

# **CHARACTERISTICS OF ROAD ACCIDENTS WITH YOUNG PEOPLE IN EUROPE**

*George Yannis, Associate Professor, National Technical University of Athens*

*Petros Evgenikos, PhD Candidate, National Technical University of Athens*

*Panagiotis Papantoniou, PhD Candidate, National Technical University of Athens*

*Alan Kirk, Research Fellow, Loughborough University*

*Pete Thomas, Professor, Loughborough University*

## **ABSTRACT**

Young people, defined as those who are between 18 and 24 years old, are worldwide far more likely to be victims in road accidents than people in any other age group. The objective of this research is the analysis of young people road safety related parameters in European countries through the use of the EU CARE database with disaggregated data on road accidents, as well as of other international data sources (Eurostat, etc.). Time series data from 19 EU countries over a period of 10 years (2000-2009) are correlated with basic safety parameters such as road user type, mode of transport, area and road type, day and time of day, seasonality, age and gender of the driver. During this period more than 76.000 persons aged 18-24 years old were killed in traffic accidents, representing almost a fifth of all traffic accident fatalities in those countries (18%). Moreover, in 2009 17% of people killed in road accidents in the 23 European countries were aged 18-24 years old. However, only 9% of the population falls within this age group. As a result, young people were at almost twice the average risk of being killed in a road accident across the EU-23 countries in 2009 as a whole, underlining the urgency of taking immediate appropriate countermeasures. The results of the analysis allow for an overall assessment of the young people safety level in the European road network in relation to the younger or older road users, providing thus useful support to decision makers working for the improvement of safety in the European road network.

Keywords: Young people; Road fatalities; Road accident data; Road safety; European countries

## **INTRODUCTION**

The increase of mobility during the last years may have improved the everyday life, but has also been followed by a number of adverse effects, the most important of which is the increase of accident rates. Research studies on accident rates have identified specific road user groups that exhibit high risk rates, and are considered to be vulnerable user groups. Young drivers comprise a vulnerable user group and in this paper, are defined as those who are between 18 and 24 years old. Furthermore, for each young driver killed, it is likely that more than 1,3 passengers or other road users are also killed in the same accidents, according to findings from the US and the Netherlands. National accident data from various countries indicate that road accidents involving a young driver account for between 20% and 30% of total road accident fatalities, clearly indicating that young drivers play a disproportionate role in the overall public health problem of road traffic safety risk (OECD, 2006).

The actual causes for the increased risk rates of young drivers arise both from the immaturity of their youth, as well as inexperience errors. For drivers that are both novice and young, the effects of inexperience greatly exceed those of age for the first few years of driving (McKnight and McKnight 2003). Young drivers also tend to violate traffic rules more frequently than other drivers (Reason et al 1991, Aberg and Rimmo 1998), which is related to the 'sensation seeking' behaviour of this specific driver group (Jonah 1997). This behaviour is encountered in experienced young drivers rather than inexperienced ones (Rimmo and Aberg, 1999). Furthermore, young and novice drivers (Pelz and Schumann 1971) are prone to make driver decision errors. Novice drivers that are involved in complex traffic situations are the least probable to judge the situation appropriately and respond in the required manner because of their limited perception of the situation (Fuller 1988, McGwin and Brow 1999). Another attribute that leads in decision errors for novice drivers is the overrating of their driving abilities (Edwards 2001), which usually decreases with their involvement into an accident (Bliersbach and Dellen 1980). All the above primary factors lead in high risk rates of young drivers under specific situations (Yannis et.al., 2007).

The objective of this research is the analysis of young people road safety related parameters in European countries through the use of the EU CARE database with disaggregated data on road accidents, as well as of other international data sources (Eurostat, etc.). Accident data from 23 EU countries over a period of 10 years (2000-2009) are correlated with basic safety parameters such as road user type, mode of transport, area and road type, day and time of day, seasonality, age and gender of the driver.

Table I summarizes the definition of the country abbreviations that are used in the paper. It has to be underlined that for all presented statistics (where specific dates are not indicated), latest available data are used and where a number is missing for an EU-19/23 country in a particular year, its contribution to the EU-19/23 total is estimated as the closer known value.

