: CARE Database / EC
Date of query: November 2011

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, 2009



Source: CARE Database / EC
Date of query: November 2011

Mode of Transport

Table 4 shows, of the fatalities recorded in CARE data as occurring at junctions, the distribution of fatalities by mode of transport. Table 5 then shows, of the fatalities recorded for each mode of transport the proportion that occurred at junctions. For example, 17 pedestrians were killed in Belgium at junctions, 10% of the 164 fatalities at junctions. 101 pedestrians were killed in total, so this represents 17% of pedestrian fatalities.

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

Table 4: Distribution of junction fatalities per country by mode of transport, 2009

	Car or Taxi	Pedestrian	Motor Cycle	Pedal Cycle	Moped	Lorry	Other	Total (=100%)
BE	37%	10%	17%	25%	5%	4%	2%	164
CZ	43%	21%	14%	14%	2%	4%	2%	177
DK	42%	17%	14%	13%	9%	4%	1%	93
EE	48%	38%	5%	0%	5%	5%	0%	21
EL	44%	14%	39%	0%	0%	2%	0%	127
ES	29%	23%	24%	4%	12%	5%	3%	484
FR	35%	13%	30%	7%	11%	2%	1%	576
IT	37%	12%	29%	10%	7%	1%	3%	1.218
LV	29%	29%	12%	24%	0%	0%	6%	17
LU	0%	67%	0%	33%	0%	0%	0%	3
HU	34%	21%	8%	27%	5%	4%	1%	169
NL	23%	14%	10%	39%	10%	1%	4%	221
PL	35%	35%	10%	13%	3%	3%	1%	699
PT	25%	17%	28%	6%	12%	7%	5%	131
RO	29%	32%	5%	11%	6%	4%	13%	255
SI	25%	33%	8%	0%	0%	8%	25%	12
SK	23%	37%	14%	11%	0%	11%	3%	35
FI	45%	12%	14%	22%	2%	6%	0%	51
UK	33%	32%	24%	7%	1%	1%	2%	816
EU-19	34%	21%	21%	11%	6%	2%	3%	5.269

Source: CARE Database / EC
Date of query: November 2011

Table 5: Proportion of fatalities at junctions per country, by mode of transport, 2009

	Car or Taxi	Pedestrian	Motor Cycle	Pedal Cycle	Moped	Lorry	Other	Total
BE	13%	17%	20%	46%	36%	10%	5%	17%
CZ	15%	21%	29%	30%		16%		20%
DK	24%	31%	48%	48%	53%	21%		31%
EE	19%	38%						22%
EL	8%	9%	12%	0%	0%	4%	0%	9%
ES	11%	24%	26%	34%	36%	10%	17%	18%
FR	9%	15%	19%	26%	22%	5%	17%	13%
IT	25%	22%	35%	42%	41%	18%	25%	29%
LV	4%	6%		15%			9%	7%
LU	0%	17%						6%
HU	15%	19%	19%	45%	35%	15%	18%	21%
NL	17%	48%	31%	63%	49%	7%	67%	34%
PL	11%	17%	24%	24%	32%	15%	16%	15%
PT	11%	15%	32%	28%	27%	9%	7%	16%
RO	6%	8%	19%	18%	12%	9%	20%	9%
SI	5%	18%	4%	0%			9%	7%
SK	4%	12%	16%	21%		27%	7%	9%
FI	14%	20%	26%	55%	9%	19%		18%
UK	24%	49%	41%	54%	63%	13%	44%	35%
EU-19	14%	19%	27%	35%	30%	10%	18%	19%

