Traffic Safety Basic Facts 2011

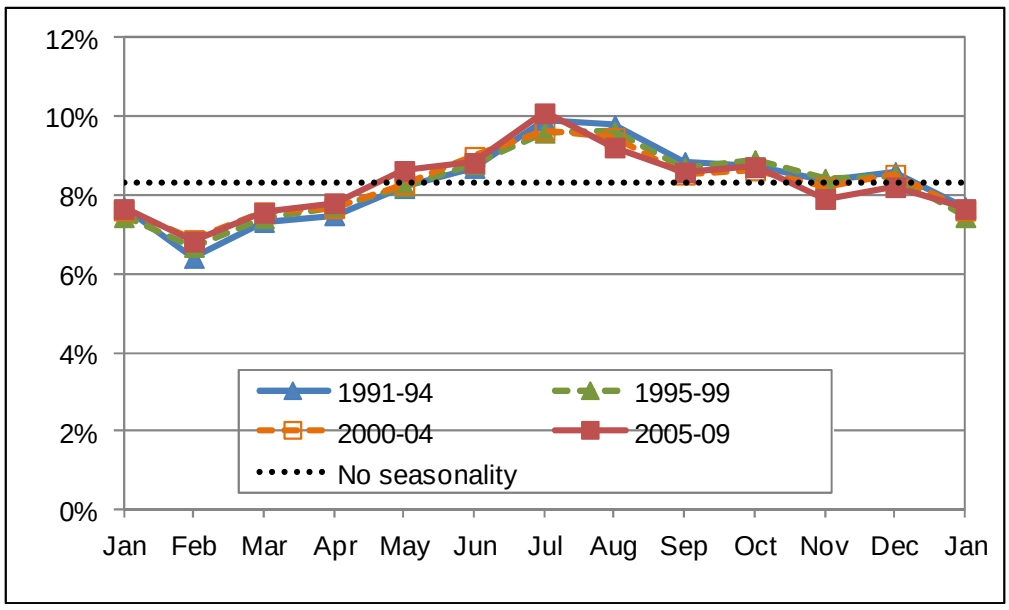
Seasonality

This Basic Fact Sheet examines the extent to which the number of people killed in road accidents varies by month across the EU. Most other Basic Fact Sheets focus on particular groups of accidents or casualties; this one examines general patterns in the CARE data so its approach is slightly different. Most analyses are of grouped data from 2005-09, to minimise the effects of chance.

First, however, Figure 1 shows that the distribution of fatalities by month has varied very little over the period covered by the CARE data, with the fewest fatalities in February and the most in July. The only clear change, in fact, has been for the peak in July to become slightly more pronounced. To achieve consistency between the four periods, the analysis has been restricted to those countries with data for each year between 1991 and 2009[1], as defined in Table 1 (the 15 states that were members of the EU in 1995 without Germany). Note that if there were no seasonality then 8.3% of fatalities would occur each month, as shown by the line "No seasonality", so there were relatively few fatalities per month from January to April and relatively many from June to October.

Although the annual number of people who died in road traffic accidents in Europe has fallen over many years, the distribution of the annual number by month has scarcely changed.

Figure 1 : The proportion of fatalities in the EU-14 by month, 1991-2009[2]



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

The remaining analyses are of grouped data from 2005-09[2].

[1] 2008 data for IE and SE
[2] 2008 data is used as a proxy for 2009 data for IE and SE

Table 1 : Average number of fatalities per year, 2005-09[2]

EU-14			EU-24=EU14+		
Belgium	BE	1.023	Czech Republic	CZ	1.109
Denmark	DK	350	Germany	DE	4.806
Ireland	IE	333	Estonia	EE	160
Greece	EL	1.587	Latvia	LV	279
Spain	ES	3.636	Hungary	HU	1.126
France	FR	4.639	Malta	MT	13
Italy	IT	5.116	Poland	PL	5.256
Luxembourg	LU	44	Romania	RO	2.775
Netherlands	NL	702	Slovenia	SI	240
Austria	AT	700	Slovakia	SK	574
Portugal	PT	983			
Finland	FI	344			
Sweden	SE	430			
United Kingdom	UK	2.935			