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Table I – Definition of used country abbreviations

EU-19		EU-23=EU19+	
Belgium	BE	Estonia	EE
Czech Republic	CZ	Latvia	LV
Denmark	DK	Hungary	HU
Germany	DE	Slovakia	SK
Ireland	IE		
Greece	EL		
Spain	ES		
France	FR		
Italy	IT		
Luxembourg	LU		
Netherlands	NL		
Austria	AT		
Poland	PL		
Portugal	PT		
Romania	RO		
Slovenia	SI		
Finland	FI		
Sweden	SE		
United Kingdom	UK		

## OVERALL TRENDS

The trends of the overall number of fatalities and of young people fatalities in 19 European Union countries are shown in Figure I. More than 76.000 persons aged 18-24 years old were killed in traffic accidents in 19 European Union countries within the decade 2000 - 2009. This number represents almost a fifth of all traffic accident fatalities in those countries (18%). Furthermore, the number of young people killed in road accidents in 2009, was 44% less than the respective number in 2000 while the total number of fatalities also fell by 38% in the 19 European Union countries over the same period.

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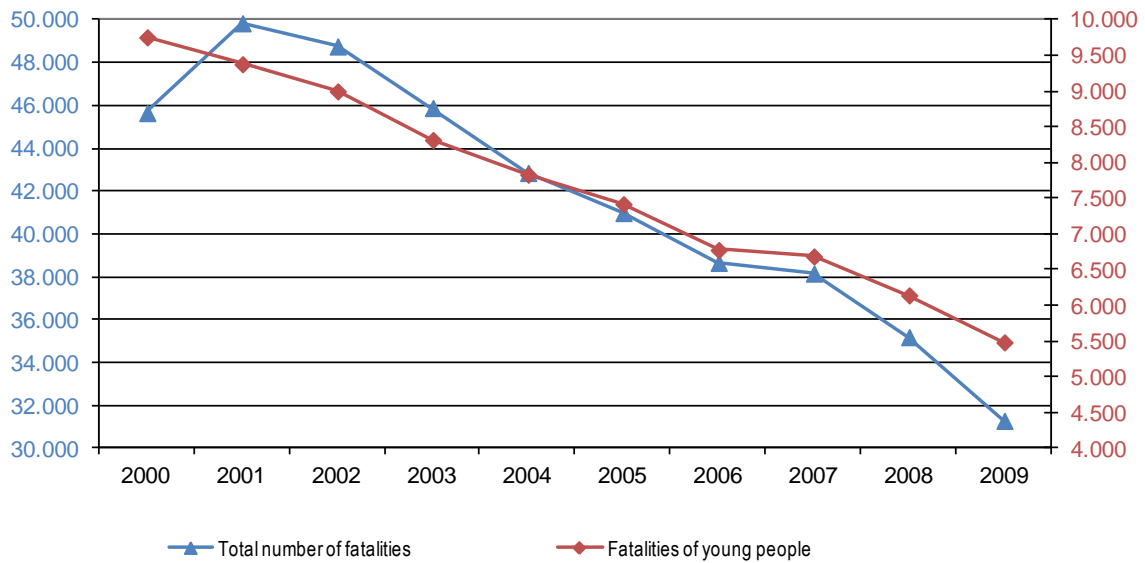


Figure I – Distribution of road traffic fatalities in the EU-19 2000-2009

More specifically, in 2009, the number of young people killed in Slovakia was 42% less than in 2008, and the reduction in Czech Republic was 31% while most significant reduction occurred in Portugal (69%). On the other hand, the number increased in Luxembourg (25%), Netherland (18%) and Finland (2%).

Furthermore, 17% of people killed in road accidents in 2009 in the 23 European countries were aged 18-24. However, only 9% of the population falls within this age group. Young people were at almost twice the average risk of being killed in a road accident across the EU-23 countries in 2009 (this is the relative fatality rate, calculated as the % young people fatalities divided by % young people population).

