

# Helmet usage among motorcycle riders in Ghana

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## Abstract

The wearing of helmets is one way of preventing head injury and the practice is low in developing countries. This paper presents helmet use among Ghanaian motorcycle riders. Data was collected through observation of 21,108 motorcycle riders and questionnaires were administered to 1,182 motorcycle riders selected randomly. The results indicated that most of the motorcycle riders were carrying passengers and both of them were not wearing helmets. Youths (16-35 years) were the majority of the riders and were aware

## 1. Introduction

Motorcycles are one of the main means of transportation worldwide and may be used for sports such as racing. The use of it in

helmet offers protection against head injury but normally wear it to get by with the police and in some cases, to avoid being fined on the spot. The use of motorcycle taxis is also found to be creeping into the country and need strong legislation. In all, the use of helmets among Ghanaian motorcycle riders was very low and requires education to eradicate some form of perceptions (barriers) which are preventing its use, as well as strengthening its enforcement on regular basis.

## Keywords:

Accident, Ghana, Helmet, Motorcycle recent times has been associated with numerous road accidents. Studies show that in developing countries motorcycle injuries continue to be a considerable public health challenge [7], [17]. For instance the

proportion of all traffic fatalities sustained by motorcyclists increased significantly from 7.5% in 1987 to 18.9% in 2001 [25], [27] in China. According to [12] more than 1600 motorcycle riders die in traffic accidents each year in Taiwan with more than 65% of these deaths caused by head and neck injuries. One way of protecting the riders and passengers from head and face injuries, in the event of an accident, is the use of helmets. There is a lot of documentation on the safety benefits of helmets usage when riding motorcycles which includes a reduction in the number of recorded deaths, shorter period of hospitalisation and a reduction in the medical costs incurred by riders [14], [15], [5].

Mandatory helmet legislation is one way of protecting riders of motorcycles in many countries. Researches have shown that helmet legislation compels riders to use helmets, which ultimately leads to a

reduction of deaths resulting from motorcycle accidents [23], [22], [20], [16]. A study by [9], in the United States indicated that the average motorcyclist death rates were reduced by 22-33% in certain states with universal helmet legislation when compared with an era of no helmet legislation. It was also indicated that helmet legislation that covered only certain categories of riders reduced the average death rates by 7-10%.

In developing countries such as Ghana, motorcycle use is very common and is even being used as commercial taxis in Niger, Togo, Nigeria and Benin. This is because it has some strong advantages such as its easy manoeuvrability, superior fuel economy and time saving over the commercial car taxis. However, in Ghana, there is less documentation on helmet usage by both riders and passengers as a safety measure. In addition, the use of motorcycle as

commercial taxis is creeping into Ghana and now being practiced, though on illegal basis. Therefore safety measures should be strong to prevent a lot of deaths from motorcycle riding. It was observed by the researchers that the number of motorcycles being involved in accident is on the ascendancy and involves both male and female. Most of these accidents witnessed involved victims without helmets. A study by [18] indicated that motorcycle riders in developing countries seemed more likely to ignore safety measures. Therefore, the focus of this study is to unearth the level of helmet usage among motorcycle riders and passengers in Ghana.

## **2. Methodology**

### *2.1 Study area*

The study was carried out in three municipal cities each from southern and northern sectors of Ghana. In these cities, motorcycle riding is one of the main means of

transportation apart from cars. This is because the cities are brisk business centres within the municipalities which involve fast movement of people and goods. Therefore most people prefer motorcycle riding relative to cars and taxis due to its quick movement and avoidance of traffic.

