

Public Health Profile of Road Traffic Accidents in Kosovo 2010-2015

Naser Ramadani^{1,2}, Valbona Zhjeqi^{1,2*}, Merita Berisha^{1,2}, Rina Hoxha^{1,2}, Ilir Begolli^{1,2}, Drita Salihu^{1,2}, Pranvera Krasniqi²

¹Faculty of Medicine, Hasan Prishtina University, Prishtina 10000, Kosovo; ²National Institute of Public Health of Kosova, Prishtina 10000, Kosovo

Abstract

Citation: Ramadani N, Zhjeqi V, Berisha M, Hoxha R, Begolli I, Salihu D, Krasniqi P. Public Health Profile of Road Traffic Accidents in Kosovo 2010-2015. Open Access Maced J Med Sci. <https://doi.org/10.3889/oamjms.2017.214>

Keywords: Road traffic accidents; Public health problem; traffic injuries; traffic mortality; Kosovo.

***Correspondence:** Valbona Zhjeqi, Faculty of Medicine, Hasan Prishtina University, Prishtina 10000, Kosovo; National Institute of Public Health of Kosova, Prishtina 10000, Kosovo. E-mail: valbona_zhjeqi@yahoo.com

Received: 12-Jul-2017; **Revised:** 06-Sep-2017; **Accepted:** 18-Oct-2017; **Online first:** 13-Dec-2017

Copyright: © 2017 Naser Ramadani, Valbona Zhjeqi, Merita Berisha, Rina Hoxha, Ilir Begolli, Drita Salihu, Pranvera Krasniqi. This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0).

Funding: This research did not receive any financial support.

Competing Interests: The authors have declared that no competing interests exist.

AIM: To determine the characteristics of the Socio-medical profile of road traffic accidents in Kosovo, between 2010 and 2015 year.

STUDY DESIGN: Retrospective study.

METHODS: A descriptive method based on the database of road traffic accidents from the National Police of Kosovo.

RESULTS: In Kosovo for the period 2010-2015, on average, the yearly number of road traffic accidents is 18437 with mortality rate 7.4 per 100000 and lethality of 1.5%. The highest number of fatal cases are drivers and above 19 years old with more than 80%. Among injured significantly highest percentage is among passengers for all years and above 19 years old. Road traffic accident with a vehicle occurs most frequently, with approximately over 70%, mostly on dry road 72.9% and clear weather 71.1%. The driver is the contributing factors of road traffic accidents on average 99.3% whereas climatic conditions only 0.5%, with over 50% of crashes occurring in urban road 56.2%, mostly during Monday 16.0% and in the afternoon rush hours between 14.00-18.00 with 31.0%.

CONCLUSIONS: There is a slight decrease in the mortality rate of 0.1‰ and lethality rate of 0.1% each year, whereas there is an increase of 21.5‰ for traumatism rate for each year.

Introduction

Road traffic accidents are the major public health problem, in both developed and developing countries. Based on WHO report, the overall global road traffic fatality rate is 17.4 per 100000. Low-income countries have the highest annual road traffic fatality rates, 24.1 per 100000, middle-income countries 18.4 while the rate in high-income countries is lowest, at 9.2 per 100000 [1]. Traffic mortality, traumatism, absenteeism, and disabilities have an impact not only each victim but also on their families and wider society at the national level of pandemic proportions with medical, psychological, economic and quality of life consequences. According to WHO report road traffic injuries are the eighth leading cause of death globally, and the leading cause of death for

young people aged 15–29 years. Globally, more than a million people die annually. Approximately, 90% of the world's fatalities on the roads occur in low and middle-income countries [1]. The rapid increase in road traffic crashes in low and middle-income countries has driven an overall global increase in deaths and injuries due to the rapid rate of motorization and lack of prioritization for several years of safety strategies, disordered urbanization which causes financial costs up to 3–5 % of their gross national product whereas consequences of these road traffic accidents cost up billions of dollars due to the cost of treatment, rehabilitation lost productivity and incident investigation [1].