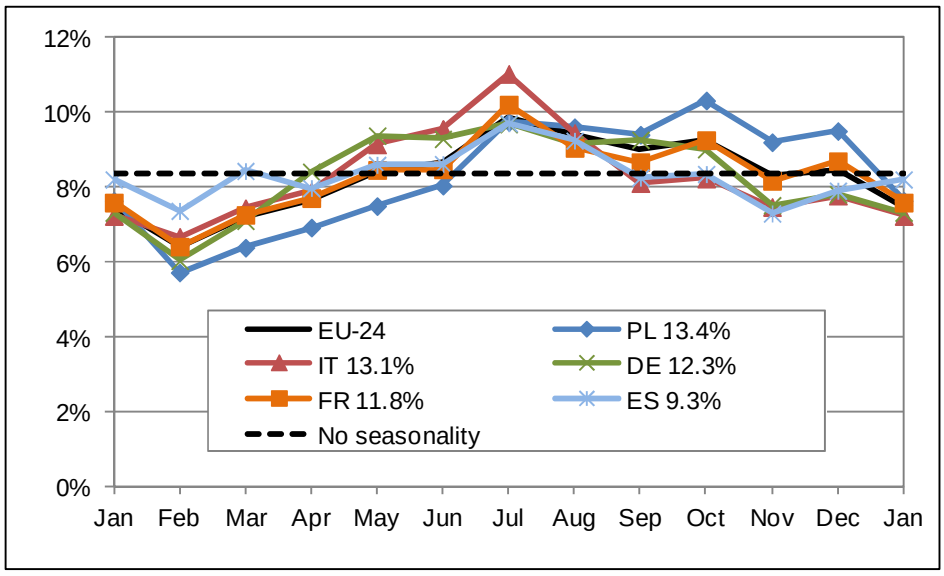
2008 data are used as a proxy for 2009 data for IE and SE

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

In order to see whether seasonality varies by country, Figure 2 compares the distribution for the EU-24 in 2005-2009 with the distributions for the five member states with the greatest fatality totals in this five year period.

There are clear differences, with the distribution for France being very similar to the EU-24 distribution, whereas the July peak in Italy is especially pronounced. The overall proportion of EU fatalities in each of the five member states is also shown in the legend; together they accounted for nearly 60% of fatalities in these five years.

Figure 2: The proportion of fatalities by month in the EU-24 and 5 Member States, 2005-2009



2008 data are used as a proxy for 2009 data for IE and SE

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

The distribution of fatalities by month varies considerably from country to country.

A simple index of seasonality for each country is obtained by dividing the standard deviation of the twelve monthly fatality averages by their mean. Map 1 presents the national indices for each country. It shows that seasonality is below average in several Western European countries, and above average in several Central European countries.

Map 1: The seasonality index 2005-2009

The distribution of fatalities by month tends to vary most in Central Europe and least in Western Europe.

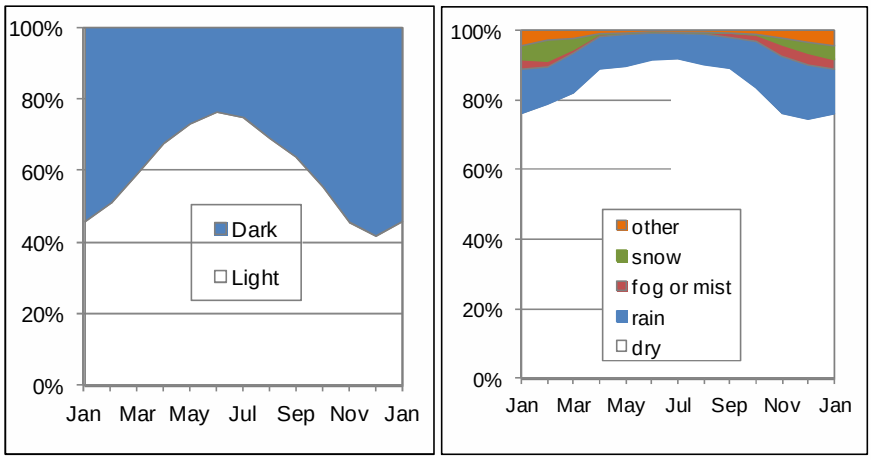
The seasonality of fatality distributions is likely to be the result of many factors. The principal factor is probably the changing pattern of travel during the year with, for example, many more trips being made for leisure and recreation during the summer than the winter. Accident risk also varies seasonally with changing weather conditions and hours of daylight. The relative harshness of winters in Northern and Central Europe is likely to contribute to the greater seasonality shown in Map 1 for several of these countries.