### *2.2 Research design and data collection techniques*

The research was carried out for six months along the principal routes within the cities during Monday, Wednesday and Friday mornings (06:30am -8:30 am) and evenings (03:30 pm -5:30 pm) where motorcycle riding is at its peak. These periods were considered because they are the “rush hours” in the cities where people are moving to and from their offices and other places. The methodology used in this study included roadside observation of helmet usage by riders (including their passengers) which constitute observation unit and questionnaire administration. Roadside observations were

made along the principal streets in the sampling cities. Observations were made at main junctions and traffic lights within the cities where many of the motorcycle riders use most often. The main junctions were selected randomly while purposive sampling technique was used to select the traffic lights as sampling points. Every motorcycle rider passing by the selected sampling points were observed. Risk factors observed for, included proper and improper wearing of the helmet by both riders and passengers. Improper wearing of helmet was categorized as not wearing helmet, wearing helmet without locking the securing chinstrap and / or without the face shield in place. These factors were considered since they are accident risk factors especially for head injury.

Questionnaires were administered to 1182 motorcycle riders who were selected randomly from both southern and northern sectors. The questionnaire has both closed

and open ended questions. The questions centered on rider's knowledge, perception, attitude, behaviour and legislation towards helmet usage.

### *2.3 Statistical Analysis*

Data from the questionnaire were coded and entered into the Statistical Package for Social Scientist program (SPSS version 16). Descriptive statistics and tables were generated from the program. Mann–Whitney U-test was used to test differences between responses from the southern and northern sectors.

## **3. Results and Discussion**

### *3.1 Observational study results*

A sample of 10,428 and 10,980 motorcycle riders were observed from southern and northern sectors of Ghana respectively given total sample size of 21,108. Out of the motorcycle riders observed, 5,004 (47.9%) and 7,620 (71.4%) were riders who were not carrying passengers from the southern and northern sector respectively (Table I).

Further observation indicated that 3,444 (33%) and 5,680 (53.2%) were riders not wearing helmets for southern and northern sectors respectively. This clearly shows that most motorcycle riders do not prefer wearing helmet especially in the northern sector of Ghana while riding. This is because in the northern sector of Ghana, motorcycle riding is prevalent than the southern sector. In addition, motorcycle riding is one of the activities a person must know while growing in the northern sector which results in them becoming too familiar with the motorbike and hence ignores safety measures such as helmet usage.

It was also observed that 5,424 (52.1%) and 2,920 (27.4%) motorcycle riders were carrying passengers while riding in the southern and northern sectors respectively (Table I). More motorcycle riders with

passengers were observed in southern sector due to the fact that, in the northern sector of the Ghana, almost in every household, a member of the family owns a motorcycle which is their main source of transport for goods and services. The study further shows that 4,380 (42%) and 2,360 (22.1%) observed were both motorcycle riders and passengers not wearing helmet in the southern and northern sectors respectively. A similar study carried out in Shantou and Chaozhou, Guangdong Province in China also indicated that 34% of the motorcycle drivers and 70.5% of the passenger did not wear a helmet at all [14]. This indicated that most motorcycle riders and passengers do not wear helmets while riding on motorcycle in Ghana.

Table I: Patterns of helmet usage observed among motorcycle riders

Observations made	Sector	
	Southern	Northern
<b>Riders only</b>		
<i>Wearing and proper</i>	576 (5.5)	1940 (18.2)
<i>Wearing and not proper</i>	984 (9.4)	0.0 (0.0)
<i>Not wearing</i>	3444 (33)	5680 (53.2)
<b>Riders with passenger</b>		
<i>Passenger and rider wearing and proper</i>	48(0.5)	0.0 (0.0)
<i>Both passenger and rider not wearing</i>	4380(42)	2360(22.1)
<i>Both Passenger and rider wearing and not proper</i>	108 (1.0)	0.0 (0.0)
<i>Rider not wearing with Passenger wearing and proper</i>	156 (1.5)	0.0 (0.0)
<i>Rider wearing and proper with passenger not proper</i>	48 (0.5)	500 (4.7)
<i>Rider wearing and proper with passenger not wearing</i>	624 (6.0)	60 (0.6)
<i>Rider wearing and not proper with Passenger wearing and proper</i>	60 (0.6)	0.0 (0.0)
<b>Total</b>	<b>10428 (100)</b>	<b>10980 (100)</b>