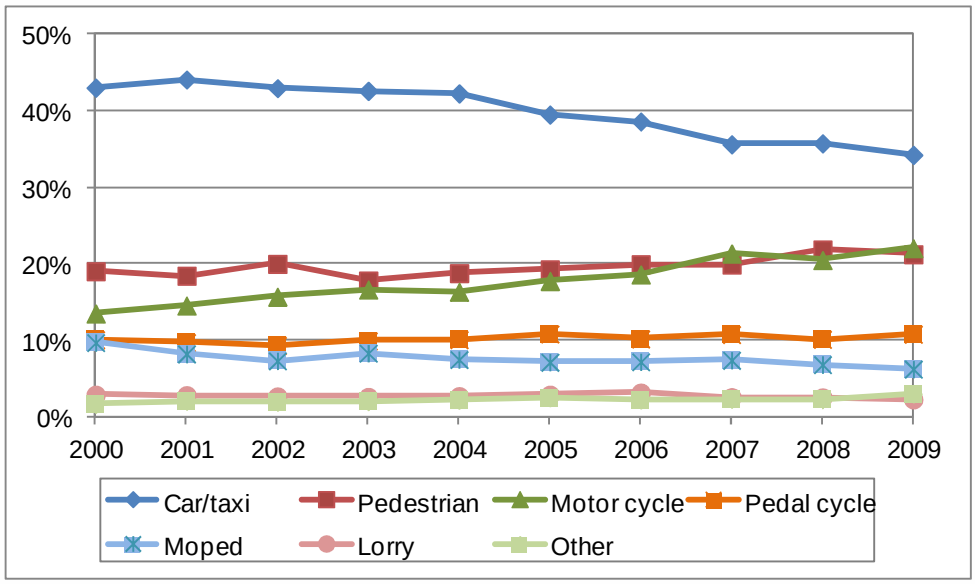
Percentages only for cells with at least 10 fatalities

Source: CARE Database / EC
Date of query: November 2011

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 2000-2009 for EE, HU, LV and SK. To analyse trends consistently over this period, trends have been calculated for these EU-15 countries, and Figure 4 presents the trends that correspond to Table 4. 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-15



Source: CARE Database / EC
Date of query: November 2011

Age and Gender

Table 6 examines CARE data from the EU-19 countries in 2009 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, 26% of fatalities in junction accidents were female, compared with 23% 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 the elderly.

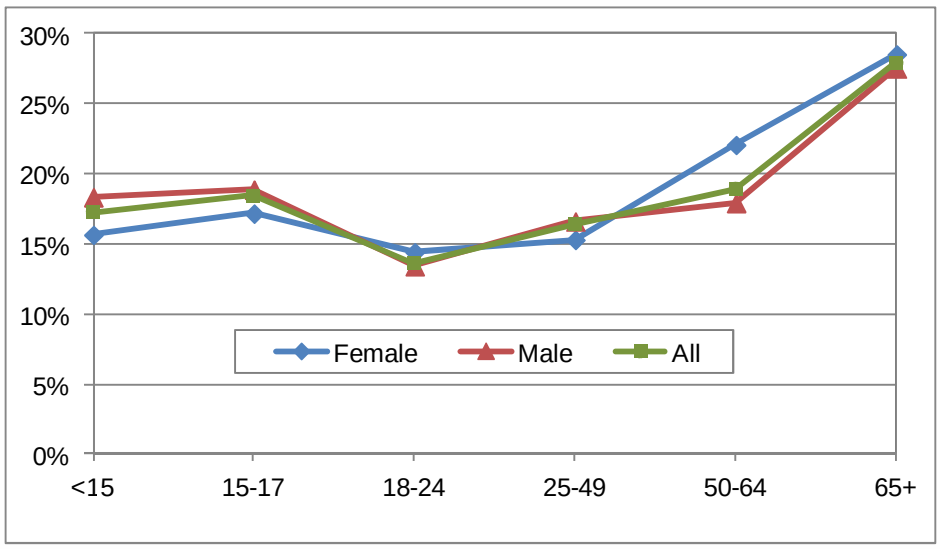
Table 6: Distribution of junction fatalities by age and gender, EU-19, 2009