The annual cost of road traffic accident in Australia, in 2003, was about 2.3% of the Gross Domestic Product (GDP) [2]. For the same year, in Barcelona total costs of road traffic accidents were

367 million euro with (89.8%) direct costs equalled euro 329 million, including property damage costs, insurance administration costs, and hospital costs [3]. In Iran, traffic accident costs were US\$2.2 million in 2007 [4] while in Kuwait cost per traffic fatality is more than the US \$500,000 [5].

In Kosovo, a country in transition with the improper and non-strict implementation of road security measures, inappropriate land use planning, an increase of the number of cars and particularly imported old cars from the second-hand European Union market increases the risk for traffic insecurity together with lack of proper road infrastructure and urban spatial planning, characteristic for developing countries.

Public health importance of road traffic accidents stands because they are largely preventable with traffic security cost-beneficial and cost-effective measures. Consequences are not only health related but also economic and social too.

This study aims to determine socio-medical characteristics of road traffic accidents in Kosovo, between 2010 and 2015 by exploring trend in road traffic accidents, fatal and non-fatal accidents, type, contributing factors, the site, superficial road conditions, time, day of the week and climatic condition of occurrence.

Methods

For this study, a retrospective study of road traffic accidents in the period from January 2010 to December 2015 was conducted. As descriptive study based on a database of road traffic accidents of Kosovo National Police and demographic data (2010 - 2015) from Statistical Agency of Kosovo, therefore we did not need any ethical approval since data are anonymous, presented by gender and age group.

The information provided by the National Police of Kosovo included the 2010-2015 databases, in Excel format. This information allowed the analysis of the following variables: number of accidents, type, contributing factors, the day of the week, time of occurrence, climatic conditions, and road users involved by age, the place, superficial road conditions, distributions of the accidents. A limitation of the database is the lack of disaggregated age data. From the database, incidence, mortality and lethality indicators are calculated. The incidence was determined by the number of new cases of road traffic accidents deaths and injuries that occurred during 2010-2015. Mortality was calculated by dividing the number of deaths among the total susceptible population, according to the Kosovo Statistical Agency per 100.000 inhabitants whereas lethality by dividing

the number of deaths on the number of injured persons by road traffic accidents per 100. The statistical analysis reported frequencies, percentages, trends and chi-square statistical significance test. For the study purpose statistical program Excel, 2016 was used.

Results

According to the Statistics of the National Police of Kosovo, for the period 2010-2015, there have been 110622 road traffic accidents at the national level. Regarding mortality, between the years 2010-2015, road traffic accidents have caused 826 deaths nationwide. The year 2010 had the highest number of deaths in the country 175. For the period 2010-2015, 54809 injured people are recorded, with an average yearly number of road traffic accidents 18437, annually average of dead persons 138, injured 9135 and average mortality of 7.4 per 100.000, average traffic traumatism 497.6 per 100.000 and average lethality of 1.5%.

Table 1: Traffic accidents and related health indicators, Kosovo 2010-2015

Year	Population	Accidents	Ib	Iv	Dead	Injured	Mt per 100000	Tr per 100000	Le per 100
2010	2207000	18030	100.0	-	175	7730	7.9	350.2	2.3
2011	1739825	18888	104.8	104.8	157	8321	9.0	478.3	1.9
2012	1793000	19754	109.6	104.6	121	8561	6.7	477.5	1.4
2013	1820631	19928	110.5	100.9	117	9813	6.4	539.0	1.2
2014	1804944	16300	90.4	81.8	127	9713	7.0	538.1	1.3
2015	1771604	17722	98.3	108.7	129	10671	7.3	602.3	1.2
Average		18437	-	-	138	9135	7.4	497.6	1.5

The basic index shows an increase of road traffic accidents for period 2010-2013 and in 2014 show decrease of 9.6%, for 2015 decrease of 1.7%. Verig index show similarly increases for the same period 2010-2013, and for 2014 there is a decrease of 18.6% and 8.7% for 2015. According to trend analysis, there is a slight decrease of the mortality rate of 0.1 ‰ and lethality rate of 0.1% each year whereas there is an increase of 21.5‰ for traumatism rate for each year (Table 1).

