

# Magnitude and Factors Associated with Road Traffic Accident among Traumatized Patients in Arba Minch General hospital, 2017

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## Abstract

**Introduction:** RTAs are among the leading causes of death and injury worldwide, causing an estimated 1.2 million deaths and 50 million injuries each year (World Health Organization (WHO), 2004). Ethiopia has the highest rate of RTAs, owing to the fact that road transport is the major transportation system in the country. However; it is often possible to minimize injury and crash consequences by providing better information about specific factors associated with RTA. Like other hospitals of Ethiopia, AMH is faced with the problem of traumatized patients.

**Objective:** To assess the magnitude and factors associated with road traffic accident related trauma among traumatized patients in Arba Minch Hospital, 2017.

**Method:** Institutional based cross sectional study was carried out among trauma victims presenting to Arba Minch hospital from May 10 to June 10. Totally 238 trauma victims were interviewed. Data was entered and analyzed using SPSS version 20 software. Binary logistic regression analysis was used to see the association between dependent and independent variables.

**Results:** A total of 238 trauma victims were included in the study. Of all interviewed trauma victims, 162 (68.1%) were male and 76(31.9%) were female. The mean age of the victims was 25.5. The highest numbers of victims (33.6%) were aged between 20-29 years and followed by age 10-19 years (21.8%). The victim' sex, age, occupation were significantly associated with RTA in a bivariate analysis.

**Conclusion and Recommendations:** The magnitude of trauma caused by road traffic accident was the highest cause of trauma (47%). Road traffic accident victims were predominantly males and people aged 20-49 years. The majority of them are from urban areas. Of all road traffic accidents, motor vehicle crash was the primary causes of injury. Passengers and pedestrians were the most commonly affected victims. We recommend Arba Minch transport authority to give more attention for those motor cycle drivers as most of the trauma were due to motorcycle.

**Keywords:** Road traffic Accident; Motor vehicle crash; Arba Minch

## Introduction

Road Traffic Accident (RTA) can be defined as an accident that occurs on a way or street open to public traffic, resulting in one or more persons being killed or injured, and involving at least one moving vehicle [1].

The costs of fatalities and injuries due to road traffic accidents (RTAs) have a great impact on societal well-being and socioeconomic development. RTAs are among the leading causes of death and injury worldwide, causing an estimated 1.2 million deaths and 50 million injuries each. The number of people who die in road traffic accidents is shocking, and ignorance could be the cause of these deaths.

Globally as well as in developing world, RTA are among the major social and health problems. The costs of fatalities and injuries due to road traffic accidents (RTAs) have a great impact on societal well-being and socioeconomic development. The largest proportion of serious injuries in Ethiopia comes from road traffic accidents; they have become one of the major national health burdens.

The majorities of the crashes occur during daytime hours, involve males, and involve persons in the 18-50 age groups [2]. However, it is often possible to minimize injury and crash consequences by providing better information about specific factors associated with RTA. Like other hospitals of Ethiopia, AMH is faced with the problem of traumatized patients. It has become imperative, therefore, to get some answers to the questions as why RTA is a common problem. The purpose of the study was essentially, to assess the magnitude and associated factors of RTA related trauma among traumatized patients in AMH.

## Objectives

### General objective

To assess the magnitude of RTA and its associated factors among traumatized patients in AMH, 2017.

### Specific objectives

- To determine the magnitude of RTA in the study area
- To identify associated factors of RTA

## Methods

### Study area and period

AMH was located at Arba Minch town, the capital city of GamoGofa zone, which is 505 Km form Addis Ababa (capital city of Ethiopia) and 280 Km from Hawasa, center of southern nation's nationality and

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people regional state (SNNPRS). Arba Minch has two sub cities, Secha and Sikela. The hospital is located at Secha which is the administrative center of Arba Minch town.

AMH is technically a regional hospital; it is acting as a referral hospital and provides services like preventive, curative and rehabilitative care for 100,000-200,000 people per year [3].

The study was conducted from May 10-June 10, 2017

### Study design

Institutional based Cross-sectional study was conducted

### Source population

The source populations for this study was all traumatized patients in AMH

### Study population

The study populations were traumatized patients in AMH during data collection period.

### Study unit

Individual

### Eligibility criteria

- Inclusion criteria- Victims who was present during data collection in EOPD and surgical ward.
- Exclusion criteria- Victim who was severely ill with no surrogate care giver.

### Sample size determination

We used single population proportion formula with the assumption of 95% interval and the margin of error 5%.

$$n = Z^2 p (1-p) / d^2 = (1.96)^2 (0.62 \times 0.5) / (0.05)^2 = 362$$

Where: P= the prevalence of RTA related traumatized patients, d =the marginal error 5%.

