

## Assessing the Epidemiology of Road Traffic Accident Cases in the Ashanti Region of Ghana

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### Abstract

**Introduction:** Road Traffic Accident (RTA) cases are major public health threat worldwide, and without preventative measures are projected to increase over the next 20 years. This study assessed the burden of RTA on the Asante Akyem segment of the Accra-Kumasi trunk road in Ghana.

**Methods:** Structured questionnaire was used to extract data on RTA cases, which occurred in 2011-2015, from Juaso and Konongo Municipal Motor Traffic Units (MTU) registry. The data collected were analysed descriptively using univariate analysis via Epi info version 7.

**Results:** There were 774 RTA cases which recorded 1408 injuries with 293 deaths over five-year (2011-2015) period. The RTA cases mostly occurred on Saturdays between 12 noon and 6pm within the months of March and August. Cargo trucks accounted for most of the RTA cases and the commonest mechanism of the RTA cases was head-on collision. Konongo high street and Odumasi 3 lane areas were the most accident-prone locations with the latter accounting for the highest number of casualties. The Yawkwei and Asankare areas, however, have gained notoriety for fatalities.

**Conclusions:** This study provides an insight into RTA cases as a major public health threat in the Asante Akyem Districts. Most of the causes of RTA seemed to be known, but a multi-sectoral approach will be required to curb the menace. There is the need for all stakeholders including government, the Ghana Private Road Transport Union, road construction engineers, civil society organizations and non-governmental organizations to intensify road traffic and safety education, and enforce road traffic regulations to curtail RTA.

**Keywords:** Road traffic accident, public health, epidemiology, preventative measures.

### Introduction

According to the Organisation for Economic Co-operation and Development [OECD], road traffic accident (RTA) is an accident which occurs or originates on a way or street open to public traffic; results in one or more persons being killed or injured, and at least one moving vehicle is involved [1]. These accidents therefore include collisions between vehicles, between vehicles and pedestrians and between vehicles and animals or fixed obstacles. Single vehicle accidents in which one vehicle alone (and no other road user) is involved are included [2]. Multi-vehicle collisions are counted only as one accident provided that the successive collisions happen at very short intervals. Road Traffic Accident (RTA), in the context of this study, is operationally defined as accident which takes place on the road between two or more objects, one of which must be any kind of moving vehicle. Any injury on the road without the involvement of a vehicle (for example, a person slipping and falling on the road and sustaining injury) or persons getting injured while washing or loading a vehicle were excluded. Additionally, RTA cases which occurred within the communities and branch roads were also excluded from the list.

Road traffic accident cases account for the largest proportion of unintentional injuries, and are increasingly recognized in low-income countries as a major cause of morbidity and mortality, especially in adults below the age of 50. This exposes people to an unsafe environment leading to traffic injuries and deaths [3, 4]. According to the global status report on road safety in 2015, the World Health

Organization (WHO) African region rate of fatalities from road traffic injuries worldwide was 26.6 per 100,000 population for the year 2013 [5]. According to the World Health Organization, an estimated US\$500 billion a year is lost through RTA of which about US\$100 billion is lost in developing and the transition countries of Eastern Europe [6]. The annual road traffic fatality rate for developing countries stood at 20.1% per 100,000 population compared to 8.7 per 100,000 in high income countries [3]. 100,000 population) and lowest in Europe [10.3 per 100,000] [3]. Studies has shown that the risk of dying as a result of RTA is highest in the African Region (24.1 per Worldwide the number of people killed in RTAs each year is statistically estimated to be around 1.2 billion, while the number injured could be as high as 50 million. In Ghana, the Ashanti, Eastern, Greater Accra, Central and Brong Ahafo Regions account for more than 70% of the total number of crash fatalities [7].

Akongbota found out that about 30% of RTAs in Ghana are caused by over speeding [8]. Other contributing factors they found included driving while intoxicated, driver fatigue, use of cell phone while driving, poor weather conditions and bad road design among others. Ayeboo identified that the numerous accidents on our road networks have been linked to various causes which include over speeding, drink driving, wrong over taking, poor road network and the rickety vehicles which ply on our roads [9]. The cause of death of casualties has been associated with many factors such as secondary collision, failure of drivers and vehicle occupants to put on seat belt and riders failing to put on helmet [10]. The size of a vehicle has also been found to contribute to the death of road users in traffic crashes. From the findings of Broughton in his study into road accidents data from 2001 to 2005, it was revealed that the driver casualty rate increases with the size of the other vehicle in collision [11]. Buses and minibuses cause 35% of fatal crashes while cars are responsible for 32%.

