



# Factors Associated with Road Traffic Accidents Involving Motorcyclists in Mwea Town, Kirinyaga County, Kenya

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## Summary

### INTRODUCTION

Motorcycle injuries constitute a major but neglected emerging public health problem in developing countries and are a common cause of road traffic injuries. This study was carried out to determine factors associated with road traffic accidents involving motorcyclists in Mwea town, Kirinyaga County.

### METHODOLOGY

A cross sectional descriptive study design was used. The instrument of data collection was a semi-structured interviewer administered questionnaire. Data was analyzed using *SPSS version 20*. A total of 180 commercial motorcyclists participated.

A total of 68 (38%) had been involved in road traffic accidents in the past one year at the time of the survey. Forty-seven (69.1%) of them had accidents once. Among those who were involved in accidents in the last one year, 18 (26.5%) attributed the occurrence of accident to poor visibility of the road, 16 (23.5%) to over speeding, 9 (13.2%) to careless motorists, and 6 (8.8%) to potholes.

### CONCLUSION

The extend of accidents was higher among those who drink alcohol, 34 (69.4%), than among those who don't, 34(26.0%) (P= 0.00). Majority of the accidents, 43 (63.2%) occurred as a result of rolling after losing control. Excessive speed and alcohol use were identified as major factors. Lack of helmet use among those involved in accidents was 41.2% which should be of concern to the authority to ensure that proper education and awareness is disseminated

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### INTRODUCTION

The great growth rate of motorcycle has come with its own challenges. Motorcycles pose interesting challenges in developing countries that are not faced by the rest of world [1].

In the last fifteen years the numbers of motorcycles per capita in many developing nations has doubled [2]. Studies indicate that motorcycles tend to operate at average speeds 10 kph faster than autos using



the same streets and roadways in a congested setting [1]. Motorcycle users are vulnerable on the road and represent an important group to target for reducing road traffic injuries [3].

The problem is increasing at a fast rate in developing countries due to rapid motorization and other factors [4].

Even in developed countries with low morbidity and mortality rates from motorcycle injuries, the risk of dying from a motorcycle crash is 20 times higher than from a motor vehicle crash (*Peden, 2004*); [3].

The African region has the highest road fatality rates globally (**24.1 deaths per 100,000 population**), well above the global average of 18.0 deaths per 100,000, in spite of the fact that the region is the least motorized with 2% of the world's vehicles.

Kenya has an estimated road fatality rate of 20.9 per 100,000 population, higher than that of the European region (**10.3 per 100,000 population**) [5].

Motorcycles registered rose from 2084 units in 2003 to 16293 in 2007 then to 125,058 units in 2013[6]. Majority of the urban and peri-urban poor have embraced this mode of transport as a household solution to their livelihoods.

According to the government of Kenya report of 2009, Motorcyclists have surpassed matatu drivers as the road users responsible for a majority of the accidents [7].

The statistics by traffic department further shows that, in June 2009, 180 motorcycles were primarily responsible for road accidents compared to 148 matatus.

In 2010, according to the Kenya Traffic Police Department, a total of 3055 road traffic deaths were reported by the Kenya Traffic Police and approximately 7% of these, were motorcyclists [8].

A cross sectional survey of road crashes involving commercial motorcycle tax(Boda Boda) drivers in Thika, found alarmingly high crash and injury rates. among drivers of commercial motorcycle taxis (locally known as "**boda-bodas**"): 38%

Of the 528 drivers interviewed had crashed in

the preceding three months alone, and of these, 62% had sustained a bodily injury [9].

The study aimed to establish factors associated with road traffic accidents involving motorcyclists and recommend ways of addressing them in order to curb the fatal road carnage that is being experienced on the Kenyan roads.

## Methodology

The study was carried out in Mwea Town in Kirinyaga County, Kenya.

This was a cross sectional descriptive study. There were approximately 13 groups of motorcycle operators operating in Mwea town on different motorcycle stages. A total number of registered motorcycles was 486. The registered 13 groups were treated as clusters in the sampling procedure.

Proportionate sampling technique was used. The number of participants from each sub-group was determined by their number relative to the entire population.

The selected sample was then selected from each cluster by simple random sampling technique, using table of random numbers

## Data collection

Data collection was carried out using a structured interview administered by interviewer. The data obtained was entered manually, then was entered into the computer and analyzed using the Statistical Package for the Social Sciences (*SPSS*).

