

## Verification of reported chief complaints about the injuries in Tehran road accidents from pre-hospital emergency, year 2010-2011

Hamidreza, Khankeh<sup>1</sup>, Samaneh, Maleknia<sup>2</sup>

1. Associated Professor and Post-Doc in Emergency and Disaster Management, Nursing Department, University Of Social Welfare & Rehabilitation Sciences, Tehran, Iran, Department of clinical science and education, Karolinska Institute

2. Ms.c in Biostatistics, Tehran, health ministry, maleknias@gmail.com

### Abstract

**Introduction:** According to international statistics, road accidents in Iran are 20 times more than world's average. Because of the necessity of correct valuation of chief complaints in treatment services management and also considering this point that there is no survey about this subject on Iran till now, so this study has verified the valuation of chief complaints caused by traffic events in pre-hospital section of Tehran in years 89 and 90.

**Methods:** This is a cross-sectional study for survey of reported chief complaint about the injuries in Tehran road accidents from pre-hospital emergency, belongs to year 1389-90.

**Results:** Totally there is just %30 valid data for age and gender. Mean and standard deviation of age is 31.54 and 14.3. All valid data includes % 81.7 males and %18.3 females. Furthermore in all data there is just %1.5 valid recoded data for chief complaint. Trauma \_without consider to part of body\_ is the most chief complaint. Multiple traumas has mostly accompanied by nausea and bleeding, trauma to lower limbs by bleeding and movement disorder and trauma to head and neck ,beside the high rate of bleeding, has been associated with nausea and dizziness.

**Conclusion:** In general, the results indicate a significant effect of age, sex and place of emergency in the chief complaint. Complaints of Lethargy and then nausea are more associated to older people and also trauma to the upper limbs is more for people age 25 to 30 years. Men also suffer more severe than women. All those who have suffered amputation, internal bleeding and genitourinary damaging, have been male. In this way, all those who have been impaired consciousness before the accident, have been male. Trauma to the pelvis and complained of dizziness have occurred significantly in rural road accident.

**Keywords:** chief complaint, road accident, pre-hospital emergency system

### Introduction

According to World Health Organization (WHO) around 3500 people die in roads all around the world every day and around 50 million people become disabled or injured every year. The organization warns that road events are one of the main reasons of disability all around accidents are more than 500 billion \$ per year (1).

the world. Children, pedestrians, motorcyclists, and old people are among the most vulnerable road users and the people between 5-29 years old are the most numbers among the killed and injured ones in road accidents. Furthermore economically, the global cost for car

In case of comparison among different countries, this point is

important: although the countries with low and medium income, own less than 50% of recorded vehicles in all around the world, but 90% of road accidents fatality occur in improving countries. Road accidents in Iran also cause thousands of deaths and injuries per year and billions of dollars economical costs in this country. Road accidents in Iran are 20 times more than world's average and in this country the most reason of under 5 years old children's death is the road accident (2-4).

Despite of all mentioned points, road accidents are preventable. Many countries have gained a severe decrease in the number of accidents and their concluded injuries by paying attention to security and relief key matters. Emergency system service is sample of them. Many of the victims are those who die before arriving to hospitals, so improvement in emergency services in accident scene can increase the chance of being alive and prevent injuries and long term disabilities (5-7). For instance it is possible to prevent 35% of mortality in China, if the wounded person receives on time and effective treatment (8). Of course different studies and survey show that presenting perfect medical treatments in road accidents need special education and experience (9). The history of pre-hospital emergency institution in Iran is referred to year 1352 and crumbling the ceiling of Mehrabad Airport Waiting Room. In this painful event 16 people were killed and 11 people were injured. On that date, we had no organized system for helping and moving the injured people in such survey about this subject on Tehran and even Iran till now, so this study has verified the valuation of chief

accidental events. After that event our country's medical emergency system was instituted and Iran was known as the fourth country which had pre hospital emergency services all around the world (10). Various studies have been done about trauma pre hospital treatments and valuating the ways of giving services in driving accidents in Iran or last years (11-13). In this case, correct recognition of injured chief complaint would increase service quality. Related survey to correct recognition of chief complaint and reduction of mortality amount (14), related survey to determination of pre hospital treatment type according to chief complain (15) and also various studies about correct valuation of complaint and its relation with on time and right services (16-18), are some of these studies. Indeed some surveys declare chief complaint and proved recognition can improve the level of treatment supervising credit in emergency section (19).