As shown in Figure II, Ireland has the highest relative rate (2,9) whereas Hungary and Latvia have the lowest relative rate (1,1) among the 23 countries in 2009.

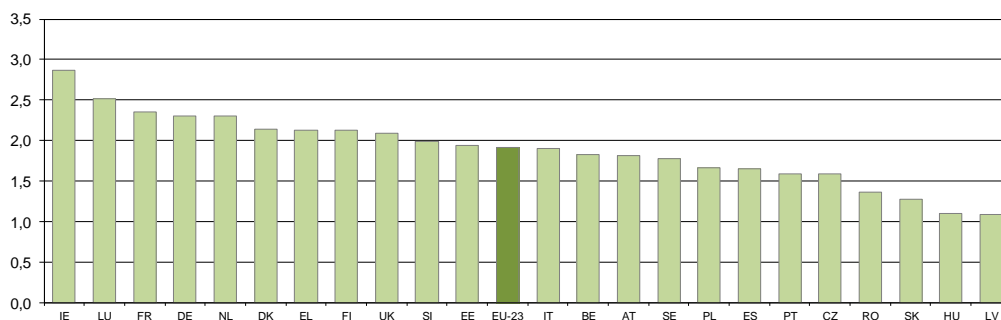


Figure II – Relative rate for fatality proportions in young people, 2009

The number of fatalities amongst young people, expressed as a proportion of all fatalities, has been gradually reducing over the last ten years, although this is not the case in every country.

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The proportion of fatalities who were aged 18-24 per country for the decade 2000-2009 is presented in Table II.

Table 2 – Proportion of fatalities who were aged 18-24 by country, 2000-2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BE	22%	19%	20%	20%	21%	18%	18%	20%	19%	16%
CZ	17%	18%	16%	17%	16%	17%	17%	16%	18%	15%
DK	17%	16%	16%	16%	18%	16%	21%	14%	17%	18%
DE	23%	23%	23%	21%	22%	20%	20%	20%	20%	19%
IE	28%	28%	21%	24%	26%	28%	26%	23%	27%	-
EL	18%	21%	17%	18%	18%	20%	18%	17%	16%	17%
ES	19%	18%	18%	18%	17%	17%	15%	14%	15%	13%
FR	21%	22%	22%	21%	23%	23%	22%	21%	22%	21%
IT	17%	15%	16%	15%	16%	16%	15%	14%	13%	14%
LU	21%	23%	16%	19%	16%	19%	19%	17%	23%	21%
NL	21%	16%	21%	17%	19%	16%	15%	19%	16%	20%
AT	21%	20%	18%	19%	19%	18%	18%	20%	20%	16%
PL	-	16%	16%	16%	15%	17%	17%	17%	17%	18%
PT	19%	20%	16%	16%	17%	18%	13%	15%	13%	13%
RO	12%	13%	11%	12%	12%	11%	11%	14%	14%	15%
SI	16%	19%	21%	21%	18%	17%	21%	22%	18%	18%
FI	13%	19%	18%	16%	20%	14%	20%	20%	15%	18%
SE	17%	17%	18%	18%	16%	15%	17%	18%	16%	-
UK	18%	19%	20%	21%	22%	21%	21%	21%	21%	20%
EU-19	19,1%	18,8%	18,5%	18,1%	18,3%	18,1%	17,5%	17,5%	17,5%	17,2%
EE	-	-	-	-	-	15%	17%	21%	21%	21%
LV	-	-	-	-	14%	14%	15%	11%	15%	12%
HU	-	-	-	10%	11%	12%	10%	11%	10%	10%
SK	-	-	-	-	-	14%	16%	13%	15%	14%
EU-23	-	-	-	-	-	17,8%	17,3%	17,2%	17,2%	16,9%
CH	-	-	-	-	-	29%	27%	33%	22%	13%

## AGE, ROAD USER TYPE AND MODE OF TRANSPORT

The majority of the young people (18-24) killed in road accidents in the 23 European countries were drivers (3.778, corresponding to 67% of all fatalities at that age group), whereas only 6% (365) were pedestrians in 2009 as presented in Figure III.