Table 2, shows trend and statistical significance for the period 2010-2015. For death cases, the trend is decreasing on average for nine new cases each year and for injuries increase of 575.2 new cases, and for victims in general also, increase for 566 each year. For years there is statistical significance for $p < 0.00$ for death cases with the highest number recorded on 2010 and for injuries highest number for 2015. We can notice that while the number of accidents is falling, the number of fatal cases is decreasing and the number of victims and injuries increasing (Table 2).

Regarding age group, highest percentage is

among victims with above 19 years with more than 80% during period 2010-2015 and least percentage among adolescents 13-18 years old but there is no statistical significance (Table 3).

Table 2: Victims of traffic accidents, Kosovo 2010-2015

Year	Dead		Injured		Victims	
	N	%	N	%	N	%
2010	175	21.2	7730	14.1	7905	14.2
2011	157	19.0	8321	15.2	8478	15.2
2012	121	14.6	8561	15.6	8682	15.6
2013	117	14.2	9813	17.9	9930	17.8
2014	127	15.4	9713	17.7	9840	17.7
2015	129	15.6	10671	19.5	10800	19.4
Total	826	100.0	54809	100.0	55635	100.0
Trend	$y = 170.07 - 9.2571x$		$y = 7121.5 + 575.23x$		$y = 7291.6 + 565.97x$	
X2, FD=5	0.0017		0.000		0.000	

Among injured according to their involvement in traffic, highest percentage is among passengers for all years and the smallest percentage is among pedestrians, the statistically significant difference (p=0.0001). Age group, similarly above 19 years old are mostly injured for entire period with a statistically significant difference (p = 0.000) (Table 3).

Table 3: Dead and injured according to their involvement in traffic accidents and age-group, Kosovo 2010-2015

Year	Dead persons						X ² -test FD=10 8.789
	Drivers		Passenger		Pedestrian		
	N	%	N	%	N	%	
2010	61	34.9	54	30.9	60	34.3	p=0.552
2011	57	36.3	55	35.0	45	28.7	
2012	44	36.4	35	28.9	42	34.7	
2013	37	31.6	47	40.2	33	28.2	
2014	49	38.6	39	30.7	39	30.7	
2015	48	37.2	33	25.6	48	37.2	
Year	Dead persons according age-group						X ² -test FD=10 4.589
	0-12		13-18		19+		
	N	%	N	%	N	%	
2010	17	9.7	8	4.6	150	85.7	p=0.917
2011	15	9.6	10	6.4	132	84.1	
2012	11	9.1	5	4.1	105	86.8	
2013	13	11.1	7	7.7	95	81.2	
2014	8	6.3	7	5.5	112	88.2	
2015	10	7.8	6	4.7	113	87.6	
Year	The injured						X ² -test FD=10 33.825
	Drivers		Passenger		Pedestrian		
	N	%	N	%	N	%	
2010	2938	38.0	3741	48.4	1053	13.6	0.0001
2011	3222	38.7	4072	48.9	1027	12.3	
2012	3309	38.7	4223	49.3	1029	12.0	
2013	3757	38.3	4814	49.1	1242	12.7	
2014	3675	37.8	4822	49.6	1216	12.6	
2015	4099	38.4	5396	50.6	1176	11.0	
Year	The injured according to age group						X ² -test FD=10 134.889
	0-12		13-18		19+		
	N	%	N	%	N	%	
2010	856	8.5	436	5.8	6839	85.9	0.000
2011	827	7.5	701	8.4	6993	84.0	
2012	830	7.4	644	7.5	7287	85.1	
2013	753	7.7	601	6.1	8459	88.2	
2014	783	8.1	588	6.0	8344	85.9	
2015	908	8.5	525	4.9	9240	86.6	