As, in many cases, limited complaints contain big range of diseases and injuries, Some of the experts in personnel training, believe that there should be a logical balance between training about current complaints and rare but dangerous ones (20). In some articles, the same chief complains considering different levels of age and gender culminates in variant recognitions (21).

As there is a great volume of road accidents in Iran (2) and because of the importance of correct valuation about chief complaints in treatment services management and also considering this point that there is no complaints caused by traffic events in pre-hospital section of Tehran in years 89 and 90.

**Methods**

This study is done according to a determined object, by sectional-analytical method and by using recorded data in related missions in Tehran emergency area. In this study

census was used and so these data are the recorded information about related missions since 1.1.1389 to the last done mission on 31.04.1390. As it is observed in table 1, 103531 numbers have been inserted to analysis after the data mining.

Table 1: initial survey of data records

Type of data record	No.
The entire rows of related recorded data	106000
Missions false / incorrect address	535
Mission damage and no casualties	1666
No result recorded	268
The number of rows of data used in the analysis	<u>103531</u>

At first all the recorded chief complaints have been coded by experts. As regards, there can be recorded more than one chief complaint for each injured person, so there are maximum 2 complaints for each person. The order of these complaints is according to their order of caller expression (who is maybe injury) and recording by user in system. By this description, the first chief complaint is the first complaint which was mentioned by the caller and the second one is the last mentioned chief complaint. Of course 18 rows of data, around 0,001% of people have third chief

complaints which are ignored because of their rarity.

**Results**

Descriptive analysis on age and sex variables show that around 30% of these two inserted variables in observations are not registered. From the total number of observations is enrolled, 76391 data registered for Age variable, out of them is obtained mean 31.54 and SD 14.3. Number of 76391 ages are entered which mean 31,54 and standard deviation 14.3 have been gained of them. in sex variable 72088 rows are entered which 81.7% belong to men and 18.3% belong to women

Table 2.1 : descriptive statistic

Age			sex		
Statistic	Number	percentage	Statistic	number	percentage
The number of valid rows of recorded data	76391	73.8	The number of valid rows of recorded	72088	69.6
The number of rows of not recorded data	27140	26.2	The number of rows of not	31443	30.4
Mean	31.54		The number of male	58922	81.7
Median	28		The number of female	13166	18.3
Standard deviation	14.3				
Min	0				
Max	104				

Among all studied people, 1532 people have first valid chief complaint, 162 people have second valid chief complaint. These numbers show that only around 1.5% of registered data rows have a valid level of chief complaint variable.

According to this table 2.2, Trauma –without considering body part- has the most chief complaints with 726 numbers. After that Trauma to head and neck with 253 numbers is in the second place. Internal bleeding, superficial injury, and the mouth lock have the least numbers in chief complaints levels.

Table 2.2: distribute of first chief complaint

first chief complaint	Frequen cy	percenta ge	first chief complaint	frequen cy	percenta ge
Trauma	726	47.4	Convulsion	11	0.7
Trauma to the head and neck	253	16.5	Difficulty breathing	10	0.7
Trauma to the lower limb	203	13.3	Dizziness	8	0.5
Multiple trauma	72	4.7	Trauma to the pelvic	7	0.5
Trauma to the upper limb	50	3.3	Trauma to the abdomen	5	0.3
Trauma to the chest	33	2.2	Amputation	4	0.3
Trauma to back	28	1.8	Weakness	3	0.2
Trauma to face	27	1.8	Trauma to urogenital	2	0.1
Impaired consciousness after	27	1.8	Internal bleeding.	1	0.1
Lethargy	15	1	Superficial injury	1	0.1
Bleeding	16	1	Impairment of consciousness before the accident	2	0.1
Nausea	13	0.8	Movement Disorder	2	0.1
Fracture	12	0.8	Locking	1	0.1
			Total	1532	100

According to following table, bleeding and after that, breathe problem with 58 and 26 numbers are among the most secondary chief complaints. Nausea and dizziness are

also of chief complaints with high numbers.

