

## **Detecting the Prevalence and Determinants of RTA at DURH's Surgical Emergency OPD in Ethiopia: A Qualitative Study**

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### **Abstract**

According to the World Study on Road Traffic Accident Prevention, an estimated 1.2 million people die and 50 million are injured in road traffic accidents each year around the world. The aim of this study is to determine the prevalence and determinants of RTA at DURH, Dilla's Surgical Emergency OPD. From December 1 to January 15, 2009E.C., a cross-sectional hospital-based prospective analysis was performed. Epi info version 3.5.1 was used to enter the data, which was then moved to SPSS version 16 for further review. The report included a total of 403 trauma casualties, with 190 (47.1%) of them being caused by road traffic collisions. Aside from that, raising awareness about safety rules among young adult males, students, and businesspeople is critical in order to reduce the number of road traffic accidents and their serious consequences.

**Keywords:** *Road Traffic Accident, Trauma, Accident casualties etc.*

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## **Introduction**

A big but under-appreciated public health problem is road traffic accidents. According to the World Study on Road Traffic Accident Prevention, an estimated 1.2 million people die and 50 million are injured in road traffic accidents each year around the world (WHO 2009). According to current and expected motorization patterns, the issue of RTAs will worsen, resulting in a global public health crisis. Accordingly, by 2020, road accidents are predicted to be the third leading cause of death, after HIV/AIDS and tuberculosis (Peden, Scurfield, Sleet 2004).

The global road traffic fatality rate is 18 per 100 000 people, with middle-income countries having the highest annual fatality rates, at 20.1 per 100 000 people (WHO 2013). Motorcyclists (23 percent), pedestrians (22 percent), and cyclists (5 percent) –also known as “vulnerable road users”– account for half of all road traffic fatalities worldwide, with car occupants accounting for 31 percent and unidentified road users accounting for the remaining 19 percent (WHO 2013). [Odero, Garner, Zwi 1997] Motor vehicle deaths are the leading cause of death in teenagers and young adults worldwide. Middle-income nations, which account for 72 percent of the world's population, account for 80% of road traffic deaths.

Because of the large number of vulnerable road users, poor transportation conditions such as the lack of seat belts, overcrowding, and dangerous vehicle environments, the severity of road traffic accidents in Africa is likely to be much higher than anywhere else. The lack of a reliable monitoring system has also obscured the scope of the issue in Africa. Car crashes in Africa have the worst outcomes due to a shortage of pre-hospital and hospital emergency services (Lagarde 2007). According to a study conducted in Tanzania, students and businessmen make up the majority of road traffic accident victims, with limb and head injuries being the most common forms of injuries suffered, predisposing victims to prolonged hospitalisation and mortality (Chalya, Mabula, Dass 2012).

## **Research problem**

Before the automobile, there was a problem with road traffic injuries. Nonetheless, the car, followed by trucks, buses, and other vehicles, was the source of rapid escalation in the misery. A rider is said to have caused the first traffic accident on May 30, 1896 in New York City, which was followed a few months later by the first fatality, a pedestrian in London (Gibson 1975; Joseph 1980).

## **Significance of the Study**

The importance of defining RTA characteristics, recognizing and evaluating RTA characteristics, patterns, magnitude, determinants, and effect in the town will be emphasized. Despite the fact that the study is confined to a single town in the region, the findings may be useful in launching research into the complex issues of urban road transport in general and RTA in particular. The study's findings will also be useful in gaining important data and knowledge about RTA features, determinants, and impediments.

### **Objectives**

- The general aim was to determine the prevalence and determinants of RTA at DURH's Surgical Emergency OPD in Dilla, Ethiopia, in 2009 E.C.
- To assess the severity of RTA at DURH's Surgical Emergency OPD in Dilla, Ethiopia, in 2009 E.C.
- To determine factors that contribute to RTA at DURH's Surgical Emergency OPD in Dilla, Ethiopia, in 2009 E.C.
- Surgical Emergency OPD of DURH, Dilla, Ethiopia, 2009 E.C. To assess the outcome of RTA victims at DURH's Surgical Emergency OPD, Dilla, Ethiopia, 2009 E.C.