Road traffic accidents are caused by three main factors, human, motor vehicles, and environmental conditions. In Kosovo for the period 2010-2015, an accident with a vehicle is most frequent, with approximately over 70% during the entire period, followed by vehicle to vehicle with average 8%. Regarding contributing factors, the driver is responsible for an average of 99.3% for entire period 2010-2015 whereas climatic conditions only 0.5% and technical vehicle condition 0.1%. Among superficial road conditions in road traffic accidents, dry

road recorded mostly with average 72.9% for the entire period, followed by wet road with 14.2%, snow 3.3% and icy road only 1.2%. As far the climatic conditions, most accidents happened in clear weather with 71.1%, cloudy 8.5%, fog 1.0% with snow 4.3%. Most crashes occur in the afternoon rush hours between 14.00-18.00 with 31.0%, followed by 10.00-14.00 with 27.9% and followed by 18.00-22:00 with 18.9%. Over 50% of crashes occurred in the urban road with an average of 56.2% followed by national road with 24.3% and rural road with 9.5%. Most of these crashes take place during Monday with an average of 16.0%, followed with 15.0% for Tuesday, Wednesday, Friday and at least on Sundays with 10.8%. There is no statistically significant difference between years and all above-analyzed modalities (Table 4).

Table 4: Traffic accidents characteristics, Kosovo 2010-2015

Accident Type	Year												X ² -test
	2010		2011		2012		2013		2014		2015		
	N	%	N	%	N	%	N	%	N	%	N	%	
Accidents	19030	190.0	18988	190.0	19744	190.0	19928	190.0	16200	190.0	17722	190.0	p=0.001
Accident with a vehicle	12407	65.2	12508	65.8	14466	73.2	14953	75.0	11437	70.2	12717	71.8	
Vehicle - Vehicle	1486	8.2	1217	6.4	1268	6.4	1407	7.1	1916	9.3	1537	8.7	
Vehicle - Train	1007	5.8	1157	6.1	1001	5.1	1441	7.2	996	4.3	815	4.6	
Vehicle - Bike	982	5.3	904	4.8	881	4.4	1073	5.4	1074	6.6	1051	5.9	
Other	874	4.8	821	4.3	921	4.7	892	4.5	782	4.8	754	4.3	
Vehicle - Pedestrian	951	5.0	909	4.8	822	4.2	878	4.4	440	2.7	438	2.5	
Vehicle - Bus - Minibus	204	1.1	192	1.0	210	1.1	210	1.1	188	1.0	190	1.1	
Vehicle - Truck	139	0.8	166	0.9	163	0.8	174	0.9	187	1.1	240	1.4	
Man Factor (Driver)	17575	97.6	18788	99.4	18546	99.0	18811	99.3	16222	99.7	17862	99.7	
Contributing factors	12	0.1	8	0.0	7	0.0	3	0.0	7	0.0	7	0.0	p=0.001
Pedestrian	12	0.1	8	0.0	7	0.0	3	0.0	7	0.0	7	0.0	
Technical vehicle condition	17	0.1	18	0.1	7	0.0	3	0.0	9	0.1	11	0.1	
Road conditions	14	0.1	9	0.0	6	0.0	0	0.0	3	0.0	4	0.0	p=0.001
Road infrastructure	332	1.8	351	1.9	179	0.9	3	0.0	4	0.0	2	0.0	
Climatic conditions	12218	68.0	12634	72.2	12743	64.8	14762	74.0	12889	79.9	14146	79.8	
Road superficial conditions	2586	14.4	2261	12.0	1932	9.8	1481	7.4	2827	17.3	2551	14.3	p=0.001
On	115	0.6	94	0.1	38	0.2	6	0.0	21	0.1	24	0.1	
Wet	660	3.7	437	2.3	1648	8.3	3000	1.6	240	1.5	403	2.3	
Slippery	191	1.1	209	1.1	448	2.3	126	0.6	66	0.4	281	1.6	
Other	2	0.0	10	0.1	0	0.0	3	0.0	3	0.0	3	0.0	
Climatic conditions	11865	66.1	13339	70.6	12690	64.3	14333	71.9	12279	75.3	13871	78.3	p=0.001
The Cloudy	1703	9.0	1184	6.3	1334	6.8	2046	10.3	1780	10.9	1309	7.4	
Rainy	1329	7.4	1368	7.2	915	4.6	1883	9.4	1443	8.9	920	5.2	
Wet snow	830	4.6	592	3.1	1864	9.4	479	2.4	380	2.3	891	5.0	
Fog	96	0.5	80	0.4	17	0.1	246	1.2	114	0.7	624	3.5	
Time	1188	6.6	1178	6.2	1268	6.4	1286	6.5	1037	6.4	1206	6.8	p=0.001
02:00-05:00	411	2.3	396	2.1	471	2.4	529	2.6	440	2.7	509	2.9	
05:00-10:00	2539	14.1	2626	13.9	2869	14.6	2767	13.9	2186	13.3	2411	13.6	
10:00-14:00	4999	27.6	5329	28.2	5561	28.0	5697	28.3	4942	27.5	4993	27.3	
14:00-18:00	8179	42.9	8000	42.1	8149	41.1	8290	41.9	8178	41.1	8496	42.6	
18:00-22:00	3385	18.0	3552	18.8	3649	18.5	3483	17.5	2945	18.1	3177	17.7	
Place of accident	4729	25.3	4217	22.2	4639	23.5	4988	24.9	3932	24.1	4408	24.6	p=0.001
National road	1482	8.3	1204	6.4	1409	7.1	1491	7.5	1321	8.1	1338	7.5	
Urban road	9788	54.4	10061	56.4	11392	57.7	11147	55.9	9201	56.4	9930	56.2	
Highway	0	0.0	0	0.0	0	0.0	0	0.0	248	1.5	187	0.9	
Rural	1781	9.7	1831	9.7	2012	10.2	2073	10.4	1278	7.8	1624	9.2	
Days	2879	15.0	2996	15.8	3238	16.4	3329	16.4	2501	15.3	2849	15.2	p=0.001
Monday	2701	15.0	2875	15.2	2796	14.2	2658	13.3	2496	15.1	2615	14.8	
Tuesday	2703	15.0	2642	14.0	2834	14.3	2999	14.9	2496	15.1	2396	14.6	
Wednesday	2515	14.0	2712	14.4	3002	15.2	2739	13.7	2360	14.5	2615	14.8	
Thursday	2872	14.8	2804	14.8	3029	15.3	2925	14.7	2481	15.2	2694	14.8	
Friday	2719	15.1	2778	14.7	2778	14.0	2969	14.9	2242	13.8	2394	13.5	
Saturday	1824	10.1	2084	11.0	2082	10.5	2079	10.4	1794	11.0	2023	11.4	