There is substantial evidence to prove that road accident occurs in a given time period with regard to season, month, day and time of occurrence. Kumar, Sanjeau, Agawam, Kava and Dora, for instance, identified November as the month with the highest number of fatal accidents in Delhi, 11.04% of all fatal accidents in Delhi occurred in November [12]. This finding contradicted the result obtained in Nepal by Jha and Agrawal who found that July was the month in which most fatal accidents occurred in Nepal [13]. A research conducted in Delhi found that most people were killed in road accidents which occurred in January, but a higher incidence of road accidents with much victims occurred in May and March in India [14]. The Ghanaian Times newspaper reported on the 16th day of November, 2011 that a total of 1,986 lives were lost in the country through road accidents from January to October, 2011. A study by Kumar et al. found out that most fatal accidents in South Delhi, India occurred on Saturday [12]. Also, a study by Jha and Agrawal found out that the highest number of road accidents at Nepal, occurred on Sunday and the least number on Monday [13]. A study at South Africa found that most people died through road accidents which occurred on Saturday (20.8%) followed by Sunday with 17.1% [15].

In Ghana, RTA is a major but neglected public health issue that requires concerted efforts for effective and sustainable prevention. Media reports in 2001 rated Ghana as the 2<sup>nd</sup> highest road traffic accident prone nation among six West African countries, with about 73 deaths per 1000 accidents [16]. Further, statistics from the National Road Safety Commission shows that, Ghana loses about 1.7 percent of its Gross Domestic Product (GDP) which is over 250 million dollars every year besides the loss of lives to RTA [17]. The Asante Akyem segment of the Accra-Kumasi trunk road has witnessed several RTA cases in recent times. This RTAs have resulted in loss of several lives and properties running into several millions of dollars. So many factors have been blamed for the rampant spate of RTAs on the roads.

Road traffic accident cases are increasingly becoming a major public health threat along the Asante Akyem stretch of the Accra-Kumasi trunk road. Over the past few years several lives and properties have been lost through RTAs. The level of vehicular accidents in Ghana is alarming and particularly sad since they are all preventable. The National Road Safety Commission also iterated that about 98% of road accidents can be avoided if drivers as well as road users are disciplined. Despite increased road safety campaigns, the rate at which accidents occur on our roads is very alarming. Most of the causes of RTAs seem to be known, but a concerted effort will be required to curb the menace. Even though there has been a lot of media publicity and public outcry about the spate of RTAs on this stretch of the road, not much work has been done in terms of research. For this reason, this study determined the trend

of RTA cases along the Asante Akyem segment (Juaso and Konongo) stretch of the Accra-Kumasi trunk road over five-year (2011-2015) period. Additionally, it investigated epidemiological factors associated with the RTAs along the Asante Akyem segment stretch of the Accra-Kumasi trunk road.

## Materials and methods

This purely quantitative study adopted the retrospective cross-sectional design. The data captured included those of road traffic accidents occurring along the Asante Akyem stretch of the highway extending from Nnadieso to Boankra. The data collected included the year, month, time and place of accident, the number of vehicles and type of vehicles involved in the accident, the accident category and mechanism of the accident. The total number of casualties and possible fatalities per each accident episode were also elicited. In instances where a motor bike was involved, data was collected on whether the motor bike was licensed or not and whether the rider wore a protective helmet at the time of the crash. For this study, structured questionnaire was used to extract RTA data from the Municipal Motor Traffic Units (MTU) registry. Additionally, there was documentary review of the data from the MTU registry over a five-year period (2011-2015). To ensure face validation of the questionnaire, it was given to colleague public health practitioners for peer review. Regarding content validation, it was given to experts in the fields of road traffic accident, epidemiology and public health for review. Quality control checks were performed for completeness, internal consistency and accuracy to ensure reliability of the questionnaire, and the data collected.

## Results

The data is presented and analysed under two basic themes. These are: the trend in RTA cases along the Asante Akyem segment (Juaso and Konongo) stretch of the Accra-Kumasi trunk road over five-year (2011-2015) period; epidemiological factors associated with the RTAs along the Asante Akyem segment stretch of the Accra-Kumasi trunk road.

### **The trend in RTA cases along the Asante Akyem segment (Juaso and Konongo) stretch of the Accra-Kumasi trunk road over five-year (2011-2015) period**

**Table 1.** Trend in the yearly occurrence of road traffic accident cases and casualties

| Year  | n(%)      | Casualties |           |          |
|-------|-----------|------------|-----------|----------|
|       |           | Minor      | Severe    | Deaths   |
| 2011  | 143(18.5) | 74(21.1)   | 276(78.9) | 70(23.8) |
| 2012  | 154(19.9) | 98(46.0)   | 115(54.0) | 37(12.6) |
| 2013  | 178(23.0) | 105(35.1)  | 194(64.9) | 65(22.2) |
| 2014  | 148(19.1) | 103(36.0)  | 176(63.1) | 69(23.5) |
| 2015  | 151(19.5) | 129(48.3)  | 138(51.7) | 52(17.7) |
| Total | 774(100)  | 509(36.2)  | 899(63.8) | 293(100) |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

N= 774 RTA cases < 1408 of injuries due to differences in number of passengers on board a vehicle.