Table 2.3: distribute of secondary chief complaint

secondary chief complaint	frequency	percentage	secondary chief complaint	frequency	percentage
Bleeding	58	35.8	Locking mouth	2	1.2
Difficulty breathing			Trauma to the lower limb	1	0.6
Nausea	26	16	Trauma to the upper limb	1	0.6
Dizziness	19	11.7	Trauma to the abdomen	1	0.6
Movement Disorder	17	10.5	Trauma to the head and neck	1	0.6
Lethargy	11	6.8	Trauma to face	1	0.6
Impaired consciousness after accident	8	4.9	Impairment of consciousness before the accident	1	0.6
Movement Disorder	6	3.7	Shocking	1	0.6
Trauma	3	1.9	Fracture	1	0.6
Amputation	2	1.2			
convulsion	2	1.2	Total	162	100

In table 2.4 which is crosstab table of the most numbers related to second chief complaints according to the levels of first chief complaints, high numbers of head and neck Trauma

with bleeding or dizziness are observed. Trauma to chest with breathing problem has 15 numbers which is also considered as high levels in the chart.

Table 2.4: crosstab of the most second chief complaints according to the levels of first chief complaints

		secondary chief complaint				
		Movement	Dizziness	Nausea	Bleeding	Difficulty
first chief complaint	Multiple trauma	1	1	4	3	0
	Trauma to the lower limb	3	0	0	10	0
second chief complaint	Trauma to the head and neck	3	12	11	30	1
	Trauma to the chest	0	0	1	0	15
	Trauma to face	0	0	1	9	0

In verification of other information related to injuries, such as Systolic pressure, Diastolic pressure, unfortunately there was no good data registration and the data are so weak to be analyzed. So these data are not trustable and we ignore analyzing them. In verification of correlation between variables with chief complaints, we use the correlation coefficients and different statistical

methods according to the types of variables. Variables such as sexuality, mission result, the type of accident (urban or road) and also the variable of chief complaint are all nominal variables and therefore the correlation coefficients of Phi and Cramer's V are used in their valuations. Table below shows the related results.

Table 2.5: The results of correlation tests of nominal variable to first chief complaint

	First chief complaint			
	correlation coefficients of Phi		correlation coefficients Cramer's V	
	value	Sig	value	Sig
Sexuality	0.23	0	0.23	0
Mission result	0.33	0.74	0.12	0.74
Type of accident	0.22	0.050	0.22	0.050

According to the results of table above, correlation of variables such as sexuality and accident type is significant in 0.95% level. The correlation of age variable which is

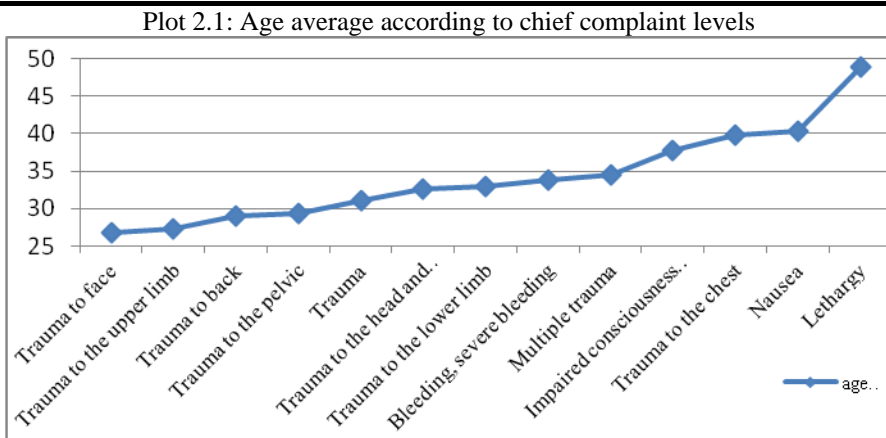
quantitative and continuous variable is calculated by one way Analysis of Variance. Table 6.2 shows the related results.

Table 2.5: The results of ANOVA in order to independency survey between age and first chief complaint

Age	Sum of Squares	df	Value F	Sig.
Between group	3746	5	3.5	0.004
Within group	223927	1036		
total	227676	1041		

Table above shows that in confidence interval of 99%, there is

a significant relation between age and first chief complaint.