According to Health For All database, for SEE-countries for 2011, and Kosovo Police data for Kosovo, Kosovo has the highest number of road traffic accidents with injuries, 478.3 per 100 000 (Fig. 1).

Discussion

Road traffic accidents are among main epidemiologic problems and public health issues in developed and in developing countries. Road traffic accidents as a global challenge are on the global agenda through Sustainable Development

Goals SDG 3 and 11 which aim to half the number of global deaths and injuries from road traffic accidents by 2020 and provide access to safe, affordable, accessible and sustainable transport systems and improving road safety by 2030.

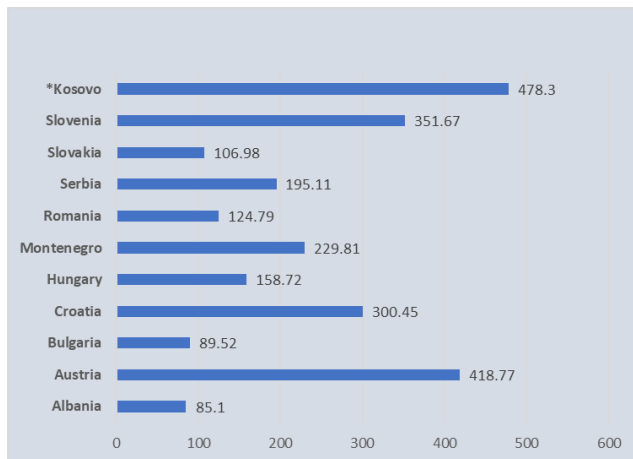


Figure 1: Road traffic accidents with injury per 100 000, SEE countries, 2011

Public health importance of road traffic accidents besides that are largely preventable, are also health consequences as death, disability, quality of life, economic burden with direct and indirect losses for the victims and their families.