### **Methods**

The research was carried out in DURH, Dilla town in southern Ethiopia. Dilla town is one of the two city administrations in the Gedio district, and it was established in 1904 E.C. It is located 365 kilometres from Addis Ababa and has one main road that runs through it from Addis Ababa to Moyale and 90 kilometres from Hawassa (the capital city of SNNPR of Ethiopia). It has a climatic condition of Woynadega and is situated at an altitude of 1300-3000 metres above sea level. It receives between 1200 and 1800 mm of rain per year on average.

Sidama is to the north, Wonago is to the south, Bule and Oromia are to the east, and Oromia regional state is to the west. The town has a total area of 135 square kilometres and a population of 102,624 people, with 50,286 males (48.9%) and 52,338 females (51.1%). The Gedio ethnic group is the most dominant ethnic group in Dilla city, followed by others, and the majority of the people speak the Gediogna language. Protestantism is the most common religious belief in the town, followed by Orthodox, Muslim, and other faiths.

Trading, microeconomic enterprises such as cobblestone building, coffee processing industries, flour processing plant, and pottery work are the town's key sources of income. Six governmental and nine private banks, five insurance companies, and eight microfinance enterprises operate in the town, all of which contribute to the people's economic growth. There is one referral hospital, two health centers, nine private clinics, three pharmacies, and nine drug stores in the area, as well as clean pipe water, one university, one private college, two

preparatory and three high schools, 27 elementary and junior schools, postal, hydroelectric power, and telecommunication services.

### Study design and period

The prevalence and determinants of RTA among victims at DURH's surgical emergency OPD were investigated in a prospective hospital-based cross-sectional study. From September to June 2009 E.C., the research was carried out.

### Sample size and sampling techniques

Sample size was computed based on the formula for single population proportion.

$$n = \frac{Z^2 P (1-P)}{d^2}$$

The value of p was estimated to be 50.0 percent because the prevalence of RTA among research subjects had not been determined in previous studies. With a 95 percent confidence interval of 1.96 and a d of 5% (n=sample size, p=proportion, d=tolerable margin of sampling error), a z-value of 1.96 was used.

$$\text{Hence; } n = \frac{(1.96)^2 \times 0.5 (1-0.5)}{(0.05)^2}$$

$$n = 384$$

*With adjustment for non-response (5% contingency), the final sample size for exit interview was:  $384 + 0.05(384)$ ; which equals to 403.*

As a result, primary data was gathered from 403 trauma patients of all genders and ages who visited DURH's surgical Emergency OPD.

The data was obtained from the study participants between December 1 and January 15, 2009E.C, until the sample size was reached.

Data analysis:

Epi-info Version 3.5.1 was used to clean the data, which was then analyzed in SPSS Version 16. The frequency of RTAs was investigated using descriptive statistics. The relationship between RTA and selected socio-demographic characteristics was investigated using binary logistic regression. For multivariable analyses, all variables with a p-value of 0.2 in bivariate analysis were held. P0.05 was used to determine statistical significance for adjusted odds ratios (AOR) and 95 percent confidence intervals (CI). RTA was investigated for linear patterns using Chi-square checks.

Variables	Frequency	Percent
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### Variables & Operational definitions

#### Dependent variables

The dependent variables will be the prevalence of RTA, and the severity of RTA.

### **Independent variables**

- Age, sex, educational status, driving experience, type of car, type of accident, level of driver's license, RTA causes, light conditions, and weather conditions at the time of the collision were the independent variables.
- Fatal accident- at least one person (driver, passenger, or pedestrian) died as a result of injuries sustained as a result of an RTA within 30 days.
- At least one person was seriously injured and taken to the hospital, but no one died.
- Slight injury—at least one person needed medical attention, but there were no deaths or accidents that necessitated hospitalization.
- Both crashes that did not result in injuries or deaths are classified as property damage.