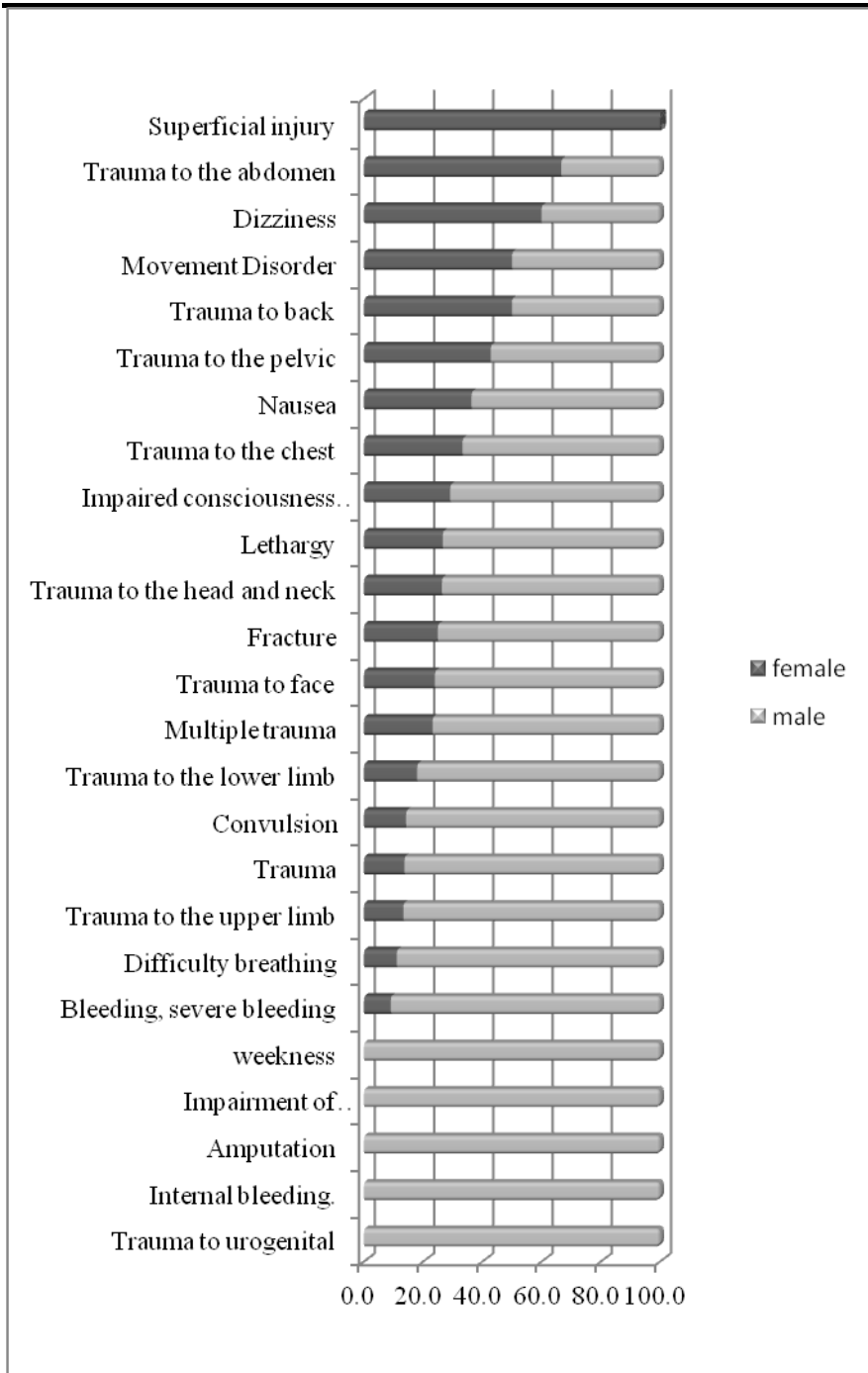


The results of plot 2.1 are showing Heterogeneous distribution of different ages in the levels of chief complaints. According to these results the relation of different age levels with chief complaints levels is

significant. As it is observed complaint about Lethargy is for elderly and the complaints about upper limb, face, head and neck are more related to young people.