Weather and hours of daylight

Variations through the year in weather and the hours of daylight are likely to contribute to the seasonality that has been seen, and these also vary across Europe. In the EU-19[3] states over the whole year, 61% of fatalities occurred in daylight (includes twilight), but the percentage was below 46% between November and February. The great majority (85%) occurred in dry conditions, and this was still at 75% in December.

The proportion of fatalities occurring in daylight varies seasonally, which probably affects the seasonality of the fatality distribution.

Figure 3 : Monthly proportion of fatalities by light and weather condition, EU-19[3], 2005-2009

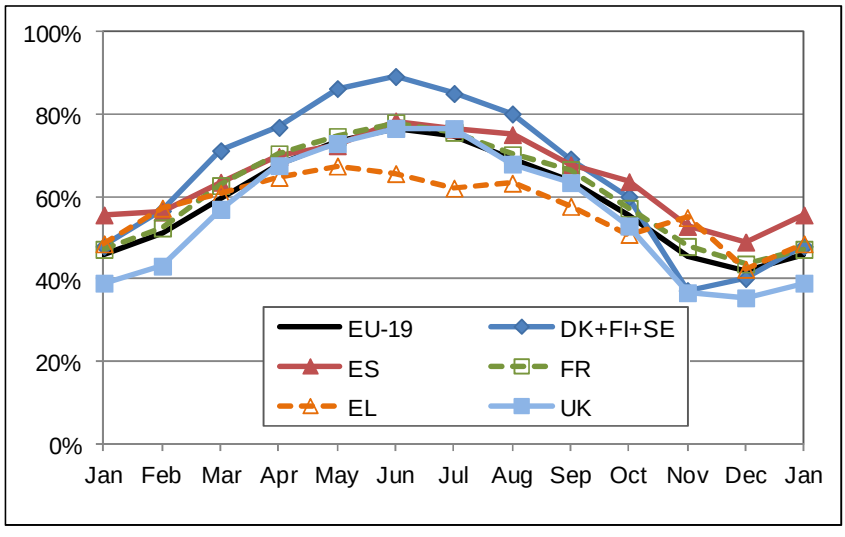


2008 data are used as a proxy for 2009 data for IE and SE

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

The geographic variation of the proportion of fatalities occurring in daylight is examined in Figure 4, choosing countries from across Europe and combining the three Scandinavian countries (DK, FI, SE). The variation is greatest in the three Scandinavian countries and least in Greece, but differences cannot be explained simply by day length. This is depends on latitude but, for example, there are fewer fatalities in daylight in the UK than in the Scandinavian countries during the winter despite the UK's greater day length in winter that results from its more southerly location.

Figure 4 : Monthly proportion of fatalities in daylight, by country, 2005-2009



2008 data are used as a proxy for 2009 data for IE and SE

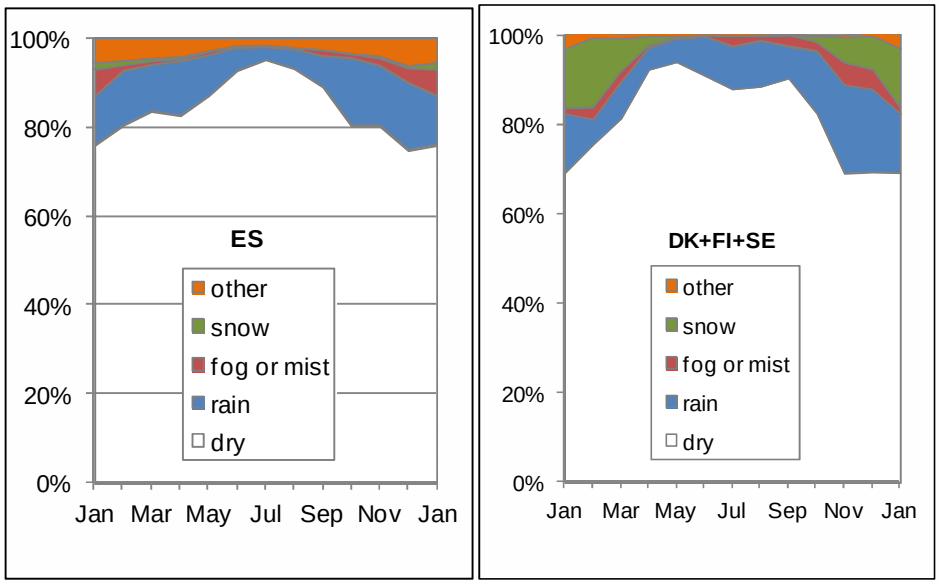
Source: CARE database / EC
Date of query: November 2011

[3] EU-24 except CZ, DE, IT, SI and MT which are excluded because lighting is unknown for many fatalities.