It is estimated that every day in the world 3287 people dies in-car accidents [6]. According to the World Health Organization's Report-2015 on the situation of road safety, the traffic accident mortality rate in Italy is 6.1 per 100,000, Austria 5.4, France 5.1 less than Kosovo mortality rate 6.4 per 100,000 inhabitants, which is the smaller rate in comparison with Hungary and Serbia with 7.7 and Bulgaria 8.3 per 100 000 inhabitants. The highest mortality rate in the region is recorded in Bosnia and Hercegovina with 17.7 and Albania with 15.1 per 100,000 inhabitants. In Iran, road traffic accidents are the reason for 25% of unnatural deaths [4]. In Rumania injuries caused by road traffic accidents represent an important morbidity and mortality risk factor. The incidence of road traffic injuries was 30.61 for 100,000 inhabitants, whereas the mortality rate 10.28 deaths for 100,000 inhabitants [7].

In Kosovo for the period 2010-2015, on average yearly number of road traffic accidents is 18437, dead persons 138, injured 9135, mortality rate 7.4 per 100000 and lethality of 1.5%. In our study the most frequent age of fatal cases and victims in general in traffic crashes was over 19 years old that is in line with many other studies like one in Brazil [8], similarly mostly affected in road traffic accidents in Africa are young and especially young men. People in the 20-54 age group accounted for 71.8% of all those fatal cases annually [9]. The young population between ages of 20 and 34 is the age group mostly affected, and since is economically active,

consequences overcome a person with wider implication on economic losses of their families also [10].

Highest fatal cases according to their involvement in traffic, is among drivers. Regarding contributing factors, the driver is responsible on average of 99.3% for entire period 2010-2015 whereas climatic conditions only 0.5% and technical vehicle condition 0.1%. Similar results were found in different studies, in the United Arab Emirates, driving behaviour are more prevailing contributing factors, and vehicle safety is least [11]. In South Africa, most of the casualties of road traffic accidents were drivers (46%) [10]. In Taiwan, human factor respectively psychosocial influences are responsible up 3 to 4% of accidents [12]. In Lasi driver's error was identified as the main contributing factor in about two-thirds of all road traffic accidents [7].

In a report from Africa, more passengers were killed than any other road user in the years 2010-2012, accounting for 43.8% of all fatalities in 2010, 51.1% in 2011 and 43% in 2012 and the least affected road users are drivers, at 26.4%, 25.7% and 28.5% of all fatalities in 2010, 2011 and 2012 with the most prevalent death risk factors disregarding traffic rules (45%) and driver rushing (31%) [13]. While in Africa passengers are the most affected road users in crashes, in Kosovo mostly fatal cases are among drivers. In Peru, the majority of the fatalities were pedestrians (61%) [14], and in Basel similarly, for injuries, the majority of the fatalities (84.8%) occurred among pedestrians [15].

In Kosovo for the period 2010-2015, an accident with a vehicle is most frequent with about over 70% during the entire period, followed by vehicle to vehicle with average 8%. Similarly, in a study conducted in Iran, most collisions were vehicle-vehicle crashes 52.3% [16]. While in Kosovo over 50% of crashes occurred in the urban road, in Iran most fatal injuries (61.4%) occurred on outer-city roads and only 27.4% occurred on inner-city roads [16]. In Kosovo majority of accidents happen on Fridays and Saturdays similarly with other studies [9, 10, 14, 18, 19], while Sunday is the day with the lowest accident rate, similar with Peru [14].