Plot 2.2: percent of sexual distribution according to chief complaint levels



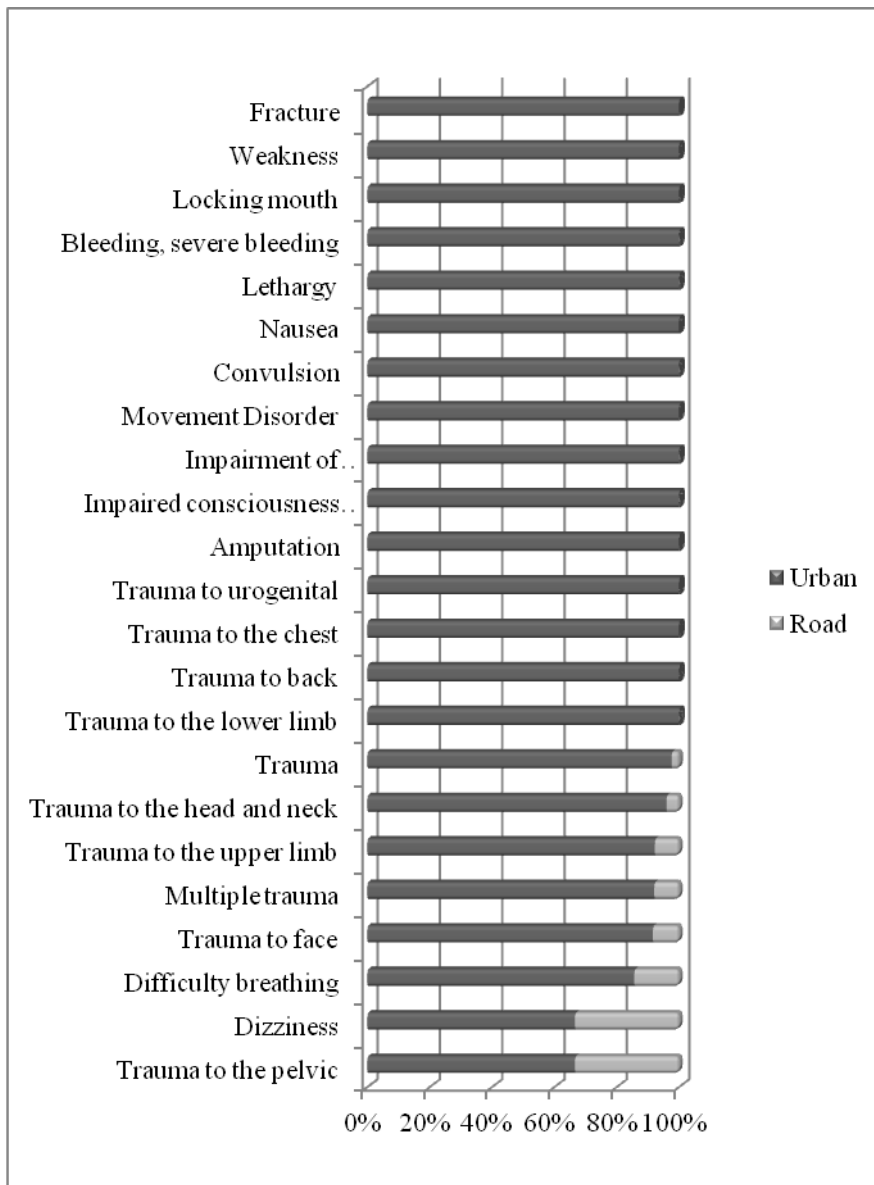


According to above plot which shows the percent of sexual

distribution in all levels of chief complaint, the men are more severe

suffered from injuries; the women are more suffered by superficial injury.

Plot 2.3: percent of accident's type distribution according to chief complaint levels



According to table above, urban and road accidents' ratio to the levels of Therefore trauma- without considering body part- has the most

first complaint, follows the total sequence of complaint in all data.

numbers in chief complaint 295 in city missions and 7 numbers in road missions.

Plot 2.3 shows that most of the recorded complaints are about city accidents. Although, only 5% of studied data are related to road missions, but it's observed that more than 30% of Trauma to pelvic and dizziness are related to these missions.

### **Conclusion**

As mentioned, the aim of this study is to verify reported chief complaints of injured people about Tehran's traffic accidents in pre-hospital emergency year 1389-1390. According to this research aim 103531 numbers of data entered to be analyzed. The results of descriptive analysis express that only around 30% of age and sex variables are valid and only 76391 valid numbers of total data are registered for age variable which the mean 31.54 and standard deviation 14.3 were gained of them. In sex variable we have 72088 registered rows which 81.7% of them belong to men and 18.3 % belong to women.

Among the total studied people, only 1.5 % of registered data have a valid level of chief complaint variable which 1532 people have the first chief complaint and 162 people have second complaint. According to results Trauma\_ without considering the body part\_ has the most chief complaint with 726 numbers. After that, Trauma to head and neck with 253 numbers is in the second place. Also it is showed that internal bleeding; superficial injury and mouth lock have the least numbers in the levels of chief complaints. Bleeding and after that, breathing problem with 58 and 26 numbers

have the most secondary chief complaint.