Figures in bracket are percentages

This could be due to the fact that majority of riders do not have helmet since the motorcycle they own do not come with helmets. Most motorcycles were used ones (second hand) imported from foreign countries which are sold without helmets. They are not inclined towards the use of helmets and therefore do not see the essence of buying the helmets separately. In addition, there are no clear guidelines and rigid enforcement of the use of helmets which might compel riders to purchase helmets separately if the motorcycles do not come with helmets. Another observation was that, significant proportions of motorcycle riders were wearing the helmet properly with passenger not wearing at all in both southern and northern sectors. Most of these motorcycles were the ones bought from the dealers in Ghana which comes with only one helmet for the rider. The study further indicated that only small proportions of motorcycle riders were observed to be wearing the helmets and properly (i.e. locking the securing chinstraps and face shield in place). This conforms to a study by [26] that only 4965 (37.0%) motor drivers and 548 (12.9%) passengers were wearing helmets designed for

motorcyclists that were properly secured. This shows that the number of motorcycle riders wearing helmets as a protective gear is normally marginal in most developing countries such as Ghana.

### *3.2 Demographic characteristics of respondents*

The survey shows that out of the 1182 motorcycle riders interviewed from both the southern and northern sectors, most of them were males (Table II). There were no female respondents from the southern sector while 7.0% of the respondents were from the northern sector. Studies concerning helmet usage across the world show that more males ride motorcycle than females [26], [19], [14]. However, in the northern sector of Ghana, it was observed that a significant number of females were riding motorcycle because it serves as the main source of transportation within the cities and inter-town travels. It is also normally a means of transport to their various farms and females learn how to ride during their youthful days since conveyance of farm produce to the market is mainly done by women.

Table II: Demographic characteristics of respondents

Characteristics	N (%)	
	Southern	Northern
<b>Gender</b>		
<i>Male</i>	612 (52)	482 (41)
<i>Female</i>	0.0 (0.0)	88 (7.0)
<b>Age categories (years)</b>		
<i>15-20</i>	36 (3.0)	12 (1.0)
<i>21-25</i>	144 (12)	54 (4.7)
<i>26-30</i>	246 (21)	60 (5.1)
<i>31-35</i>	96 (8.0)	222 (18.8)
<i>36-40</i>	48 (4.2)	108 (9.1)
<i>41-44</i>	24 (2.0)	60 (5.1)
<i>45-50</i>	18 (1.5)	18 (1.5)
<i>&gt; 50</i>	0.0 (0.0)	36 (3.0)
<b>Educational level</b>		
<i>Primary</i>	66 (5.6)	54 (4.6)
<i>JHS/Middle school</i>	396 (33.6)	54 (4.6)
<i>Senior High school</i>	90 (7.7)	60 (5.1)
<i>Tertiary</i>	12 (1.0)	360 (30)
<i>Informal</i>	48 (4.2)	42 (3.6)

Majority of the motorcycle riders interviewed were 246 (21%) and 222 (18.8%) youths for southern and northern sector respectively. This is because youths are the active age bracket and involved in a lot of activities which relies on quick movement. Most of the motorcycle riders had up to junior high school education

in the southern sector (33.6%) while in the northern sector their educational levels were up to tertiary status. However, in the southern sector of Ghana, it was observed that most educated people who had up to tertiary education do not like riding motorcycle. They prefer the use of cars which creates a lot of



traffic congestion in the cities especially in the

### *3.3 Knowledge, attitude, perception and information regarding helmet usage*

The survey indicated that most of the motorcycle riders interviewed from both southern (38.6%) and northern (37.5%) sector of Ghana responded that they normally wear helmet when riding motorcycle or being carried on motorcycle (Table III). However, the observational study shows the contrary, i.e. most riders and passenger do not wear helmet when riding or being carried. When asked reasons for wearing helmets, majority of respondents from both the southern (44.2%) and northern sector (42.1%) said to prevent or reduce head injury. Responses were not statistically significant ( $p > 0.05$ ) for southern and northern sectors. In a similar study carried out in China, 88.9% of the motorcyclists were aware that helmets have a protective effect; only 20.4% reported that the main reason for wearing a helmet was to prevent or decrease the severity of head injury and 74.1% of respondents said they would wear a helmet to cope with police [14]. The study further shows that majority of motorcycle riders do not ask their passengers to wear helmet. This could be

metropolitan and municipal cities.