		<15	15-17	18-24	25-49	50-64	65+	not known	Total
Number of fatalities in:									
junction accidents	female	47	40	124	285	252	605	25	1.378
	male	81	120	507	1.502	657	980	31	3.879
non-junction accidents	female	251	192	734	1.576	891	1.514	82	5.240
	male	360	516	3.266	7.533	3.007	2.579	204	17.466
Distribution of fatalities in:									
junction accidents	female	1%	1%	2%	5%	5%	12%	0%	26%
	male	2%	2%	10%	29%	13%	19%	1%	74%
non-junction accidents	female	1%	1%	3%	7%	4%	7%	0%	23%
	male	2%	2%	14%	33%	13%	11%	1%	77%
Proportion of fatalities occurring at junctions	female	16%	17%	14%	15%	22%	29%	23%	21%
	male	18%	19%	13%	17%	18%	28%	13%	18%

Source: CARE Database / EC
Date of query: November 2011

Overall, the table shows that 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, 2009



Source: CARE Database / EC
Date of query: November 2011

Lighting and Weather conditions

Table 7 examines CARE data from the EU-19 countries in 2009 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, followed by the distributions of junction and non-junction fatalities. The table also presents for each weather condition, the proportion of fatalities that were killed at a junction. This was highest for dry conditions (20%) and lowest in adverse conditions such as snow (10%).

Table 7: Distribution of junction fatalities by weather condition, EU-19, 2009

	Dry	Rain	Fog or mist	Snow	Other	not known	Total
Number of fatalities in:							
junction accidents	4.535	459	45	43	176	10	5.269
non-junction accidents	18.629	2.584	301	411	731	130	22.787
Distribution of fatalities in:							
junction accidents	86%	9%	1%	1%	3%	0%	100%
non-junction accidents	82%	11%	1%	2%	3%	1%	100%
Proportion of fatalities occurring at junctions	20%	15%	13%	10%	19%	7%	19%

Source: CARE Database / EC
Date of query: November 2011

Table 8 repeats the analysis for lighting condition. This is poorly recorded for IT and SI so these are excluded, leaving the EU-17 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 8: Distribution of junction fatalities by lighting condition, EU-17, 2009

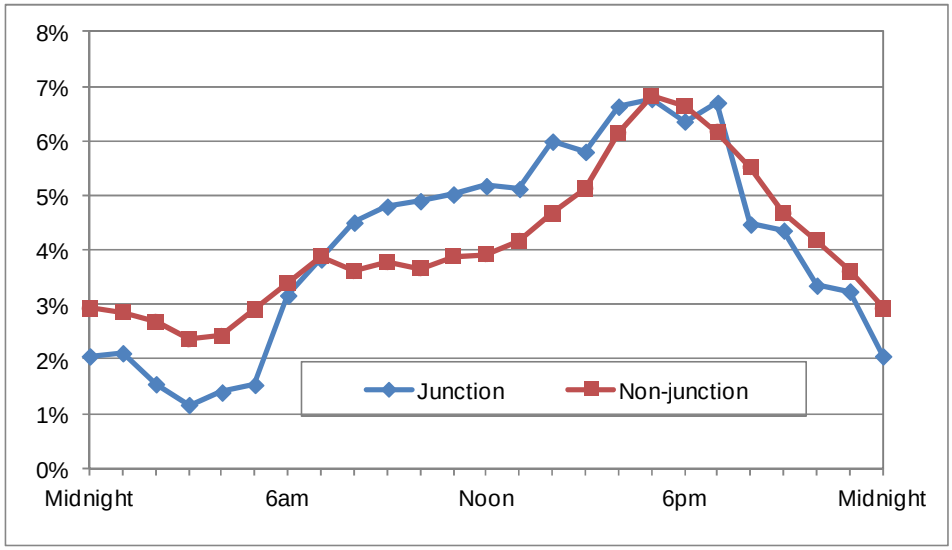
	Darkness. no lights	Darkness. with lights	Daylight or twilight	not known	Total
Number of fatalities in:					
junction accidents	296	915	2.767	61	4.039
non-junction accidents	4.352	2.978	11.722	558	19.611
Distribution of fatalities in:					
junction accidents	7%	23%	69%	2%	100%
non-junction accidents	22%	15%	60%	3%	100%
Proportion of fatalities occurring at junctions	6%	24%	19%	10%	17%

Source: CARE Database / EC
Date of query: November 2011

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 non-junction accidents. This comparison shows that proportionately fewer people died at junctions during the night (8pm-6am) and proportionately more during the day (8am-5pm).