Simultaneity verifications of both complaints show that multiple Trauma is most with nausea and bleeding. In this way, after Trauma to lower limb, bleeding and movement disorders have been observed. These results are also acceptable clinically, because when some parts of body are under Trauma at the same time, the probability of bleeding or having a deep wound always exists. Severe Trauma to lower limb can also cause disorders in movements.

The other result of simultaneity verification of two complaints is that in Trauma to head and neck, in addition to a high level of bleeding, considerable numbers of nausea and dizziness were also observed which according to clinical effects of head Trauma, this result is generally natural. A high percent of those injured by chest Trauma have also suffered from breathing problem. The intensity of impact has caused these breathe problems. Another gained result is that Trauma to face causes bleeding, nausea and dizziness.

Corresponding studies to verify the chief complaint, present it as a very important point for injured person. For instance Chin and Kim, in a descriptive past reviewing study which used hospital data of 7 years in Saul, have verified chief complaints and related matters in different classes and estimated the number of mortality of each class (14). Also, Dickinson and his coworkers have valuated using a special medicine treatment for the patients with special chief complaint (15).

Pre hospital therapeutic protocols have also a special look to chief

complaint and its importance of helping the patient in all the levels of injury. Andrew Key Marsden has also mentioned in his article that the right base of sending ambulances by dispatch is related to right and correct received information from the patient's chief complaint (17). This point is such important that Noble Mathews has mentioned in his book "components of Trauma tendency" that how we can care the patient in the best way, even before ambulance arrive according to the types of chief complaints(18). Actually exact verification of chief complaint followed by correct recognition can have a great role in decreasing the mortality measure.

Fleischauer and his coworkers, who consider emergency section as the basic part of syndromic supervision system in general health organizations, mention that recognitions of this section in addition to chief complaint can increase the validity of therapeutic supervision (19). In another article Babl and his coworkers in addition to mentioned point above, have also emphasized on this point that there should be a logical balance between training about current complaints and rare but dangerous complaints (20).

Verification of effective variables on chief complaints, using related test, show that sex, age and accident type variables have a significant effect on declared chief complaints by patients.

The relation between age levels and chief complaints may be cause of fewer attentions among young people. According to results, the complaints of Lethargy and after that nausea are related to older people. According to previous discussion

and the direct relation of these two types of complaints, their happenings in a special age group are also notable. This shows that the people aged 25-30 are more suffered by trauma to upper limb and face. This may be cause of this age group's using motorcycles without using helmet and safety belt while driving. This result has also been confirmed by more accurate internal prospective studies (22).

According to these research findings, chief complaints in men and women are significant and men are injured more severe than women. All the people who were hurt by amputation, internal bleeding and genitourinary hurts, were male. Of course about the high ratio of men's presence in each level of chief complaints, we should consider high percent of their presence in the streets, with cars, motor cycles or even walking. Therefore it is suggested that a common research project with traffic organization is done to gain statistics about the presence measure of each sex in the streets and roads. The findings also show that all the people who had impaired of consciousness before the accident were male. As international statistics about drug using show that men are more than women in this matter (13), so, it may cause related chief complaints.

Verifications show that no study has verified chief complaints of traffic events injured people in pre hospital section. in traffic events some limited chief complaints, can cover many of the injuries. The relation of chief complaint with age and sex variables is also significant in this study which this point has been also confirmed in Kennedy and his coworkers' article and they believe that different levels of these variables , cause different

recognitions and various uses of protocols(21).

About the effect of accident's type which contains urban and road levels, Trauma to pelvic and complaint about dizziness are significantly registered in road missions.

Generally, the results of this study contain significant effect of age, sex and mission's type in registered chief complaints. These results also show severe weakness of information registration system about traffic events in pre hospital emergency which should be reviewed and corrected. Therefore points below are suggested to more accurate and usable studies:

1- According to the type of emergency in traffic events which in

most of them witnesses have contacted 115 and the injured person was not able to contact himself, it is suggested that the main part of chief complaint will be filled by control and wireless [800] experts.

2- As some of the basic important information is owned by some other organizations such as police, traffic office and forensics, it can be better to do the researches and studies with the Cooperation of these organizations.

3- According to significant effect of mission type, it is recommended to do similar studies with more complete information of more road bases and missions.

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