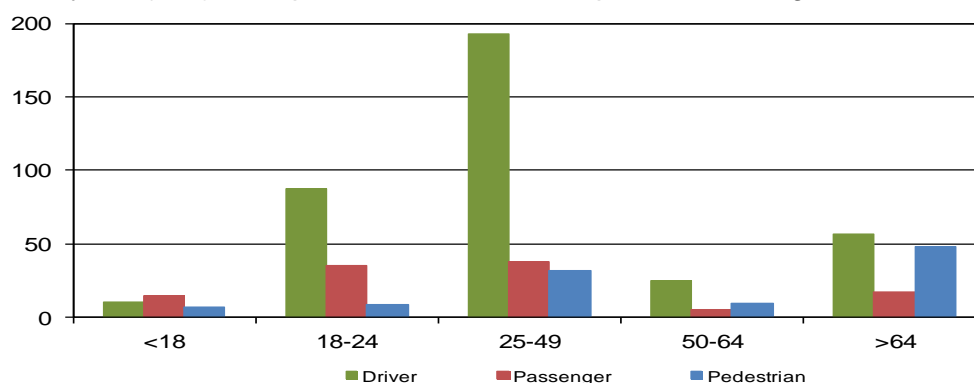


Figure III – Rate of fatalities per million population by age group for drivers, passengers and pedestrians, EU-23, 2009

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Additionally, more than two-thirds of fatalities of young people across the European countries are in cars or taxis, with mopeds and motorcycles accounting for 22% in the EU-23 countries. According to Figure IV shows that the highest proportion among the 23 European countries of young people fatalities by mode of transport in 2009 was in Finland (86% were travelling by car/taxi). The second highest proportion of young people fatalities by car/taxi was in Denmark (83%) whereas the lowest car/taxi proportion was in Greece and Portugal 48%.

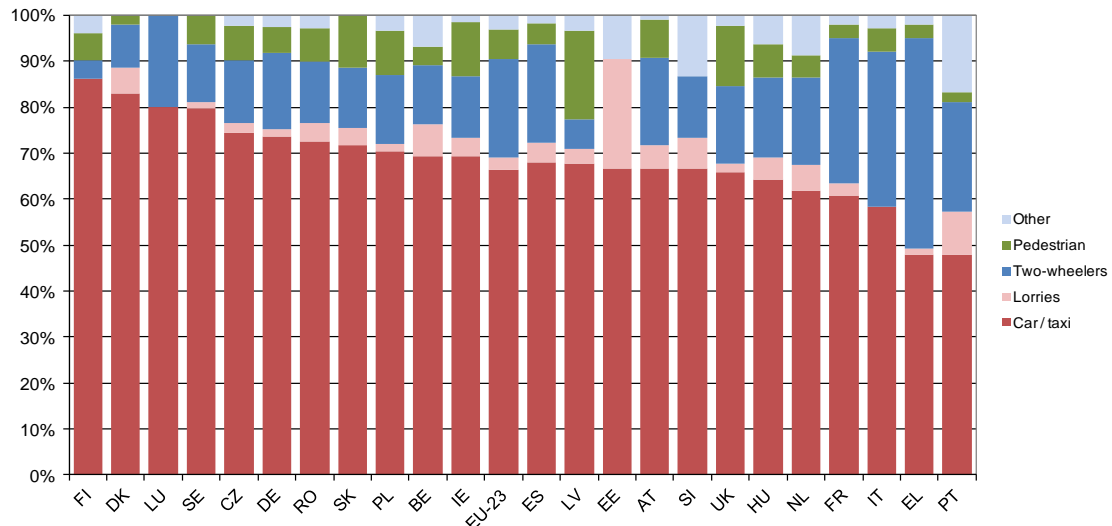


Figure IV – Proportion of young (or 18-24 years old) fatalities by mode of transport, 2009

Figure IV shows as well that as far as two-wheeler fatalities (users of motorcycles, mopeds or pedal cycles) are concerned, the lowest proportion was in Finland (4%). Greece had the highest proportion of 18-24 year old two-wheeler fatalities (46%) among the 23 countries considered, Estonia had the highest proportion of young people fatalities in lorries (24%) and Latvia had the highest proportion of young pedestrian fatalities (19%) whereas Estonia and Slovenia did not have any.