N= 774 RTA cases >293 of RTA deaths due to differences in number of passengers on board a vehicle.

### **The figures in parentheses are in percentages**

The highest number of road traffic accident cases on the Juaso and Konongo stretch of the Accra-Kumasi trunk road occurred in the year 2013. The number of RTA cases per year rose up steadily till 2013 after which there was a slight decline in 2014, it picked up again in 2015. Out of a total of 1408 minor and severe injuries, the highest number of injuries of (350) occurred in 2011 followed by 2013 with 299 injuries. The number of serious accidents was consistently higher than the minor accidents throughout the entire period. There was a total of 293 deaths during the five-year period. Using 188,753 as the population of the two districts for the computation gives a mortality rate of 155.2 per 100,000 population.

**Table 2.** Trend in the monthly occurrence of road traffic accident cases and casualties

| Month        | (n%)            | Injuries         | Deaths          |
|--------------|-----------------|------------------|-----------------|
| January      | 57(7.4)         | 106(7.5)         | 20(6.8)         |
| February     | 65(8.4)         | 102(7.2)         | 22(7.5)         |
| March        | 86(11.1)        | 175(12.4)        | 36(12.3)        |
| April        | 66(8.5)         | 101(7.2)         | 26(8.9)         |
| May          | 59(7.6)         | 101(7.2)         | 18(6.1)         |
| June         | 60(7.8)         | 112(8.0)         | 20(6.8)         |
| July         | 49(6.3)         | 72(5.1)          | 9(3.1)          |
| August       | 75(9.7)         | 170(12.1)        | 37(12.6)        |
| September    | 57(7.4)         | 135(9.6)         | 47(16.0)        |
| October      | 63(8.1)         | 113 (8.0)        | 21(7.2)         |
| November     | 72(9.3)         | 105(7.5)         | 21(7.2)         |
| December     | 65(8.4)         | 116(8.2)         | 16(5.5)         |
| <b>Total</b> | <b>774(100)</b> | <b>1408(100)</b> | <b>293(100)</b> |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

The highest number of accident cases (86) over the entire period occurred in March. This was followed by August and November with 75 and 72 cases, respectively. The highest number of injuries of 175 (12.4%) occurred in March followed by August with 170 (12.1%) injuries. The month of September recorded the highest number of deaths (47) followed by August and March with 37 and 36 deaths, respectively.

**Table 3.** Trend in the occurrence of road traffic accident cases by days of the week and casualties

| Year         | No. of accidents<br>n (%) | Casualties<br>n (%) | Deaths<br>n (%)  |
|--------------|---------------------------|---------------------|------------------|
| Monday       | 103(13.3)                 | 214(15.2)           | 43(14.7)         |
| Tuesday      | 109(14.1)                 | 135(9.6)            | 24(8.2)          |
| Wednesday    | 92(11.9)                  | 126(8.9)            | 30(10.2)         |
| Thursday     | 101(13.1)                 | 226(16.1)           | 58(19.8)         |
| Friday       | 127(16.4)                 | 204(14.1)           | 50(17.1)         |
| Saturday     | 130(16.8)                 | 271(19.2)           | 37(12.6)         |
| Sunday       | 111(14.1)                 | 232(16.5)           | 51(17.5)         |
| <b>Total</b> | <b>773(100)</b>           | <b>1408(100)</b>    | <b>293 (100)</b> |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

The highest number of accident cases (130) and injuries (271) occurred on Saturdays followed by Fridays but the highest number of deaths (58) occurred on Thursdays.

**Table 4.** Trend in the occurrence of road traffic accident cases by time of the day and casualties

| Time of accident | Number of Accidents | Injuries   | Deaths    |
|------------------|---------------------|------------|-----------|
|                  | n (%)               | n (%)      | n (%)     |
| 6am-11.59am      | 170(22.0)           | 273(19.4)  | 45(15.4)  |
| 12noon-5.59pm    | 280(36.2)           | 483 (34.3) | 97(33.1)  |
| 6pm-9.59pm       | 158(20.4)           | 211(15.0)  | 44(15.0)  |
| 10pm-5.59am      | 166(21.4)           | 441(31.3)  | 107(36.5) |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