Z  $\alpha/2$  = critical value at 95% confidence interval (1.96).

Adding non response rate (10%) the calculated sample size will be 398

We use population reduction formula (the above sample was to be taken from a relatively small population)

$$n = \frac{n_0}{\left(1 + \frac{n_0}{N}\right)}$$

$$= 398 / 1 + 398 / 600 = 238$$

Where n=the calculated sample size,  $n_0$  =initial sample size

N=estimated number of traumatized patients with in one month i.e. 600

So the final sample size was 238

### Sampling procedure

Systemic sampling technique was used to select 238 patients with trauma who fulfill inclusion criteria during the study period using  $K^{\text{th}}$  interval. The first patient will be selected by lottery method and followed by every other patient.

$$K = \frac{600}{238} = 2$$

Where, 600=number of traumatized patients in 1 month

238=calculated sample size

### Variables

#### Dependent variable

RTA coded as 1=yes, 0=no

#### Independent variable

- Age
- Sex
- Address
- Educational status
- Marital status
- Weather condition
- Type of road
- Vehicle type
- Patient role
- Substance use
- Seat belt status
- Mobile phone use

### Operational definitions

**Road traffic accident:** An accident occurs when vehicles collide with other vehicles, with pedestrian and with other stationary obstacles.

**Substance users:** Substance users are individuals who use alcohol, chat or cigarette.

**Mobile phones use:** A person who uses mobile phone while driving.

### Data collection procedure

We used primary source of data through interview with individual victims while they arrived at AMH for care and those who are admitted.

Data was collected through direct interview in hospital. Two data collection facilitators were selected and orientation was given for them 1 day before the actual data collection on the objectives, relevance of the study, and confidentiality of the information.

A total of 238 trauma patients were interviewed. Where the victims were not able to answer the question because of his/her condition surrogate information was obtained from a helper or anybody who brought him/her to hospital.

### Data quality control

Orientation was given to data collectors before the actual data collection. Interview questions were revised, edited, and those found to be unclear was modified. Pretest was done in Mirab abaya health center by 20 questionnaires.

### Data processing and analysis

The collected Data by using interview was coded, entered and

cleaned for its completeness and errors, and then analysis was done using SPSS version 20 statistical software packages. Variables were explained by frequency tables, graphs and summary statistics. Bivariate and multivariable logistic regression were done. Strength of association was presented using odds ratio and 95% confidence intervals.

### Ethical consideration

Letter of permission and cooperation was taken from the department of public health, college of Medicine and Health Sciences, Arba Minch University and it was given to AMH. Information on the study was given to the participants, including purposes and procedures, potential risk and benefits, So that, they provide accurate and honest response. It was explained that participation is voluntary and that private information will be protected. In order to protect the confidentiality of the information, names were not included in interview questions.

### Dissemination of the result

Report of the research finding was given to Arba Minch University College of medicine and health science, department of public health, road traffic authority.

### Results

#### Socio-demographic characteristics

A total of 238 trauma victims were included in the study. Of all victims visited the hospitals 162 (68.1%) were male and 76 (31.9%) were female. The mean age of the victims was 25.5. The highest numbers of victims (33.6%) were aged between 20-29 years followed by age 10-19 years (21.8%). RTAs presenting to hospital more commonly occurred in urban areas; in contrast non road traffic accident was the highest on clients from rural areas (Table 1).

#### Magnitude of injury

RTAs were the leading cause of injury, accounting for 112 (47.0%) of all trauma victims followed by personal violence 51 (21.4%) and falling accident 43 (18.1%) (Figure 1).

#### Vehicle type that caused road traffic accident and Patient's role at the time of injury

Among 112 road traffic accidents, 45 (40%) were due to motor cycle crash followed by 37 (33%) due to Bajaj related accident and 13(11.6%)

due to public bus. Out of 112 victims of road traffic injury, 46 (41%) were passengers, 34 (30%) were drivers, 28 (25 %) were pedestrians (Table 2).

#### Driver's behavioral factors

Among 34 driver victims only 14(respond that they wear seatbelt while driving. Otherwise most of them (27) were not using mobile phone and only 9 of them use substance while driving.

#### Variable association

The victim's sex, age, occupation were significantly associated with RTA in a bivariate analysis. In addition day and whether condition of trauma were also significantly associated with RTA. So according to the analysis males are 18.16 times high risk for RTA [COR=18.16 (7.83-42.13)]. The age groups 0-9 have 93% less risk for RTA than the age group above 60 [COR=0.071(0.008-0.663)] (Table 3).