## CORRELLATION WITH OTHER BY ROAD SAFETY PARAMETERS

### Classification by gender

Figure V visualises that 81% of the fatalities among young people were men. Moreover, males have a significantly higher fatality rate per million inhabitants (107), compared to females (25). Furthermore, research has revealed that they are generally more inclined toward risk-taking, sensation seeking, speeding and anti-social behaviour than their female counterparts. They are also more likely to over-estimate their driving abilities and more susceptible to the influence of their friends (OECD, 2006)

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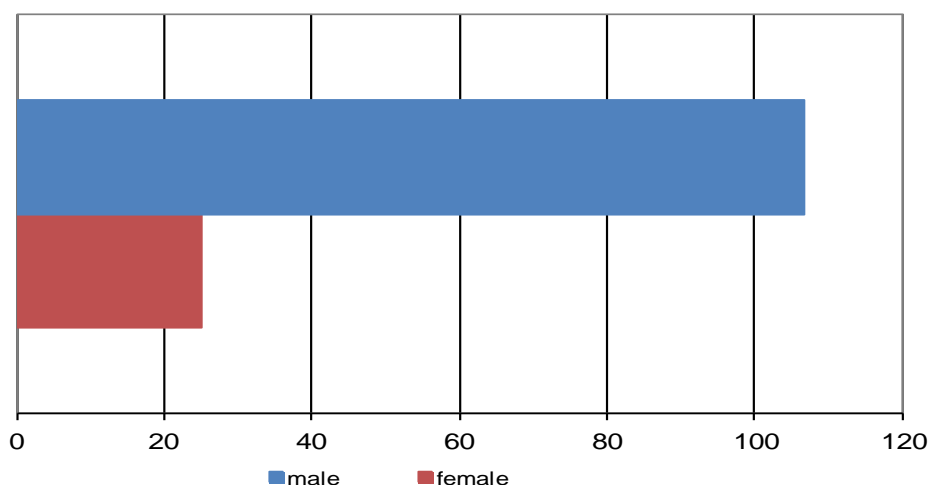


Figure V – Young people fatality rates per million inhabitants, per gender in the EU-23, 2009

### Classification by area and road type

In the EU-23, the majority (60%) of young fatalities occurred outside urban areas (excluding motorways) in 2009 and only 15% occurred on motorways. The percentage of young people fatalities inside urban areas was 33% for the EU-23 countries as presented in the following table.

Table III – Distribution of fatalities amongst young people by area and road type, 2009

	inside urban area	outside urban area		
		motorway	non-motorway	not defined
BE	21%	18%	57%	3%
CZ	27%	1%	72%	0%
DK	23%	8%	70%	0%
DE	18%	10%	71%	0%
EE	10%	0%	90%	0%
IE	21%	0%	0%	79%
EL	50%	6%	43%	0%
ES	21%	2%	77%	0%
FR	28%	4%	68%	0%
IT	42%	8%	50%	0%
LV	35%	0%	65%	0%
LU	0%	100%	0%	0%
HU	28%	5%	67%	0%
NL	25%	17%	57%	0%
AT	17%	5%	78%	0%
PL	42%	0%	58%	0%
PT	50%	9%	41%	0%
RO	52%	1%	47%	0%
SI	30%	23%	47%	0%
SK	28%	4%	68%	0%
FI	31%	0%	69%	0%
SE	16%	3%	81%	0%
UK	41%	5%	54%	0%
EU-23	33,2%	5,6%	60,2%	1,1%
CH	21%	15%	65%	0%