More detailed analysis of geographic variation in the CARE data requires a different form of presentation. This is illustrated in the case of weather condition by Figure 5, which compares the distributions in Spain and the three Scandinavian countries. Spain is selected to represent the South of Europe, the Scandinavian countries to represent the North (a different selection might yield results that differed slightly in detail).The proportion of fatalities in dry conditions is only slightly greater in Spain (85% compared with 83%), but the proportion in snow is predictably much lower.

The distribution of weather conditions at the time of fatal accidents varies considerably between countries.

Figure 5 : Monthly proportion of fatalities by weather and country, 2005-2009



2008 data are used as a proxy for 2009 data for SE

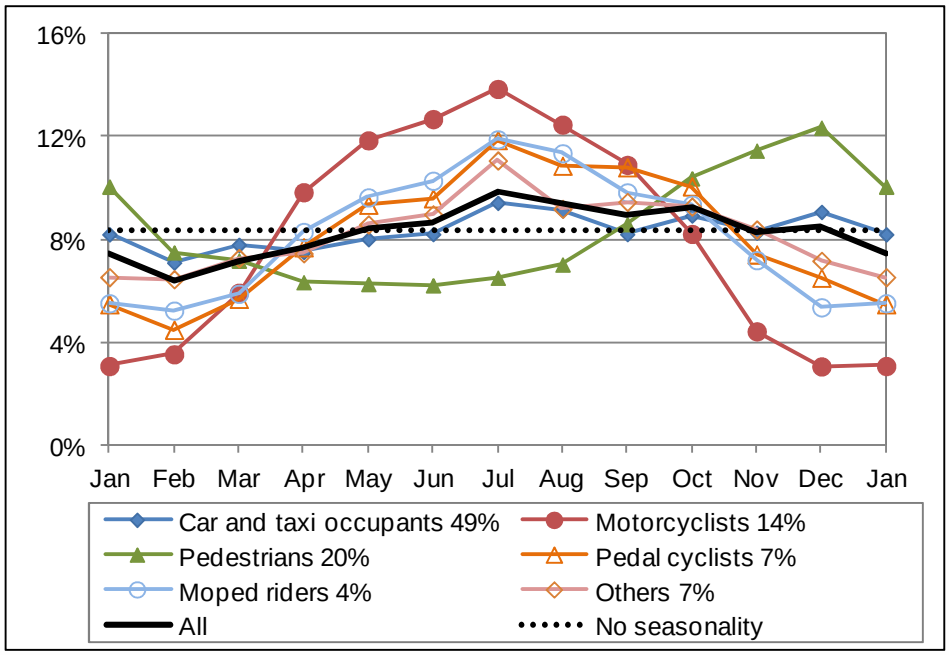
Source: CARE database / EC
Date of query: November 2011

Mode of Transport

An important way of grouping casualties is by their mode of transport. Figure 6 shows that the seasonality for several groups differs clearly from the overall pattern. Relatively many motorcyclists are killed in the summer, and relatively few in the winter, while deviations from the overall pattern are similar but less for moped riders and pedal cyclists. These variations are probably the result of the preference by riders of two-wheeled vehicles to travel when the weather is better. The reason for the increase in pedestrian fatalities from 6,3% of the annual total in June to 12,4% in December is probably more complex. In Figure 6, the group 'others' consists mainly of occupants of goods vehicles, buses and coaches.

Motorcycling is the mode of transport with the most seasonal fatality distribution.