In Kosovo most crashes occur in the afternoon rushing hours between 14.00-18.00hrs with 31.0%, similarly, with other studies, road traffic accidents occur mainly between two in the afternoon and eight at night [9, 10, 14], followed by 10.00-14.00 hrs with 27.9%. In Saudi Arabia, the most frequent time was during the rush period of noon to 3 pm [17], while in other studies during early evening hours [18, 19].

Among superficial road conditions in road traffic accidents, the dry road was recorded mostly with average 72.9%, mostly in clear weather with 71.1% similar to another study [17].

A large number of vehicles contribute to air pollution which has an impact on increasing burden of chronic respiratory diseases as asthma and emphysema. Policy interventions in many countries as in the example in Rumania have reduced road traffic crashes, in a short period [7]. Safety belts are shown to be helpful as road safety measures, since 1976 after enforcement of the law on safety belts, 31% less injured persons, four times fewer head injuries, three times less minor injuries and five times less severe injuries were found [15]. In Verona after low enforcement on the seat belt, a significant reduction of injured/accidents ratio was recorded 29%, head trauma for 50.3% [20]. In line with Decade of Action for Road Safety (2011–2020) aiming to stabilise and reducing the increasing trend of road traffic fatalities and saving an estimated 5 million lives over the period, in Kosovo several interventions were taken to maintain citizens' life and wellbeing. Road safety is associated with legal, institutional, technical and financial support with enforcement of new traffic Law no. 05 / L-088, with new rules for all participants in traffic to increase safety in road traffic, traffic flow and environmental protection [21].

For the period 2010-2015, there is a slight decrease in the mortality rate of 0.1‰ and lethality rate of 0.1% each year whereas there is an increase of 21.5‰ for traumatism rate for each year. A Higher number of fatal cases are drivers and above 19 years with more than 80%. Among injured significantly highest percentage is among passengers for all years and above 19 years old. Traffic accident with a vehicle is mostly too happened with approximately over 70%, mostly on dry road 72.9% and clear weather 71.1%. The driver is contributing factors of road traffic accidents on average 99.3% whereas climatic conditions only 0.5%, with over 50% of crashes occurred in urban road 56.2% mostly during Monday 16.00% and in the afternoon rushing hours between 14.00-18.00hrs with 31.0%. A joint effort from health, education and police sectors should compile a public health strategy and action plan to increase awareness and traffic culture focused on human risk factors.

In conclusion, there is a slight decrease in the mortality rate of 0.1‰ and lethality rate of 0.1% each year, whereas there is an increase of 21.5‰ for traumatism rate for each year. Limitation of the study was disaggregated data on excel database which was a barrier for depth calculation and analyse.

Acknowledgment

To the Statistics Department of the National Police of Kosovo for access to the information they collect.