Frequencies were generated and the *Chi-square test* was used to compare different proportions and test associations.

## RESULTS

A total of 180 motorcyclists were interviewed and 112 motorcyclists had no accident, but 68 were involved in accidents.

**Table 4.1:** History and attributed causes of accident next page Pg 76.



**Table 4.1: History And Attributed Causes Of Accident**

Involved in accident last one year	Number No.	Percenteges %
Yes	68	(37.8)
No	112	(62.2)
<b>Frequency</b>		
Once	47	(69.1)
Twice	17	(25.0)
More than twice	4	(5.9)
<b>Attributed causes of accidents (n=68)</b>		
Over speeding	16	23.5
Brake failure	1	1.5
Pot holes	6	8.8
Slippery roads due to wetness	3	4.4
Loose road chips	4	5.9
Poor visibility	18	26.5
Poor road markings	3	4.4
Careless motorists	9	13.2
<b>Others</b>	28	41.2

A total of 68 (38%) had been involved in road traffic accidents in the past one year at the time of the survey.

Forty-seven (69.1%) of them had accidents once in the year prior to the study. Among those who were involved in accidents in the last one year, 2018 (26.5%) attributed the occurrence of accident to:

- Poor visibility of the road, 16 (23.5%)
- Over speeding, 9 (13.2%)
- Careless motorists, 6 (8.8%)
- Potholes, 4(5.9%)
- Loose road chips, 3(4.4%)
- Slippery wet road, 3(4.4%)
- Poor road markings, 1(1.5%)
- Brake failure and 28(41.2%)

Other reasons which included an oncoming rider, a stationary animals mostly donkey on the road and pedestrians crossing the road.

The incidence of accident was higher among those who drink alcohol, 34 (69.4%), than among those who do not drink, 34(26.0%) (P= 0.00).

There was higher extend of accidents among those who used alcohol during working hours, 21(87.5%) than among those who did not use alcohol, 13 (52.0%) (P=0.012).

Those who smoked cigarettes accounted for only 16.9% of all the riders interviewed.



**Table 4.2:** Smoking, Alcohol And Other Drug Use Among Motorcyclists In Mwea

	No Accident	Accident	Total (n)
<b>Use of alcohol</b>			
Yes	15 (30.6)	34(69.4)	49
No	97 (74.0)	34(26.0)	131
<b>When alcohol used</b>			
During work	3 (12.5)	21(87.5)	24
After work	12 (48.0)	13(52.0)	25
<b>History of smoking</b>			
Yes	16 (61.5)	10(38.5)	26
No	96 (62.3)	58(37.7)	154
<b>How many times/day</b>			
1 to 5 times	6 (54.5)	5 (45.5)	11
6 to 10 times	6 (85.7)	1 (14.3)	7
16 to 20 times	0 (0)	2 (100)	2
A lot of times	1 (100)	0 (0)	1
Unspecified	3 (75)	1 (25)	4
<b>Smoking while working</b>			
Yes	6 (85.7)	1 (14.3)	7
No	9 (60)	6 (40)	15
<b>Use of other drugs</b>			
None	100 (64.1)	56(35.9)	156
Other drug	14 (58.3)	10(41.7)	24
<b>Use of drugs these while working?</b>			
Yes	5 (50)	5 (50)	10
No	4 (66.7)	2 (33.3)	6



Majority of the accidents 47 (69.1%) occurred during the day as compared to 21(30.9%) which occurred during the night. Other 43 (63.2) of the accidents occurred as a result of rolling after losing control

Whereas, 25 (36.8%) happened as a result of collision. Among those who collided, the objects of collision were motor vehicle, 11 (44%) motorcycle, 8(32%), and animal, 6(24%).

Most injuries were treated in the outpatient department which accounted for 50(73.5%) of those involved in accident, the hospitalized one accounted for 17.6% while 8.8% were not treated.

Injuries sustained included: bruises, 39(58.2%), broken bones (fractures), 7(10.4%), cuts 6(9%), burns 2(3%), dislocation 1(1.5%) and others 3(4.5).

Majority of the respondents who had been involved in accidents in the last one year had used helmet, 40(58.8%) as compared to 28(41.2%) who were not using helmet at the time of the accident.