Figure 6 : Monthly proportion of fatalities by mode of transport, EU-24[4], 2005-2009

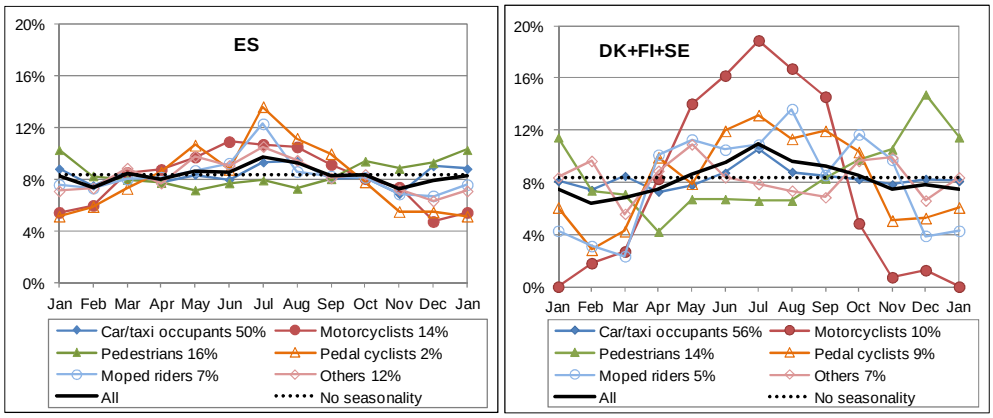


2008 data are used as a proxy for 2009 data for IE and SE

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

The geographic range of the seasonality of fatalities by mode of transport is illustrated in Figure 7, which compares the distributions in Spain and the three Scandinavian countries. The Spanish fatality proportions show limited variation by month, except for the minor mode of pedal cycling. By contrast, the Scandinavian proportions vary considerably by month, especially for pedestrians and motorcyclists.

Figure 7 : Monthly proportion of fatalities by mode of transport and country, 2005-2009



2008 data are used as a proxy for 2009 data for SE

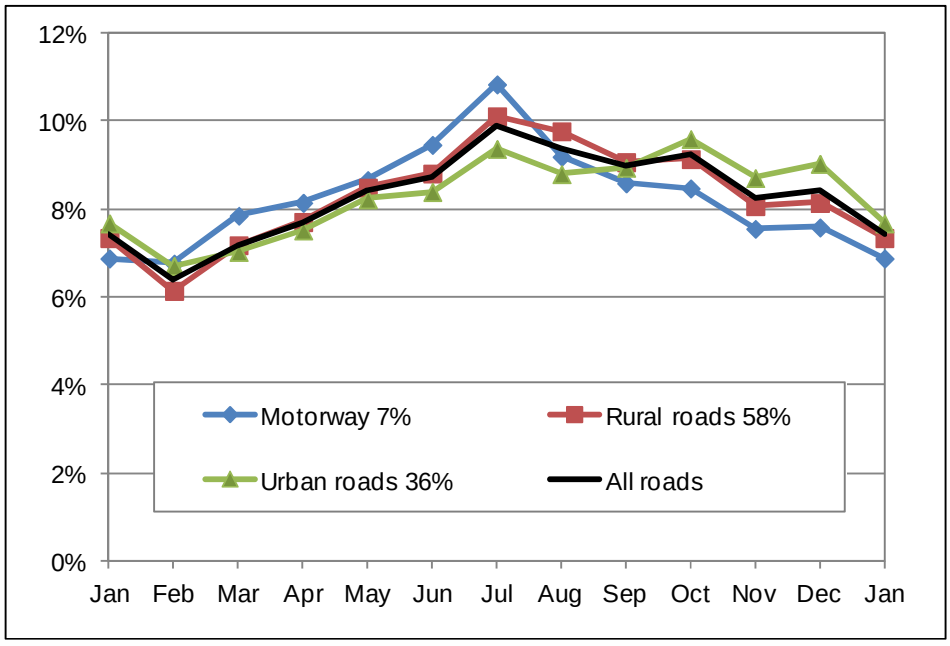
Source: CARE database / EC
Date of query: November 2011

Type of Road

Figure 8 compares seasonality on the three types of road that can be distinguished in the CARE data: motorways, rural roads (excluding rural motorways) and urban roads (excluding urban motorways). There are minor differences; seasonality is less on urban roads than on rural roads and motorways.