### Discussion

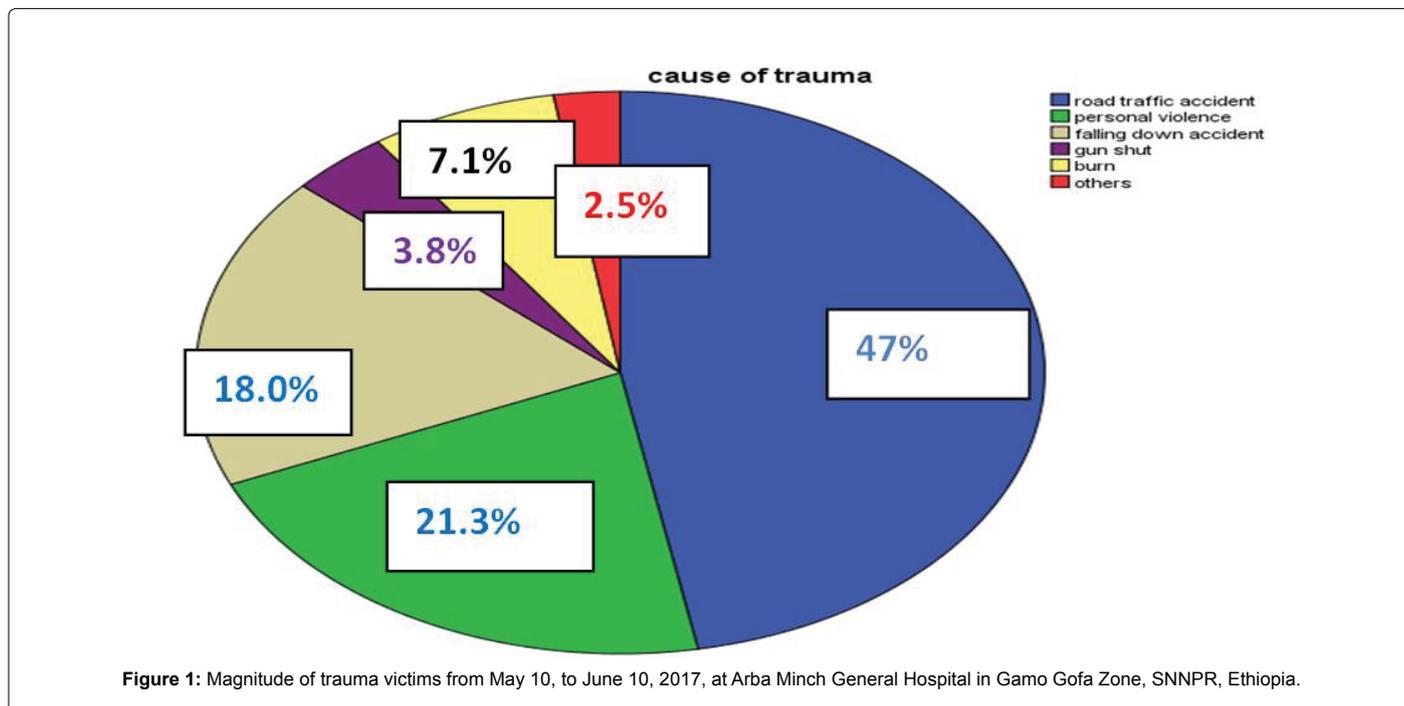
In this study it is found that RTAs are the most common cause of traumatic injury (47%), followed by personal violence and falling accidents. Studies conducted in Tikur Anbessa Hospital, Addis Ababa [3] and in North Gondar zone [4] reported road traffic accident at the top with different trend, but followed by interpersonal violence and falling accidents respectively. Magnitude of RTA in study conducted in wolyata zone was 62% which is higher than our study.

The current study revealed that 80 (33.6%) of the victims were in age group between 20-29 years which is consistent with other similar studies [3-5]. This shows that a large amount of sufferers are people of most economically active age group that subsequently leads an economic lost both to the family and the nation. The results of this study also found that males were much more likely to suffer from injuries than females. This is likely due to the nature of work exposing, majority of males on urban streets or the increased level of participation in high-risk activities among male individuals.