Figure 6: Distribution of fatalities by hour, EU-19, 2009

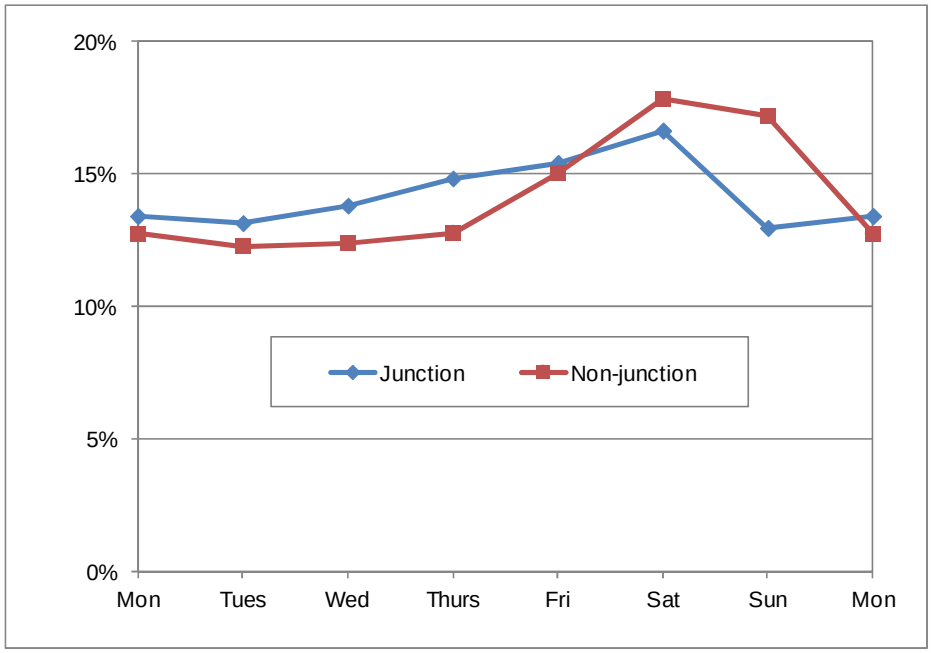


Source: CARE Database / EC
Date of query: November 2011

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

Figure 7 shows the distribution of fatalities in junction accidents in 2009 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 (Monday -Thursday).