[4] The 24 countries listed in Table 1

Figure 8 : Monthly proportion of fatalities by type of road, EU-24 [2], 2005-2009



2008 data are used as a proxy for 2009 data for IE and SE

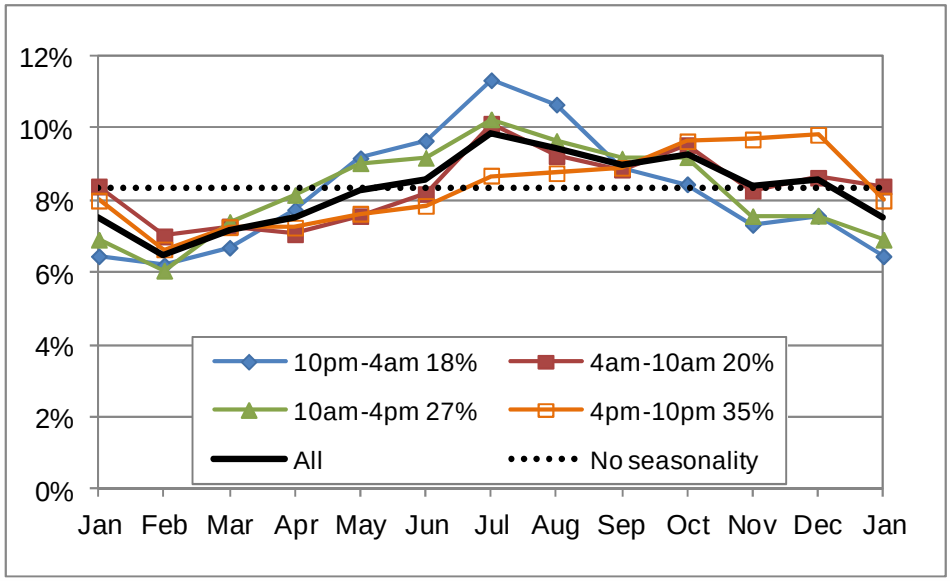
Source: CARE database / EC
Date of query: November 2011

Seasonal variation is less on urban roads than on rural roads and motorways.

Time of Day and Day of Week

Figure 9 compares the fatality proportions in four periods of the day. For example, the Figure shows the proportions of the fatalities that occurred between 10pm and 4am over the five years that occurred in January, February etc. Seasonality is greatest in this period, and least for the 4am-10am period. There is a clear peak in July for the 10pm-4am period, while there is a steady increase from February to December for the 4pm-10pm period.

Figure 9 : Monthly proportion of fatalities by time of day, EU-23[5] 2005-2009



2008 data are used as a proxy for 2009 data for IE and SE

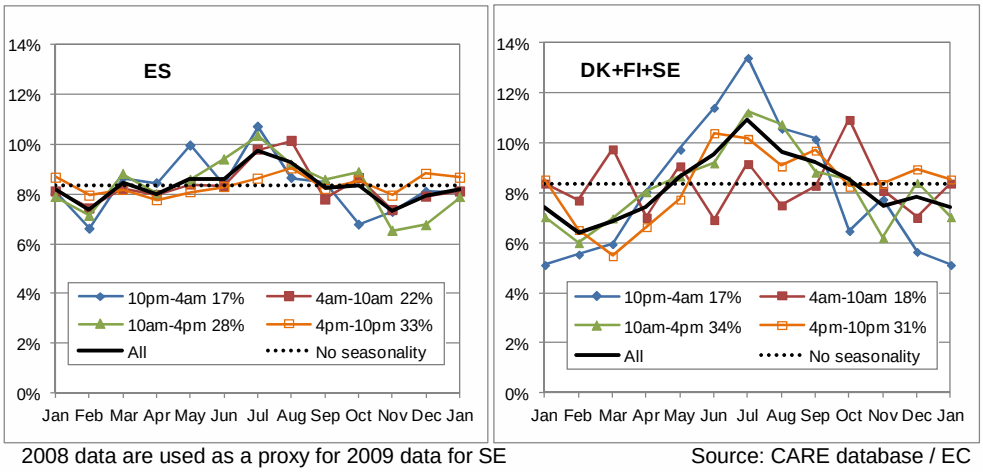
Source: CARE database / EC
Date of query: November 2011

Seasonal variation is greatest for fatalities occurring in the 10pm-4am period and least for the 4am-10am period.

[5] The 24 states listed in Table 1, but DE excluded as hour of day is not reported in the CARE data.

The geographic range of the seasonality of fatalities by time of day is illustrated in Figure 10, which compares the distributions in Spain and the three Scandinavian countries. The Spanish fatality proportions show limited variation by month about the overall trend. The Scandinavian proportions vary considerably by month, however, especially in the late evening (10pm-4am).