In line with other studies [6,7] majority of RTA victims were passengers, 46(41%) followed by driver 34(30%), but in another studies it was reported that pedestrians were majority of cases and followed by passengers [8-10]. The predominance of traumatic injury by passenger may be related with greater use of public transport by general population, risky driving behavior and the driving skill of their

Variable	Road traffic accident		Non-road traffic accident		Total		
	Frequency	%	frequency	%	frequency	%	
Sex	Male	105	44.1	57	23.9	162	68
	Female	7	2.9	69	28.9	76	32
	Total	112	47.0	127	52.9	238	100
Age	0-9	2	0.8	28	11.7	30	12.6
	10-19	28	11.7	24	10.1	52	21.8
	20-29	62	26.0	18	7.5	80	33.6
	30-39	12	5	27	11.3	39	16.3
	40-49	3	1.2	21	8.8	24	10.1
	50-59	2	0.8	5	2.1	7	2.9
	≥ 60	3	1.2	3	1.2	6	2.5
	Total	112	47.1	127	52.9	238	100
Address	Urban	74	31.0	84	35.2	158	66.3
	Rural	38	15.9	42	17.6	80	33.7
	Total	112	47.0	127	52.9	238	100

Table 1: Socio-demographic characteristics of trauma victims at Arba Minch General Hospital from May 10 to June 10 Southern Ethiopia, 2017.



	Variable	Frequency	Percent
Vehicle type	Isuzu	6	5.3
	Bajaj	37	33
	Motor cycle	45	40
	Minibus	5	4.4
	Public bus	13	11.6
	Others*	6	5.3
	Total	112	100
Patient role	Driver	34	30
	Assistant driver	4	3.5
	Passenger	46	41
	Pedestrian	28	25
	Total	112	100
Type of road	Coble stone	31	27.6
	Asphalt	64	57.1
	Pista	9	8.0
	Others**	8	7.1
	Total	112	100

Others\*: cart and lorry , Others\*\*: muddy and dusty roads

**Table 2:** Vehicle type that caused RTA, role of trauma victims and type of road at the time of injury from May 10, to June 10, 2017, at Arba Minch General Hospital in Gamo Gofa Zone, SNNPR, Ethiopia.

Variables		RTA		COR (95% CI)	AOR(95% CI)	P Value
		Yes	No			
Sex	Male	105	57	18.16 (7.83 -42.13)	20.731(4.088-105.134)	0.001
	Female	7	69	1	1	
Whether condition	Cloudy	21	9	0.292(0.79-1.070)	0.065(0.007-0.590)	0.015
	Sunny	59	113	0.065(0.22-0.193)	0.031(0.005-0.20)	0.001
	Rainy	32	4	1		

**Table 3:** Factors associated with RTA among traumatized patients in at Arba Minch General Hospital in Gamo Gofa Zone, SNNPR, Ethiopia, 2017.

operators. A study in Kenya also showed that 85% of the collision were caused by human factors (drivers and pedestrians error.) High speed

and failure to give priority cause five times more fatal collision than following, supplementing the existing literature [11]. In this study the

second most common of traumatized injury was on drivers these may be related to the possibility that most of them are owners and drivers of motor cycle and Bajaj so they are at the 1<sup>st</sup> line to be the victim.

It was found that motorcycles were responsible for the majority of road traffic crashes that is consistent with the study conducted on motorcycle injuries as an emerging public health problem in Mwanza City, north-western Tanzania [12]. In contrast, it is lower than the study conducted on injury characteristics and outcome of road traffic crash victims at Buganda Medical Centre in Northwestern Tanzania [13]. In this study motorcycles are the major cause of trauma followed by Bajaj, the reason for this could be, the presence of many motor cycle than other type of vehicle in Arba Minch town and people use them as regular public transportation.

Peace and Maunder [14] included whether among external factors that influence road traffic accidents especially during rainy season in Zimbabwe which is consistent with our finding. This may be due to drivers view may be obscured by rainy whether condition while driving.

## Conclusion

The incidence of trauma caused by RTA was the highest cause of trauma (47%). RTA victims were predominantly males and people aged 20-29 years. The majority of them are from urban areas. Patients from rural areas more commonly presented with non-RTA trauma. Of all RTAs motor vehicle crash was the primary causes of injury. Passengers and pedestrians were the most commonly affected victims.

## Recommendations

- We recommend Arba Minch town transport authority to give more attention for those motor cycle drivers as most of the trauma were due to motorcycles.
- Further research should be conducted in order to explore the risk factors that hinder and/or aggravate the frequency of RTAs in the community.

## Limitation of the study

Survival bias-we missed those victims who dead.

AMH is in urban area, so it will underestimate those non RTA cause in rural areas.

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## Authors' Contribution

**AM, FA, MY, MG, MY, Sa A and So A:** Initiated the research, wrote the research proposal, conducted the research, did data entry and analysis.

**DM:** Contributed in the designing of methods, write up and analysis and wrote the manuscript

**AT:** Contributed in the designing of methods, write up and analysis

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