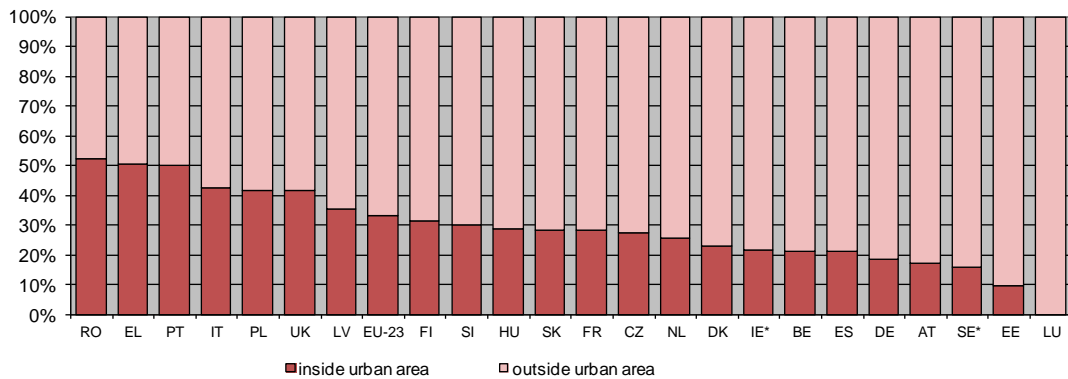


Figure VI – Distribution of fatalities amongst young people by area type, 2009

Figure VI shows that in 2009 Estonia had the lowest percentage of young people fatalities inside urban areas (10%) whereas Romania had the highest percentage (52%) amongst the EU-23 countries.

### Classification by day of week and time of day

Figure VII shows that in 2009 more people aged 18-24 were killed between 06:00 and 20:59 on week-days in the EU-23 countries than between 21:00 and 5:59 (the night-time and early morning). On the contrary, more young people were killed between 21:00 and 5:59 during the weekends, when young people tend to stay out until late.

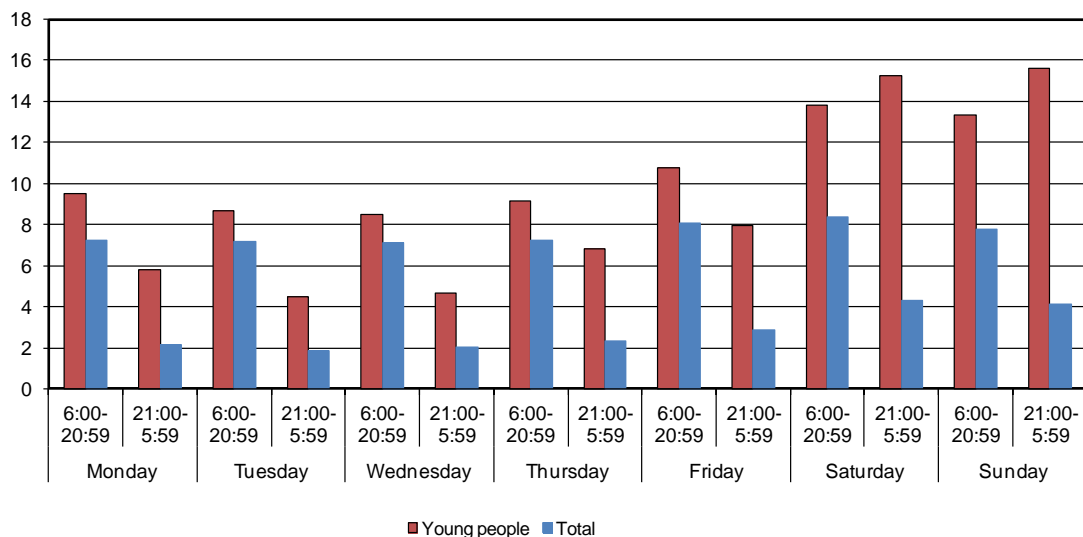


Figure VII – Fatality rates per million inhabitants, by day of week and time of day in the EU-23, 2009

Table IV shows that in 2009 in the EU-23 countries, almost half (43%) of young people killed died at the week-end. The proportions are lower between Tuesday and Wednesday.