Figure 10 : Monthly proportion of fatalities by time of day and country, 2005-2009

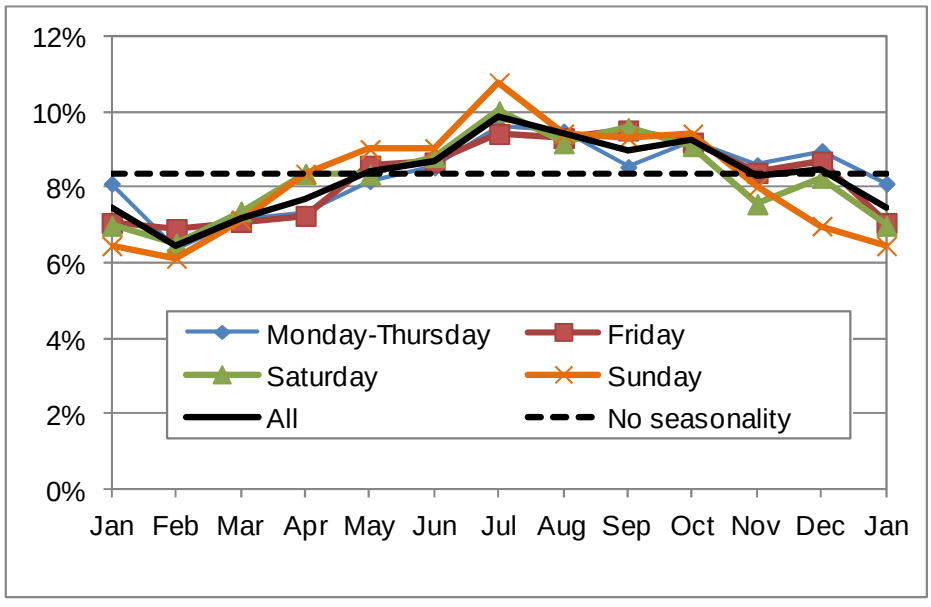


2008 data are used as a proxy for 2009 data for SE

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

Seasonality on each day of the week is similar to overall seasonality. The main difference concerns Sunday: there are relatively many fatalities on Sundays between March and August, and relatively few between November and January.

Figure 11 : Monthly proportion of fatalities by day of week, EU-24 [2], 2005-2009



2008 data are used as a proxy for 2009 data for IE and SE

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

The seasonal variation of fatalities is greater on Sundays than on other days of the week.

Age and Gender

Figure 12 compares seasonality of female and male fatalities by age range. Both male and female fatalities have their minimum values in February; male fatalities peak in July whilst female fatalities peak in July, October and December. There are also clear differences by age range. There is a pronounced peak for 0-17 year old fatalities in July and August, whereas the number of 65+ year old fatalities rises fairly steadily from February to December, especially for women.

The seasonal variation of fatalities depends upon gender as well as age.

Figure 12 : Monthly proportion of fatalities by age and sex, EU-24 [2], 2005-2009