The reasons for not wearing helmet among those involved in accidents were as follow: the majority,9(32.1%) claimed they forgot, followed by 6(21.4%) who said they did not have the helmet , those who ignored accounted for 14.3% while 7.1% said they did not see the need to use the helmet.

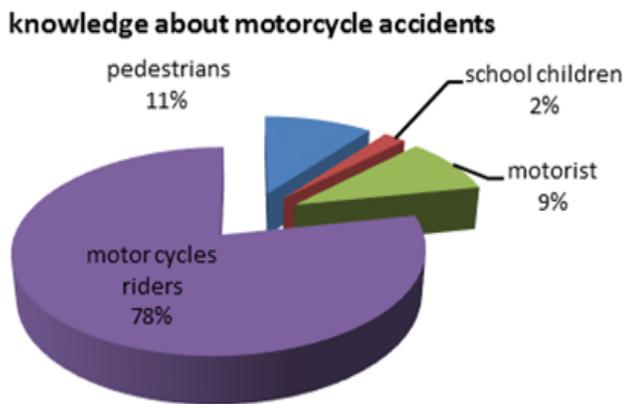
**Table 4.3: Nature and characteristics of motorcycle accidents**

Time of accident	n	%
Daytime	47	69.1
Night time	21	30.9
Nature of accident		
Rolling after losing Control	43	63.2
Collision	25	36.8
Object of collision		
Motorcycle	14	34.1
Vehicle/car	17	41.5
Stationary object	1	2.4
Pedestrian	1	2.4
Animal	6	14.6
others	2	4.9

Condition of road		
Good tarmac	48	70.6
Tarmac with potholes	4	5.9
Rough road	14	20.6
Slippery road	2	2.9
Where injuries treated		
Outpatient	50	73.5
Hospitalized	12	17.6
Not treated	6	8.8
Number of passengers		
One	17	25
Two	3	4.4
None	48	70.6
Where passengers treated		
Outpatient	18	26.5
Hospitalized	2	2.9
Not treated	2	2.9
No passenger	46	67.6
Injuries sustained		
Bruises	39	58.2
Had cuts	6	9
Burnt	2	3
Broken bones	7	10.4
Others	3	4.5
Not hurt	9	13.4
Dislocation	1	1.5
Use of helmet at the time of accident		
Yes	40	58.8
No	28	41.2
Reason not using helmet		
Forgot	9	32.1
Ignored	4	14.3
Don't have	6	21.4
Don't see need	2	7.1
Others	7	25

The major modifiable risk factors associated with motorcycle injuries were found to be alcohol use (OR = 1.93, 95%CI: 0.85–4.41). The odds of getting involved in motorcycle accident did not significantly change by smoking cigarettes (OR=1.02, 95%CI: 0.44-2.41) but slightly increased with the use of other drugs (OR=1.24, 95%CI: 0.52-2.97).

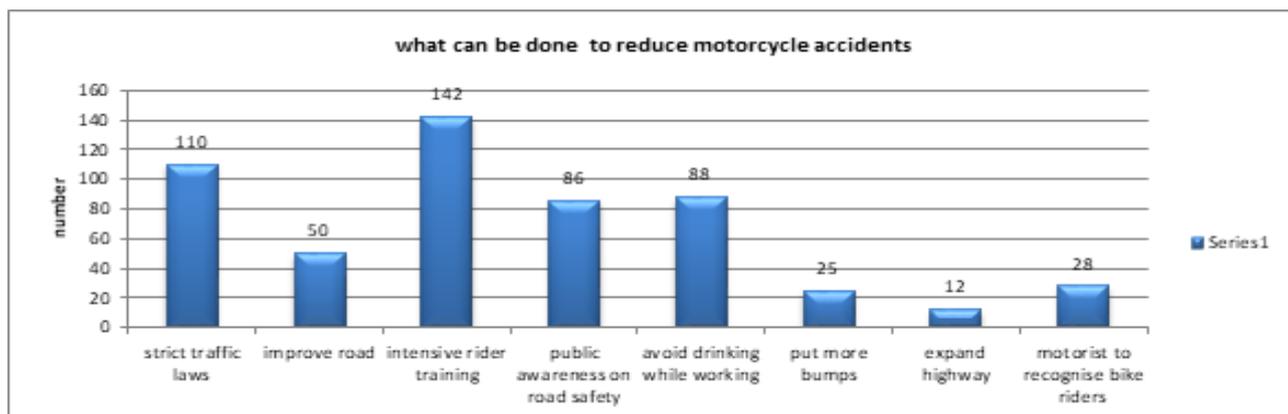
On the knowledge about motorcycle accidents, majority of the respondents felt that the main victims of road traffic accidents were: Motorcycle riders themselves, pedestrian, motorist and children as presented in the diagram below.