### **The results:**

The study's findings were sent to DU's Department of Public Health and the Dilla town road and transportation office in order to remind them of the study's findings, which will be helpful in improving the programme. The results of the study were also presented to those who were interested, with the possibility of publication.

### **Results:**

The report involved a total of 403 trauma patients. Road traffic injuries accounted for 190 (47.1%) of all victims who visited the hospital. The most victims of RTAs (70(36.8% )) were between the ages of 16 and 25, followed by those under the age of 16 (40(21.1 percent )) and those between the ages of 26 and 35 (36(18.9% )). Gedio was the most common ethnicity in the sample population (126 (66.3 percent), followed by Amahara (16.84 percent) and Oromo (13.68 percent). Protestants made up the majority of RTA victims (130 (68.4%), followed by orthodox Christians (32 (16.8%).

When it came to the educational status of road traffic accident victims, 72 (37.9%) and 23 (12.1%) had completed primary and secondary school, respectively, while 7 (3.7%) had completed a higher level of education. Students made up the bulk of the road traffic victims (57 percent), followed by farmers (40 percent), merchants (28 percent), and regular laborer's (26 percent). Dilla town accounted for 85 (44.7 percent) of the 190 road traffic incidents that occurred during the study period, while Y/cheffe (15.3 percent), Wonago (7.9%), Chuko (1.6 percent), and others (30.5 percent) accounted for the remaining 105 (55.3 percent).

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<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>
<b>Sex</b>		
Male	147	77.4
Female	43	22.6
Total	190	100.0
<b>Age</b>		
Less than 16 years	40	21.1
16-25 years	70	36.8
26-35 years	36	18.9
36-45 years	20	10.5
46-55 years	8	4.2
56 years and above	16	8.4
Total	190	100.0
<b>Ethnicity</b>		
Gedio	126	66.3
Amahara	16	8.4
Tigray	1	.5
Oromo	13	6.8
Others	34	17.9
Total	190	100.0
<b>Religion</b>		
Orthodox	32	16.8
Muslim	16	8.4
Protestant	130	68.4
Others	12	6.3
Total	190	100.0
<b>Address</b>		
Dilla	85	44.7
Wonago	15	7.9
Chuko	3	1.6
Y/cheffe	29	15.3
others	58	30.5
Total	190	100.0
<b>Marital status</b>		
Single	112	58.9
Married	69	36.3
Divorced	5	2.6
Widowed	4	2.1
Total	190	100.0
<b>Level of education</b>		
Cannot read & write	33	17.4
Can read & write	55	28.9
Primary school	72	37.9

Secondary school	23	12.1
Higher education	7	3.7
Total	190	100.0
<b>Occupational status</b>		
Daily laborer	26	13.7
Student/trainee	57	30.0
Gov't employer	8	4.2
Driver	8	4.2
Merchant	28	14.7
Farmer	40	21.1
Others	23	12.1
Total	190	100.0

Table 1 Socio-demographic characteristics of victims of RTAs from January 1- February 30, 2009.E.C. at Surgical Emergency OPD of DURH, Gedio Zone, Southern Ethiopia.

RTAs were the most common cause of injury, accounting for 190 (47.1%) of all trauma casualties, followed by dropping accidents, which accounted for 77 (19.1%), and fighting/personal abuse, which accounted for 70. (17.1 percent). In terms of the pre-hospital process, the vast majority of the patients, 181 (95.1%), were taken to hospitals within 24 hours of their injuries. Table 2 shows the results.

<b>Causes of injury&amp; duration of Hospital stay</b>		
Variable category	Frequency	Percent
RTA	190	47.1
Falling accident	77	19.1
Fighting/personal violence	70	17.1
Burn	16	4
Others	50	12.4

Total	190	100
<b>Duration of pre-hospital phase</b>		
<b>Variable category</b>	<b>Frequency</b>	<b>Percent</b>
Less than 24 hours	181	95.3
24 hours to one week	6	3.2
One week to two weeks	2	1.1
Three weeks to a month	1	0.5
Total	190	100

Table 2 Causes of injury and duration of pre-hospital phases among trauma victims from January 1-February 30, 2009 E.C.at Surgical Emergency OPD of DURH, Gedio zone, Southern Ethiopia