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Table IV – Distribution of fatalities amongst young people by day of week, 2009

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
BE	11%	12%	8%	9%	10%	33%	18%
CZ	14%	13%	8%	11%	16%	24%	14%
DK	11%	11%	6%	6%	19%	26%	21%
DE	12%	11%	10%	12%	15%	19%	22%
EE	5%	5%	19%	19%	5%	29%	19%
IE	11%	9%	9%	15%	9%	20%	27%
EL	12%	12%	9%	11%	13%	17%	26%
ES	10%	11%	10%	11%	14%	23%	23%
FR	12%	10%	10%	13%	14%	21%	21%
IT	11%	10%	9%	13%	11%	21%	25%
LV	10%	3%	19%	16%	16%	32%	3%
LU	0%	10%	0%	20%	30%	10%	30%
HU	11%	7%	9%	21%	24%	12%	16%
NL	12%	5%	14%	14%	18%	19%	20%
AT	12%	11%	12%	18%	9%	17%	20%
PL	12%	8%	9%	13%	15%	21%	23%
PT	13%	13%	16%	8%	9%	27%	15%
RO	10%	10%	11%	11%	16%	18%	24%
SI	7%	20%	13%	10%	23%	17%	10%
SK	17%	15%	8%	4%	25%	23%	9%
FI	14%	10%	8%	10%	14%	29%	16%
SE	15%	12%	5%	15%	8%	20%	25%
UK	11%	9%	11%	9%	15%	26%	21%
EU-23	11,4%	10,0%	9,8%	11,9%	14,0%	21,3%	21,5%
CH	6%	6%	9%	9%	19%	31%	21%

## Seasonality

Table V shows the distribution of road traffic fatalities amongst young people through the year, using pairs of months, with the totals displayed in Figure 8 on a monthly basis.

Table V – Distribution of fatalities amongst young people by month, 2009

	January/ February	March/ April	May/ June	July/ August	September/ October	November/ December
BE	12%	17%	20%	18%	14%	18%
CZ	14%	14%	17%	26%	17%	13%
DK	23%	30%	13%	9%	13%	11%
DE	13%	16%	20%	17%	19%	15%
EE	33%	19%	5%	33%	5%	5%
IE	19%	20%	16%	17%	15%	13%
EL	12%	18%	17%	22%	19%	12%
ES	18%	14%	15%	18%	18%	16%
FR	13%	16%	19%	18%	21%	14%
IT	13%	15%	16%	23%	17%	15%
LV	16%	13%	19%	19%	3%	29%
LU	0%	20%	10%	20%	50%	0%
HU	6%	22%	24%	20%	16%	12%
NL	12%	14%	23%	14%	19%	18%

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AT	18%	9%	22%	20%	19%	11%
PL	11%	16%	18%	23%	19%	13%
PT	7%	14%	9%	28%	26%	16%
RO	14%	13%	15%	22%	23%	13%
SI	17%	20%	27%	3%	23%	10%
SK	8%	17%	25%	23%	17%	11%
FI	12%	10%	29%	20%	22%	8%
SE	13%	12%	13%	25%	22%	15%
UK	17%	18%	16%	20%	16%	13%
EU-23	13,5%	15,8%	17,8%	20,0%	18,9%	14,1%
CH	10%	10%	16%	22%	21%	21%

The peak period for most of the countries is in July/August, though Denmark, Hungary and Ireland have their peak in March/April, the peak in the Netherlands, Austria, Belgium, Germany and Slovenia is in May/June, while for France and Luxembourg the peak is in September/October while fewest fatalities occur in January/February.

In EU-23 the proportion of fatalities aged 18-24 is relatively high in July and August, and relatively low between January and April in 2009.