**Figure 4.1:** Knowledge about motorcycle accidents

Figure 4.2 below present different opinion of respondents on what can be done to reduce motorcycle accidents. Majority identified intensive rider training followed by strict traffic laws to curb accidents, avoiding drink driving and public awareness on road safety among others.

**Figure 4.2:**Opinion On Ways Of Reducing Motorcycle Accidents



The respondents’ opinion on the use of helmets was as follows: prevention of head injuries (142), prevents cold wind (114), prevents dust and insects from entering eyes (81), and avoid riders from getting hurt (17)

## DISCUSSION

Road traffic injuries are an important cause of morbidity and mortality worldwide, especially in low and middle-income countries and are currently ranked 9th globally among the leading causes of disease burden. The object of collision was mainly motor vehicles using the same road as the riders. This was consistent with similar studies done in Nigeria where collision with motor vehicles accounted for 47.1% of accidents and 36% [10, 11].

Injuries in the form of bruises, cuts and broken bones and being the commonest form of injury recorded during motorcycle crashes in this study was similar to findings reported in some other studies.

A study done in Singapore reported that wounds, fractures and/or dislocations of the limbs were significantly more common among motorcyclists in emergency departments compared with other motor vehicular incidents [12].

In a study done at Obafemi Awolowo Teaching Hospital, Ile Ife, Nigeria among victims of motorcycle accident, 79.3% of them had limb injuries [13]. Some studies have however reported head injury as the most frequently occurring injury among motorcyclists.

A study done in Thika, Kenya reported head and neck being the most common region of the body injured among the victims followed by the lower extremity [5].



Inadquate helmet use has been recorded in several studies, especially in developing countries. In this study, helmet use among those involved in the accident was 58.8%. This is higher compared to previous studies done in other part of the world.

In the study done in Ikot Ekpene, Southern Nigeria, helmet use was less than 10% among the motorcyclists [10].

In a study among motorcyclists in Ondo, Nigeria, only 0.5% used helmets and up to a third of them had never seen the crash helmet before (14).

In Benin City, Nigeria two studies reported that all motorcyclists and their passengers did not use helmets [15, 16].

On the contrary, an in-depth study of motorcycle accidents carried out in London showed that 80% of the motorcyclists wore helmets [17].

A Greek study identifies several reasons for low helmet use amongst motorcycle riders like peer pressure, lack of appropriate information, high cost and lack of convenience, disturbance of hearing and vision, or messing up of hair [18].

These differences in the rate of helmet use reflect divergence in awareness of the role of helmet in preventing or reducing the severity of head injury during motorcycle accidents between these countries and poor enforcement of traffic laws.

Even though less percentage were not using helmet, this is a number which should be of concern to the authority to ensure that proper education and awareness is done to improve on helmet use while riding motorcycles.

Excessive speed and alcohol use were identified as factors which contributed to the rate of occurrence of accidents among the motorcyclists in this study. Alcohol does impair rider's judgment and control of the motorcycle and this will increase the risk of getting involved in accidents.

Similarly excessive speed would lead to poor control of the motorcycle by the rider. Similar findings were recorded in a study among motorcyclists in Karu,

Nigeria where reckless driving accounted for 78% of the accidents while alcohol and drug intoxication accounted for 66% and 46%, respectively [19].

## CONCLUSION

In this study, 41.2% were not using helmet, which should concern the authority to ensure proper education and awareness is done to improve on helmet use.

Motorcycle injuries constitute a major but neglected emerging public health problem. There is need for enforcement against speed and alcohol consumption among motorcyclists during riding hours by government in order to reduce RTAs.

## Competing interests

The authors declare no competing interest

## Authors' contributions

All the authors listed in this article made contributions during the design of the study, data collection and interpretation, provided critique for intellectual content and gave final approval of the version submitted.

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