The type of vehicle that caused the accident and the position of the victims at the time of injury

Among the 190 road traffic incidents, 158 (83.2%) were caused by a motorcycle accident, followed by 9 (4.7%) caused by an Isuzu accident, and 7 (3.7%) caused by a Bajaj accident. 60 (31.6%) of the 190 victims of road traffic injuries were pedestrians, 59 (31.1%) were passengers, and 30 (30.0%) were drivers. Out of the 57 drivers involved in the RTA, 24 (42.1%) did not have a valid driver's license at the time of the accident, and 18 (31.6%) were under the influence of drugs or alcohol while driving. See Table 3 for more information.

<b>Vehicle type that caused RTA</b>		
<b>Vehicle type</b>	<b>Frequency</b>	<b>Percent</b>
Isuzu	9	4.7
Motor cycle	158	83.2
Public bus	4	2.1
Minibus	1	0.5
Bajaj	7	3.7
Others	11	5.8
Total	190	100
<b>Victim's role at the time of RTA</b>		
<b>Role</b>	<b>Frequency</b>	<b>Percent</b>
Pedestrian	60	31.6
Passenger	59	31.1
Driver	57	30.0
Assistant driver	9	4.7
Others	5	2.6
Total	190	100

Table 3 Vehicle types that caused road traffic accident and victims' role at the time of road



traffic injury from January 1-February 30, 2009 E.C.at Surgical Emergency OPD of DURH, Gedio zone, Southern Ethiopia.

Victims of RTAs' perceptions of the causes and the types of protection measures they are aware of

Out of 190 RTA victims, 59 (31.1%) believed that drug abuse/reckless driving was the cause of the crash, while 42 (22.1%) believed that RTA was caused by two or more behavioral causes. In terms of awareness of protection steps, 138 (72.6%) of RTA victims are aware of one or more of them, while the remaining 52 (26.4%) are unaware of any. Table 4 shows the results.

<b>Perceived causes of RTA</b>		
<b>Perceived causes</b>	<b>Frequency</b>	<b>Percent</b>
poor observation/inattention	30	15.8
substance use/speed/reckless driving	59	31.1
poor training/no license	5	2.6
driver's inexperience	4	2.1
pediastrian's fault	7	3.7
poor road safety	11	5.8
Two or more options	42	22.1
Others	32	16.8
Total	190	100.0
<b>Safety measures known by the victims</b>		
<b>Safety measures</b>	<b>Frequency</b>	<b>Percent</b>
not driving while drunk/drugged	8	4.2
wearing protective clothes	15	7.9
not over speeding	1	.5
Others	3	1.6
Missing	48	25.5
Two or more response	115	60.5

Table 4 Perceived causes & type of safety measures known by victims of RTA from January 1-February 30, 2009 E.C.at Surgical Emergency OPD of DURH, Gedio zone, Southern Ethiopia.

Pre-hospital treatment and the types of roads where the accident occurred

The majority of RTA incidents, 74 percent (38.9%), occurred on asphalt roads, followed by 66 percent on concrete roads (34.7 percent). In terms of pre-hospital treatment, 105 of the victims (55.3 percent) did not receive it. Table 5 shows the results.

<b>Types of roads in which the incident occurred</b>			
<b>Type of the road</b>		<b>Frequency</b>	<b>Percent</b>
Asphalt road		77	40.5
Piston road		66	34.7
Others		47	24.7
Total		190	100.0
<b>Pre-hospital care</b>			
Pre-hospital care		Frequency	Percent
	Yes	83	43.7
	No	105	55.3
	Don't know	2	1.1
	Total	190	100.0

Table 5 Type of road in which the incident occurred& Pre-hospital care from January 1-February 30, 2009 E.C.at Surgical Emergency OPD of DURH, Gedio zone, Southern Ethiopia

#### Victims of RTA injuries and their outcomes

Soft tissue injuries were observed in the majority of RTA patients (114 percent), followed by fractures (39 percent) and head injuries (32 percent) (16.8 percent). 159 (83.7%) of 190 road traffic accident patients survived without long-term disability at discharge, 18(9.5%) were referred, 7(3.7%) survived with long-term disability at discharge, and 6(3.2%) died. Table 6 shows the results.