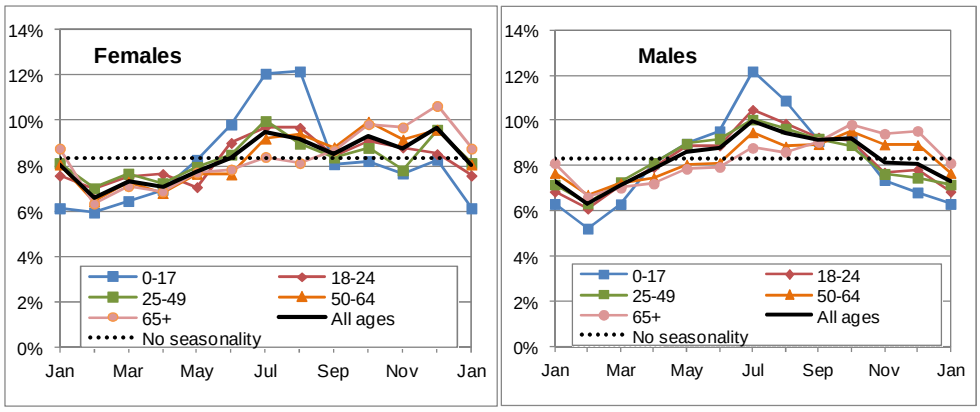


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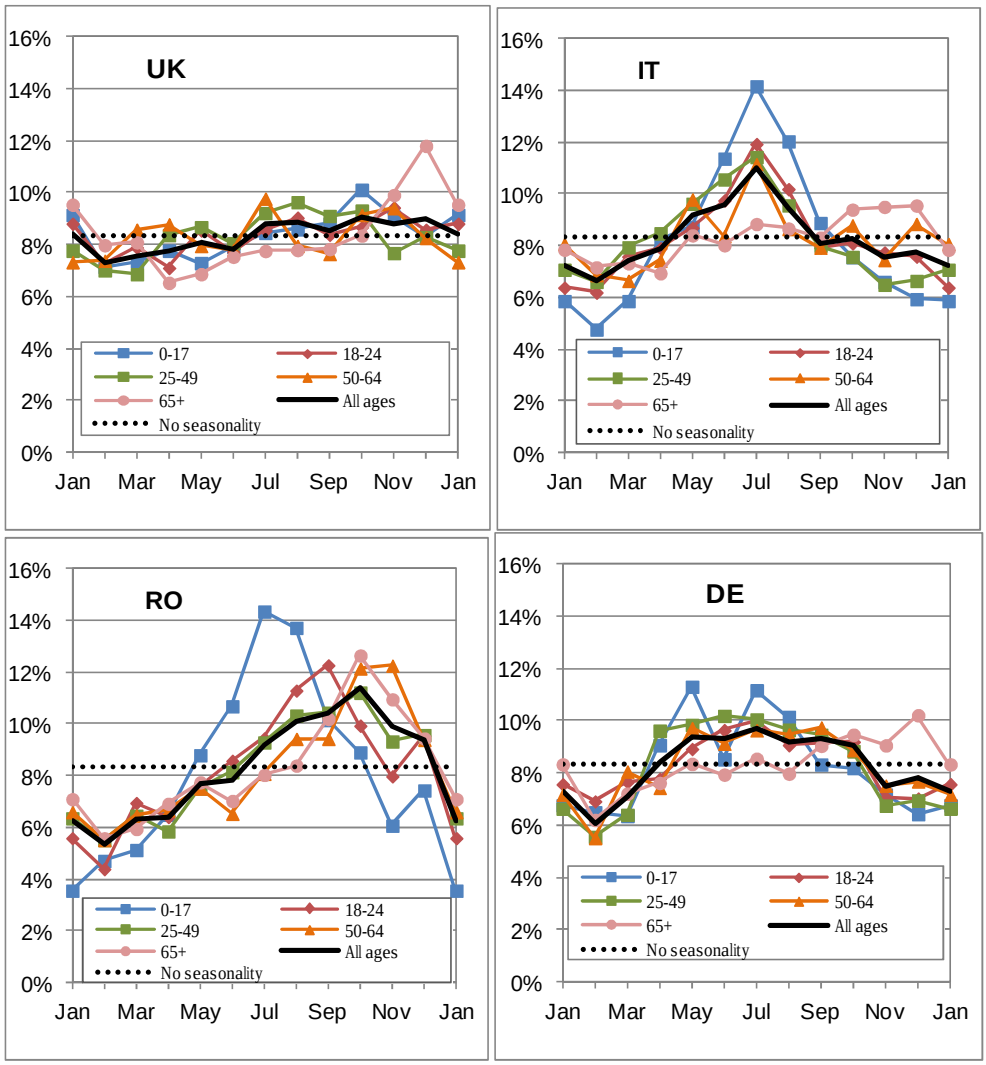
Figure 13 illustrates the range of patterns of seasonality by age around Europe (male and female fatalities combined). There are limited variations about the overall distribution in the UK, but clear differences in Italy and Romania. There are relatively few fatalities aged 65+ during spring and summer in each of the four countries, and a peak in the autumn/winter.

The seasonal variation of fatalities by age and gender differs widely across Europe.

Figure 13: Monthly proportion of fatalities by age in selected countries, 2005-2009



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The clear differences in the seasonal variation of fatalities by age and gender seen in Figure 13 are likely to be influenced by the different travel patterns of the national populations.

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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 - 14	
BE	Belgium
DK	Denmark
IE	Ireland
EL	Greece
ES	Spain
FR	France
IT	Italy
LU	Luxembourg
NL	Netherlands
AT	Austria
PT	Portugal
FI	Finland
SE	Sweden
UK	United Kingdom

EU-24= EU-14 +	
CZ	Czech Republic
DE	Germany
EE	Estonia
HU	Hungary
MT	Malta
LV	Latvia
PL	Poland
RO	Romania
SI	Slovenia
SK	Slovakia

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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