due to the fact that the motorcycle riders have only one helmet which is normally the case and would not release it to the passenger. Informal interview with motorcycle dealer shows that it is only one helmet that is added to a brand new motorcycle package hence the owner needs to purchase a spare one for a passenger. Most motorcycle riders from both the southern (49.2%) and northern (47.3%) sector were aware that helmet provides a form of protection during accident. This is because they have witnessed how helmet saved the lives of some of their colleague motorcycle riders that were involved in accident. A lot of studies show that motorcycle helmets decrease head injuries in a crash by about 70% and death by about 40% [15], and reduce the length of hospital stay and the medical costs of injured riders [5]. This is because helmet usage absorbs energy and prevents brain injury [15], [4], [21]. The study further shows that there were mixed feelings concerning education on helmet usage among respondents from the south whiles most respondents agreed that they had some form of education on helmet usage in the northern sector. This is because a lot of

motorcycle accidents are often witnessed in the northern sector relative to the south. According to [1] the Northern regions accounted for the most (34.7%) motorcycle fatalities in Ghana. Hence education could reduce the number of accidents. In addition, the motorcycle riders heard various messages concerning helmet usage. A significant difference was observed in this response for the southern and northern sector. According to the result, most respondents from both sectors do not see helmet wearing as a tendency of blocking

vision while riding. This is because the shield is transparent which allows a clear vision. However in a report by [14] interviewees (38.5%), in China said that helmets could block vision. In addition, motorcycle riders from both the southern and northern sectors believed that helmet usage is not only needed when riding on highways and are very comfortable when wearing helmet to ride motorcycle. However, a contrary result was obtained in China that many riders are not always comfortable (71.3%) when using helmet [14].

Table III: Respondents knowledge, attitude, perception and information regarding helmet usage

Questions	Sector N (%)		p-value
	Southern	Northern	
<b>Wear helmet when riding or being carried</b>			
<i>Yes</i>	456 (38.6)	444 (37.5)	0.335
<i>No</i>	156 (13.2)	126 (10.7)	
<b>Reasons for wearing helmets</b>			
<i>To prevent or reduce head injury</i>	522 (44.2)	498(42.1)	0.115
<i>Cope with police</i>	66 (5.6)	60 (5.1)	
<i>Personal dislike</i>	6.0 (0.5)	4.0 (0.3)	
<i>Prevent air and particles from entering eye</i>	12 (1.0)	8.0 (0.7)	
<i>Headache</i>	6.0 (0.5)	0.0 (0.0)	
<b>Ask passengers to wear helmet</b>			

<i>Yes</i>	276 (23.3)	282 (23.9)	0.287
<i>No</i>	336 (28.4)	288 (24.4)	
<b>Awareness of helmet protection during accident</b>			
<i>Yes</i>	582 (49.2)	558 (47.3)	0.067
<i>No</i>	30 (2.5)	12 (1.0)	
<b>Had education regarding helmet usage</b>			
<i>Yes</i>	306 (25.9)	408 (34.5)	0.000
<i>No</i>	306 (25.9)	162 (13.7)	
<b>Heard messages regarding helmet usage</b>			
<i>Yes</i>	480 (40.6)	486 (41.1)	0.032
<i>No</i>	132 (11.2)	84 (7.1)	
<b>Helmet wearing have tendency of blocking vision</b>			
<i>Yes</i>	120 (10.2)	174 (14.7)	0.002
<i>No</i>	492 (41.6)	396 (33.5)	
<b>Helmet usage needed only riding on highways</b>			
<i>Yes</i>	156 (13.3)	150 (12.8)	0.076
<i>No</i>	456 (38.7)	416 (35.2)	
<b>Feel wearing helmets</b>			
<i>Comfortable</i>	288 (24.4)	282 (24.0)	0.002
<i>Sometimes comfortable</i>	90 (7.6)	194 (16.4)	
<i>Not comfortable</i>	234 (19.8)	92 (7.8)	