<b>Type of injury suffered by the victim</b>		
Type of injury	Frequency	Percent
Soft tissue injury	114	60
Fracture	39	20.5
Head in jury	32	16.8
Others	5	2.6
Total	190	100
<b>The outcome of victims of RTA</b>		
Variable	Frequency	Percent
Died	6	3.2
Survived with long term disability	7	3.7
Survived without long term disability	159	83.7
Referred	18	9.5
Total	190	100.0

Table 6 The type of injury & outcome of the victims of RTA from January 1-February 30, 2009

E.C.at Surgical Emergency OPD of DURH, Gedio zone, Southern Ethiopia.

RTA and bivariate analysis of selected socio-demographic characteristics

Selected socio-demographic characteristics and RTA were subjected to bivariate analysis. As a result, there was a statistically significant relationship between male sex and RTA (p-value=0.000). In comparison to female respondents, male respondents had a higher risk of getting RTA [OR-2.18, 95 percent CI (0.409, 3.380)]. Table 7 shows the results.

<b>Variables</b>		<b>RTA N=19 0</b>	<b>Non- RTA N=213</b>	<b>P-value</b>	<b>COR (95% CI)</b>
Level of the education	cannot read & write	33	37	Ref.	Ref.
	Can read & write	55	62	0.986	1.005(0.555,1.820)
	Primary school	72	81	0.991	1.003(0.569, 1.768)
	Secondary school	23	26	0.982	1.008(0.485, 2.095)
	Higher education	7	7	0.845	0.892(0.283, 2.811)
Sex	Female	43	83	Ref.	
	male	147	130	P<0.000	2.1831(0.409,3.380)
Age	Less than 16 yrs	40	45	Ref.	Ref.
	16-25 yrs	70	79	0.991	1.003(0.588, 1.711)
	26-35 yrs	36	42	0.908	1.037(0.560, 1.920)
	36-45 yrs	20	22	0.953	0.978(0.466, 2.050)
	46-55 yrs	8	9	1.000	1.000(0.352, 2.838)
	56 yrs& above	16	15	0.777	0.889(0.394, 2.005)
Occupation	Daily laborer	26	29	Ref.	Ref.
	Student/trainee	57	64	0.984	0.993(0.525, 1.881)
	Gov't employee	8	9	0.997	1.002(0.362, 2.770)
	Driver	8	9	0.997	1.002(0.362, 2.770)
	Merchant	28	31	0.965	0.986(0.529, 1.839)
	Farmer	40	71	0.088	1.581(0.933, 2.677)
	Others	23	0	0.998	0.000

Table 7 Bivariate analysis b/n selected socio-demographics &RTA from January 1-February 30, 2009 E.C.at Surgical Emergency OPD of DURH, Dilla, southern Ethiopia, 2009 E.C.

## DISCUSSION

RTA is the most common cause of traumatic injury, accompanied by falling accidents and personal violence/fighting, according to this report. This research is similar to that done in hospitals in the Wolayita region (Feleke, Mohammed, Wondemagegn 2015). Road traffic accidents ranked first in studies conducted at TikurAnbessa Hospital in Addis Ababa (Taye, Munie 2003) and in North Gondar zone (Osman, Kebede, anberbir 2003), but were followed by interpersonal abuse and falling accidents.

The majority of road traffic accident victims in this study were young (16-25 years old) and in their most fertile and active years. This is also similar to a research performed at Addis Ababa's TikurAnbesa Hospital (Mohammed, Aklilu, Fikre, Engida 2015). The reproductive and productive age group represents the economically active age group, and the reason for their high rate of road traffic crashes may be due to their high levels of economic activity and participation in high-risk activities such as reckless driving/riding, over-speeding, driving/riding while under the influence of alcohol or drugs, and driving/riding without any protective mechanisms.