References

1. WHO. Global status report on road safety 2015. Geneva, Switzerland, 2015. http://who.int/violence_injury_prevention/road_safety_status/2015/en
2. Jadaan KS. Road traffic accidents in Kuwait: an economic dimension. *Accid Anal Prev.* 1990;22(4):399-401. [https://doi.org/10.1016/0001-4575\(90\)90055-P](https://doi.org/10.1016/0001-4575(90)90055-P)
3. Connelly LB, Supangan R. The economic costs of road traffic crashes Australia, states and territories. *Accid Anal Prev.* 2006;38(6):1087-93. <https://doi.org/10.1016/j.aap.2006.04.015> PMID:16797462
4. García-Altés A, Pérez K. The economic cost of road traffic crashes in an urban setting. *Inj Prev.* 2007;13(1):65-8. <https://doi.org/10.1136/ip.2006.012732> PMID:17296693 PMID:PMC2610566
5. Hejazi R, Shamsudin MN, Radam A, Rahim KA, Ibrahim ZZ, Yazdani S. Estimation of traffic accident costs: a prompted model. *Int J Inj Contr Saf Promot.* 2013;20(2):152-7. <https://doi.org/10.1080/17457300.2012.720578> PMID:23025243
6. <http://asirt.org/initiatives/informing-road-users/road-safety-facts/road-crash-statistics>
7. Manole M, Duma O. The dynamics of risk factors in road traffic accidents in Iași county. *Rev Med Chir Soc Med Nat Iasi.* 2005;109(3):633-7. PMID:16607763
8. Al Marzooqi AH, Badi M, El Jack A. Road road traffic accidents in Dubai, 2002-2008. *Asia Pac J Public Health.* 2010;22(3 Suppl):31S-39S. <https://doi.org/10.1177/1010539510372834> PMID:20566531
9. Bakhtiyari M, Delpisheh A, Monfared AB, Kazemi-Galougahi MH, Mehmandar MR, Riahi M, Salehi M, Mansournia MA. The road traffic crashes as a neglected public health concern; an observational study of Iranian population. *Traffic Inj Prev.* 2015;16(1):36-41. <https://doi.org/10.1080/15389588.2014.898182> PMID:24761776
10. Olukoga A. Pattern of road traffic accidents in Durban municipality, South Africa. *West Afr J Med.* 2008;27(4):234-7. PMID:19469402
11. Hassan MN, Hawas YE, Maraqa MA. A holistic approach for assessing traffic safety in the United Arab Emirates. *Accid Anal Prev.* 2012;45:554-64. <https://doi.org/10.1016/j.aap.2011.09.009> PMID:22269542
12. Ding SL, Wang JD, Chen KT. Epidemiologic analysis of 845 cases of pedestrian traffic injuries. *Zhonghua Yi Xue za Zhi. Chinese Medical Journal Free China Ed.* 1994, 53 (6 Suppl B): 16-22.
13. Motor Vehicle Accident Fund. Annual Road Crash & Claims Report 2012.
14. Choquehuanca-Vilca V, Cárdenas-García F, Collazos-Carhuay J, Mendoza-Valladolid W. Epidemiological profile of road road traffic accidents in Peru, 2005-2009. *Rev Peru Med Exp Salud Publica.* 2010;27(2):162-9. <https://doi.org/10.1590/S1726-46342010000200002> PMID:21072466
15. Hell K. Injuries through road traffic accidents to car occupants with and without the obligation to wear safety belts. *Unfallchirurgie.* 1980;6(1):28-34. <https://doi.org/10.1007/BF02589447> PMID:7210261
16. Heydari ST, Hoseinzadeh A, Ghaffarpassand F, Hedjazi A, Zarenezhad M, Moafian G, Aghabeigi MR, Foroutan A, Sarikhani Y, Peymani P, Ahmadi SM, Joulaei H, Dehghankhalili M, Lankarani KB. Epidemiological characteristics of fatal road traffic accidents in Fars province, Iran: a community-based survey. *Public Health.* 2013;127(8):704-9. <https://doi.org/10.1016/j.puhe.2013.05.003>

PMid:23871394

17. Nofal FH, Saeed AA, Anokute CC. Aetiological factors contributing to road road traffic accidents in Riyadh City, Saudi Arabia. *J R Soc Health*. 1996;116(5):304-11.

<https://doi.org/10.1177/146642409611600508> PMid:8936950

18. Durić P, Miladinov-Mikov M. Epidemiological characteristics of road traffic injuries in AP Vojvodina. *Med Pregl*. 2009;62(1-2):17-22. <https://doi.org/10.2298/MPNS0902017D> PMid:19514595

19. Caixeta CR, Minamisava R, Oliveira LM, Brasil VV. Traffic injuries among youth in Goiania, Goias State. *Cien Saude Colet*.

2010;15(4):2075-84. <https://doi.org/10.1590/S1413-81232010000400021> PMid:20694329

20. Campello C, Preite G, Poli A, Zuppichini F, Marigo M. Effects of seat belt legislation on injuries of road traffic accidents. *Epidemiol Prev*. 1996;20(4):313-7. PMid:9044894

21. Kosovo Police Annual Report, 2013.

http://www.kosovopolice.com/repository/docs/raporti_anglisht_2013.pdf