$p = \text{Mann-Whitney } U\text{-test.}$

### 3.4 Views on law and enforcement

In Ghana, it is very difficult to show a clear regulation, guidelines or any policy regarding helmet usage by motorcycle riders. However, there is a general road traffic regulation (2009)

which guides all road users. According to most motorcycle riders from southern (46.2%) and northern (40.2%) sectors, riding motorcycle without helmet is against the law (Table IV). Informal interview with some riders indicated that if you are riding motorcycle without

helmet, the police could easily arrest you. He said: “*riding motorcycle without helmet means getting into trouble with the police*”. This is also due to strict enforcement helmet usage is receiving from the police especially at the southern sector of Ghana. In the northern sector, enforcement by police is not so strict which could be due to extensive education and messages they had heard. According to [14], 81.3% of respondents believed that it was against the law not to wear a helmet while riding a motorcycle in China. Both respondents from southern (45.2%) and northern (35.0%) sectors said they feel satisfied when they are compelled to wear helmet. This is because the law enforcement agents are ensuring the safety of the riders. According to one motorcycle rider from the

southern sector, “*If it had not been the Motor Transport and Traffic Unit (MTTU) of the police compelling us (riders) to wear helmets, I should have been dead by now when I was involved in an accident; the helmet really protected my head*”. Majority of respondents from both sectors (Table 4) also agreed that penalties should be imposed on motorcyclists riding without helmets. According to one motorcycle rider from one of the municipality in the Northern sector “*A spot fine of Gh₵ 200.00 (US \$105) was taken from me for not wearing a helmet as stipulated by the byelaws*”. It is interesting to note that the spot fine exceeds the cost of a brand new helmet (i.e. Gh₵ 45 equivalent of US \$24) by about 75%.

Table IV: Respondents' views on laws and enforcement of helmet usage

Questions	Sector N (%)		p-value
	Southern	Northern	
<b>Think riding without helmet is against any law</b>			
<i>Yes</i>	546 (46.2)	480 (40.6)	0.073
<i>No</i>	66 (5.6)	90 (7.6)	
<b>Police enforcement helmet usage is strict</b>			
<i>Yes</i>	534 (45.2)	140 (11.8)	0.000
<i>No</i>	30 (2.5)	314 (26.6)	
<i>Sometimes</i>	48 (4.0)	116 (9.8)	
<b>Feel OK when compelled to wear helmets</b>			
<i>Yes</i>	534 (45.2)	414 (35.0)	0.000
<i>No</i>	78 (6.6)	156 (13.2)	
<b>Do you agree that strict penalties should be imposed for not wearing helmets</b>			
<i>Agree</i>	510 (43.1)	482 (40.8)	0.685
<i>Don't agree</i>	102 (8.7)	88 (7.4)	

$p = \text{Mann-Whitney } U\text{-test.}$

### 3.5 Scenario of helmet usage in Ghana

Motorcycle riding is currently one of the commonest means of transportation in both rural and urban areas of Ghana. Motorcycle riding is not without accidents as it is in the case of other means of transportation hence safety measures are put in place to reduce injuries. One of these safety measures is the wearing of

helmets whiles riding. However, it was observed in Ghana that most riders violate this safety measure which would potentially reduce head injury in case of accident. In Ghana, there is no clear policy guideline on helmet usage by riders. It is the police and the municipal assemblies (through byelaws) who are enforcing helmet usage as a safety measure.

Therefore, clear legislation on helmet usage while riding would be appropriate and may reduce a number of head injuries resulting from motorcycle accidents. For instance, [24] argues that the helmet legislation reduced head injuries by up to 29% in Australia. Many studies also indicated that introduction of motorcycle helmet legislation is effective in preventing death when crashes occur [3], [6] but not effectively implemented in developing countries such as Ghana. However, poor legislation coupled with negative attitudes and perceptions regarding helmet usage in Ghana, it was observed that most motorcycle riders do not wear helmets while riding. Studies show that proper helmet use rate among motorcycle riders is lower in developing countries than developed ones partly due to poor implementation of legislation [10], [2], [13].