The male dominance found in this study is consistent with previous findings from wolayita zone (Feleke, Mohammed, Wondemagegn 2015) and TikurAnbesa Hospital in Addis Ababa (Feleke, Mohammed, Wondemagegn 2015). (Mohammed, Aklilu, Fikre, Engida 2015). The study's male predominance may be due to their increased regular movement for work and increased involvement in high-risk activities. The fact that they are also the most economically productive age group has serious economic consequences, especially at the family level, and necessitates an immediate response from government policymakers.

According to the findings, students/trainees made up the bulk of road traffic casualties (30%), accompanied by farmers, merchants, and daily laborer's. This indicates that students/trainees were injured as a result of this group's haste to get to school through heavy traffic. Students are frequently involved in road traffic accidents as they travel to and from school through heavy traffic, while farmers, merchants, and daily laborer's are frequently involved while carrying out their daily activities, which require movement from one location to another in order to conduct business.

According to a recent survey, pedestrians made up the bulk of traumatic victims (31.6%), followed by travellers (31.1 percent). This is in line with the findings of a study conducted at a Nigerian tertiary hospital (Akinpelu OV, Oladele AO, Amusa YB, Ogundipe OK, Adeolu AA, Komolafe EO 2007), but a study conducted at hospitals in the Wolayita region (Feleke,

Mohammed, Wondemagegn 2015) found that passengers were the majority of cases, followed by pedestrians. The high prevalence of pedestrian injuries in this study could indicate a lack of public awareness about road usage, a lack of pedestrian facilities in road design, and inadequate implementation of road safety measures by the general public.

Despite the fact that pre-hospital trauma treatment has been stated to be the most significant factor in deciding the ultimate outcome of an injury (Chalya PL, Mabula JB, Dass RM, Mbelenge N, Ngayomela IH, Chandika AB 2012), only 43.7 percent of road traffic accident victims received pre-hospital care. Prehospital treatment is also lagging behind, according to a study conducted at TikurAnbessa Hospital in Addis Ababa (Mohammed, Aklilu, Fikre, Engida 2015). Since the majority of those who die do so before reaching a hospital, this necessitates good access to pre-hospital care and a fast transportation system to the hospital in order to save lives.

According to the latest report, the majority of victims (83.7%) lived without long-term disability, 3.7 percent survived with disability, and 3.2 percent died. The mortality rates in Wolayita zone (Feleke, Mohammed, Wondemagegn 2015) and Northwestern Tanzania (Chalya PL, Mabula JB, Dass RM, Mbelenge N, Ngayomela IH, Chandika AB 2012) were 7.4% and 17.5 percent, respectively. The low mortality rate observed in this study may be due to the limited sample size (190 road traffic accident victims) at DURH's surgical OPD in Dilla, southern Ethiopia, compared to 230 road traffic accident victims at hospitals in the Wolayita region.

In this analysis, there was a statistically significant ( $p$ -value 0.001) connection between male sex and road traffic accidents. Males had a 2.18 times higher risk of being involved in a car accident than females. This high risk of RTA in males may be explained by more regular use of motor cycles by males in the study area, as well as more male participation in risky activities.

#### Limitations:

The results of this study may not be generalizable to other hospitals outside of Dilla since it was limited to only Dilla University Referral Hospital in Dilla, Ethiopia. The study's other drawback is its limited sample size, which can make correlations between dependent and independent variables impossible to detect.

#### Conclusion:

RTA was found to be the leading cause of trauma, with a prevalence of 47.3 percent. Males between the ages of 16 and 25 were the majority of RTA casualties. RTA has been found to be

the most common victim of students and trainees. The majority of road traffic accidents were caused by motorcycles. The primary cause of injuries in all RTAs was a motor vehicle accident. The victims who were most frequently affected were pedestrians and passengers. The bulk of the patients went to the hospital within 24 hours of their injuries. Just 3.2 percent of RTA patients died, but 3.7 percent suffered long-term disabilities as a result of their injuries. There was a statistically significant connection between becoming a man and being involved in traffic accidents.

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