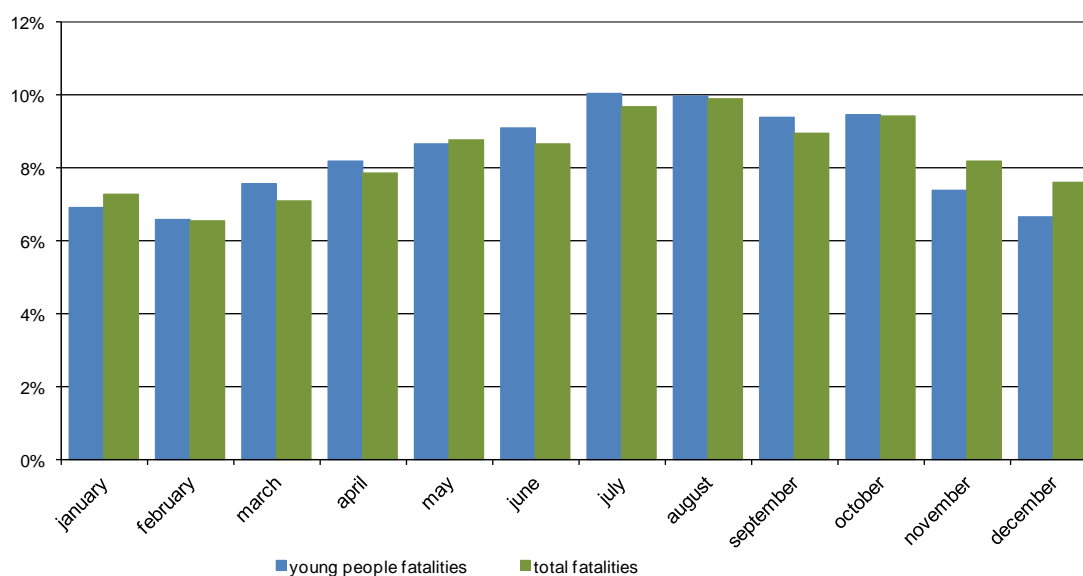


Figure VIII – Distribution of total and young people fatalities by month in the EU-23, 2009

As indicated in Figure VIII the highest proportion of young people fatalities in 2009 occurred in August (10%) in the EU-23 countries, whereas the lowest proportion is observed in February (7%). As far as total fatalities are concerned, the highest proportion of total fatalities occurred in July (10%) and in August (10%), whereas the lowest proportion is noted in February (7%).

## **DISCUSSION**

The great over-representation of young drivers in accidents and road fatalities is a serious public health problem that exacts an unacceptable toll in human, social and economic terms. Young drivers comprise a road user group that exhibits high risk rates due to youth immaturity and driving inexperience, and special attention should be given to the design of targeted road safety measures.

The objective of this research is the analysis of young people road safety related parameters in European countries through the use of the EU CARE database with disaggregated data on road accidents, as well as of other international data sources (Eurostat, etc.). In 2009 17% of people killed in road accidents in the 23 European countries were aged 18-24. However, only 9% of the population falls within this age group. As a result, young people were at almost twice the average risk of being killed in a road accident across the EU-23 countries in 2009 as a whole which underlines the urgency of taking immediate appropriate counter measures. On the other hand, the number of fatalities amongst young people, expressed as a proportion of all fatalities, has been gradually reducing over the last ten years, although this is not the case in every European country.

These observations, along with the other findings presented in this paper, could be used to shape public policy in a way that it improves road safety across the board and especially for the more vulnerable road users. In view of setting targets, increase public awareness of the problem should be take place immediately. This could involve undertaking communications campaigns, based on well-researched information, sensitising the public to the nature of the risk and encouraging changes in attitudes and behaviour. Furthermore, the combination of other countermeasures, particularly enforcement, with communications can yield changes in attitudes towards safety risk over the longer term. Moreover, in addressing this problem, important reductions in young driver risk can result from effective legislation, intensification of enforcement and development of appropriate standards, particularly dealing with speed, alcohol, drugs and seatbelts.

The results of the analysis allow for an overall assessment of young people safety level in the European road network, providing thus useful support to decision makers working for the improvement of safety in the European road network. Certainly the effort of data-collection is an on-going challenge and there are additional data that could help shed light to the problem of road safety. Of particular interest are exposure data (traffic volumes, veh-kms and person-kms by age). Furthermore, the macroscopic analysis presented in this paper could in the future be combined with in-depth analysis of young people, thus providing a better insight into the causes and impacts of young people road accidents and fatalities.

## ACKNOWLEDGMENT

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