Meanwhile, the use of motorcycle as commercial transportation (motorcycle taxis) is being practiced in some Sub-

Sahara African countries such as Niger, Benin, Togo and Nigeria and illegally being operated in Ghana. In Niger, motorcycle taxis commonly called “Kabou-Kabou” are used in several cities or large villages. In the Togolese capital Lomé, the motorcycle taxis, also called “Zemidjan” or “Oléyia” numbered about 40,000 in 2002. Now, there are close to 70,000 motorcycle taxis and each carrying an average of 60 people per day. Motorcycle taxis have been widely adopted by the Togolese, providing up to 80% of the transport needs [11]. The motorcycle taxis are referred to as “Okada” in Nigeria. Motorcycle taxis originated as a solution to search for a way of beating the traffic congestion that often delayed people attempting to reach their destinations in time. Traffic congestion is one of the challenges being faced in most cities in Ghana, thus the emerging of the motorcycle taxis is being used as an alternative to curb the traffic congestion on the roads. Although the practice is having

a positive impact, most riders and passengers are not wearing helmets, a safety gear. Accidents witnessed involving such motorcycle taxis were very disastrous. In addition, the motorcycle taxi riders have formed unions and are petitioning the government to legalize their operation. A lot of people are advocating for the operation of motorcycle taxis in the villages and rural areas where access roads are in a deplorable state especially during the raining season. They believe this would reduce their plight of trekking so many kilometers before coming to the urban centres or locations where they could access cars. According to one respondent, *“motorcycle taxis could assist villages that are not accessible to passenger vehicles and would also go a long way to alleviate the transportation difficulties of the people. The operation of motorcycle transport service popularly*

*called ‘Okada’ also gives job opportunities to the youth.”* Furthermore, the other important advantage which these motorcycle taxis have over the car taxis is that, it is used mainly on footpaths (easy maneuverability) linking remote villages and farms which are not motorable. Other factors which are influencing the growth of motorcycle (and motorcycle taxis) in Ghana include time saving, door to door service, improved mobility, superior fuel economy, it is easily accessible and demand responsive. However, other negative effects on its usage especially as commercial motorcycle include frequent accidents, poor safety or could easily be used to commit crime and their activities cannot be easily regulated. The number of registration of motorcycle is on the increase in Ghana as shown in Figure 1. This depicts the increase use of motorcycles in Ghana.