Figure 7: Distribution of fatalities by day of week, EU-19, 2009



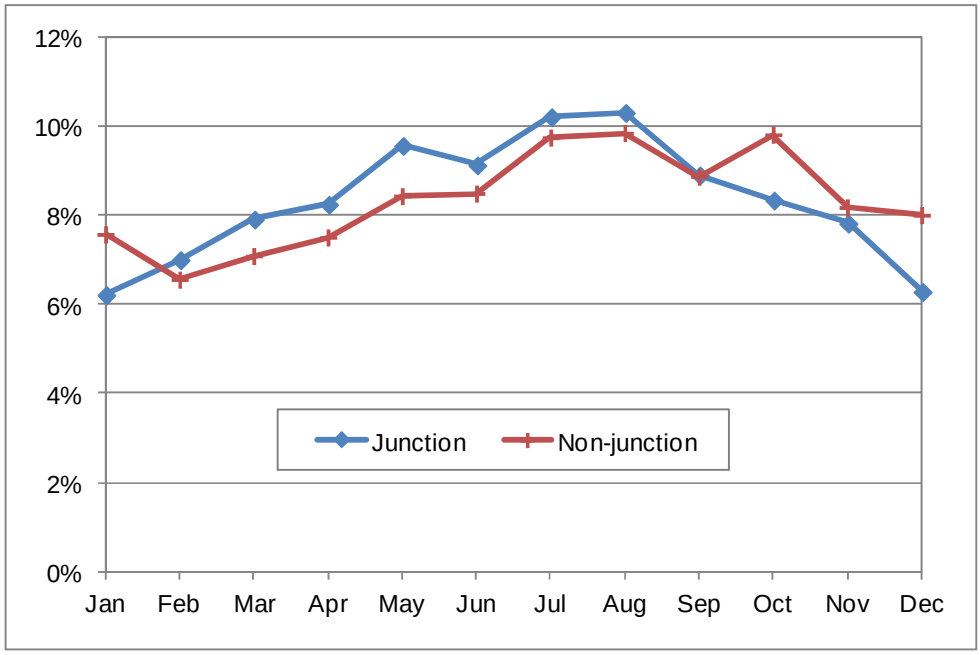
Source: CARE Database / EC
Date of query: November 2011

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

Seasonality

Figure 8 shows the distribution of fatalities in junction accidents in 2009 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 Feb to Aug and relatively few in Oct to Jan.

Figure 8: Distribution of fatalities by month in junction and non-junction accidents, EU-19, 2009



Proportionately more fatalities occur in Feb to August at junctions than away from junctions, and proportionately fewer October to January.

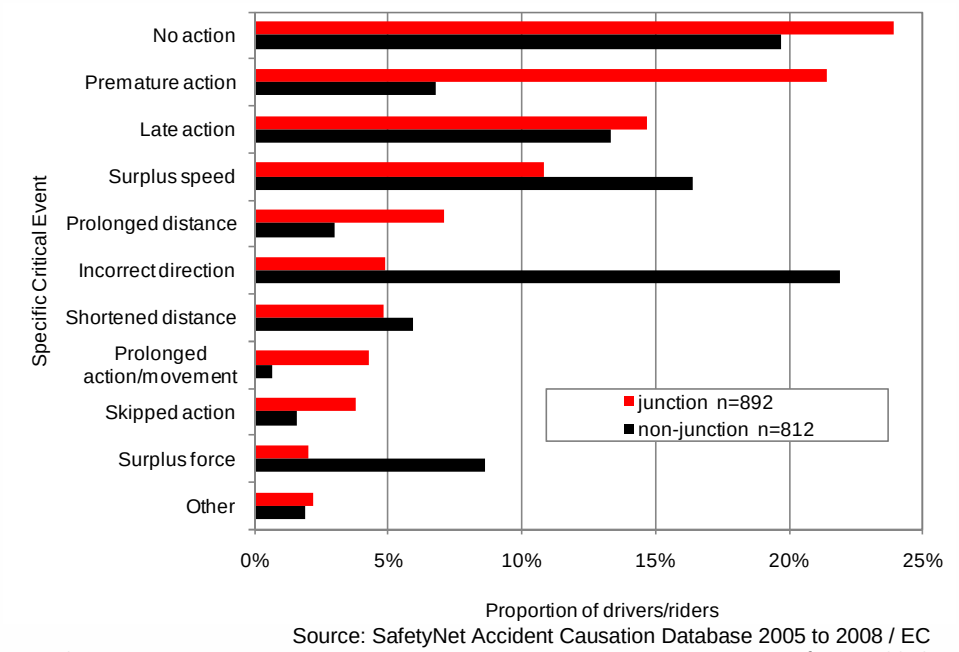
Accident Causation

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[3] [4]. 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.

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

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

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

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 9 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 9: 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 - 19	
BE	Belgium
CZ	Czech Republic
DK	Denmark
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
SK	Slovakia
FI	Finland
UK	United Kingdom (GB+NI)

EU-22= EU-19 +	
DE	Germany
AT	Austria
SE	Sweden

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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