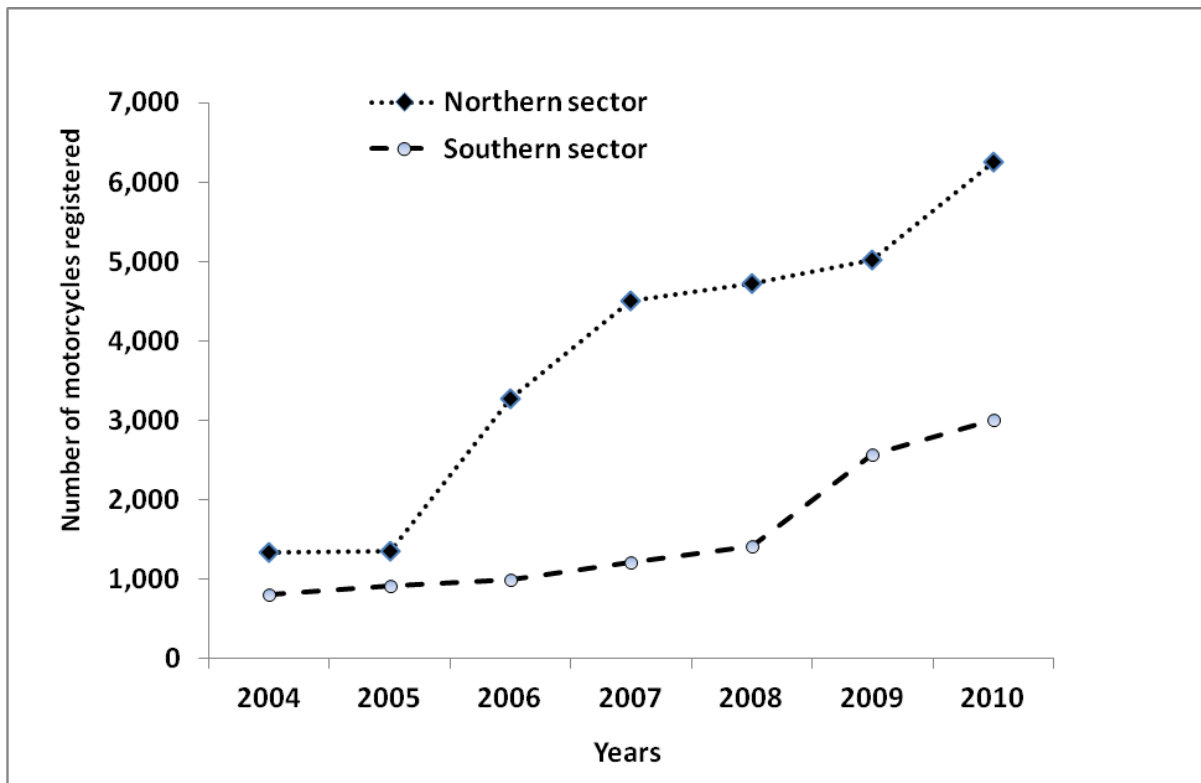


Fig 1: The trend of registration of motorcyces in Ghana (DVLA, 2011).

It was also observed that, in Ghana non-use of helmets by motorcycle riders and passengers comes with some form of perception. Some riders believe it makes them very uncomfortable whiles riding and makes visibility poor especially when the transparent shield becomes old. They were of the opinion that helmet wearing is to cope with the police and avoid being fined and not necessarily for their safety because they were of the view that they had a lot of experience in motorcycle riding. This

assertion normally comes from young motorcycle riders although not thoroughly researched into. For instance a study in China shows that both young age and male gender were significantly associated with the perceptions that helmets block vision and uncomfortable to wear a helmet whiles riding [14]. This is also supported by a finding that motorcycle riders in developing countries seemed more likely to ignore safety measures [18]. Another perception which is preventing passengers



from wearing helmets is the fear of infection. They were of the view that sharing helmets with other people could result in infection to them through sweat. Some people also have the opinion that helmet wearing could result in suffocation. A respondent said *“anytime I wear helmet on a motorbike, I don’t have enough air to breath and it is very heavy on my head”*. Because of frequent occurrence of accidents involving motorcycles, education campaigns on safety measures are highly encouraged.

This study had some degree of limitations. There was no link with people observed

#### 4. Conclusion

Motorcycle riding is one of the commonest means of transportation in both developed and developing countries. However, the use of motorcycles could result in accidents hence the need to use safety gear. One of such gears is helmet usage, which is worn to prevent head injury in

whiles riding motorcycle with respondents of the questionnaires. Therefore, no correlation could be done. There could be some form of bias since respondents who were willing to participate in the study were the ones interviewed. And because the interviews were conducted whiles the motorcycle riders were not riding, their responses could not be directly linked to what is being practiced. The season, type of roads and days in the week (i.e. whether week day or weekend) was not considered in this study, although they are factors that could easily affect the use of helmets.

case of accident. The study shows that most people (riders) in Ghana do not wear helmets when riding motorcycles including passengers, although they are aware of its use as a safety measure. Enforcement is carried out at a low level because there are no clear guidelines

regulating the use of helmet which is restricting the enforcement agencies. Thus strong legislation regarding helmet and motorcycle use as commercial taxis would be appropriate to reduce accidents. Although the protective nature of helmet is well documented, other aspects of its

usage, on the type of road, time of wearing, helmet design and modifications should be studied so it would be incorporated into the educational programs. The stress on proper wearing would be effective in preventing head injury in case of accident.

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