There were a total of 1408 injuries of various degrees and 293 deaths. Twenty-two (22%) cases of the accidents occurred between 6am and 12 noon. Also, 280 (36.2%) of the accidents occurred between 12 noon and 6 pm, likewise 158(20.4%) occurred between 6pm and 10pm with another 166(21.4%) occurring between 10pm to 6am. Most of the accidents occurred 12 noon and 6pm. The highest number

of injuries were recorded in the accidents that occurred between 12 noon and 6pm (34.3%) followed closely by those that occurred between 10pm and 6am (31.3%). Two hundred and seventy-three (19.4%) injuries were also recorded the morning hours (6am-12 noon) while 211(15.0%) were recorded in the evening hours (6pm-10pm). More deaths (107) which represent 36.5% were recorded in accidents occurring between midnight and dawn, followed by those occurring between 12pm and 6pm (97) which constitutes 33.1%. This was followed closely by 45(15.4%) and 44(15.0%) deaths) in the morning and evening, respectively.

**Table 5.** Trend in the place of occurrence of death after road traffic accident cases

| Place of death after RTA | Number (n) | Percentage (%) |
|--------------------------|------------|----------------|
| In the hospital          | 12         | 7.6            |
| On the spot              | 134        | 85.4           |
| On the way to hospital   | 11         | 7.0            |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

About 85% of the RTA victims died on the spot while nearly 15% either died in hospital or on the way to hospital (Table 5).

**Table 6.** Trend in road traffic accident cases, injuries and deaths by location

| Place of accidents  | n (%)            | Deaths          | Injuries         |
|---------------------|------------------|-----------------|------------------|
| Odumasi 3-lane      | 126(16.3)        | 27(9.3)         | 224(15.9)        |
| Odumasi Area        | 27(3.5)          | 4(1.4)          | 24(1.7)          |
| Ohene Nkwanta       | 73(9.4)          | 19(6.5)         | 144(10.2)        |
| Akrantebesa         | 57(7.4)          | 6(2.1)          | 51(3.6)          |
| Konongo High Street | 142(18.4)        | 15(5.2)         | 136(9.7)         |
| Atwedie Area        | 42(5.4)          | 19(6.5)         | 70(5.0)          |
| Bomfa Junction      | 42(5.4)          | 11(3.8)         | 54(3.8)          |
| Habitat Junction    | 16(2.1)          | 4(1.4)          | 35(2.5)          |
| Juaso 3-lane        | 15(1.9)          | 7(2.4)          | 32(2.3)          |
| Juaso Junction      | 25(3.2)          | 9(3.1)          | 44(3.1)          |
| Juaso Area          | 43(5.6)          | 21(7.2)         | 130(9.2)         |
| Lady D              | 7(0.9)           | 2(0.7)          | 9(0.6)           |
| New Koforidua       | 23(2.9)          | 10(3.4)         | 50(3.6)          |
| Nobewam             | 29(3.7)          | 7(2.4)          | 45(3.2)          |
| Yawkwei Town        | 34(4.4)          | 45(15.5)        | 119(8.5)         |
| Asankare Area       | 19(2.5)          | 36(12.4)        | 110(7.8)         |
| Duampompo           | 26(3.4)          | 9(3.1)          | 57(4.0)          |
| Kantaso             | 7(0.9)           | 5(1.7)          | 22(1.6)          |
| Pra River Area      | 17(2.0)          | 31(10.1)        | 46(3.3)          |
| Boankra             | 2(0.3)           | 1(0.3)          | 2(0.1)           |
| Other               | 2(0.3)           | 2(0.6)          | 4(0.3)           |
| <b>Total</b>        | <b>774 (100)</b> | <b>293(100)</b> | <b>1408(100)</b> |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

The highest number of accidents (18.4%) occurred within the Konongo high street area followed by the Odumasi 3 lane area with 126 cases (16.3%). The highest number (224) which represents 15.9% of injuries occurred at the Odumasi 3 lane area, but the highest number of deaths occurred at the Yawkwei area (15.5%) followed by the Asankare area (12.4%), Pra River area (10.1%) and then the Odumasi 3 lane area (9.3%).

**Table 7.** Trend in road traffic accident cases by category of vehicles

| Category     | Number (n)  | Percentage (%) |
|--------------|-------------|----------------|
| Private      | 359         | 31.4           |
| Commercial   | 730         | 63.8           |
| Other        | 55          | 4.8            |
| <b>Total</b> | <b>1144</b> | <b>100</b>     |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

N= 1144 vehicles > 774 RTA cases due to multi-vehicle accidents or collisions.

More than 60% of the accidents involved commercial vehicles while a little over 30% involved private vehicles. Among the commercial vehicles, about a third of the accidents are caused by articulated and mini trucks. About 14% of the accidents involved private saloon cars whereas about 9.4% and 7.3% involved mini buses and big passenger buses.

**Table 8.** Road traffic accident by vehicle category

| Type of vehicle    | Accident cases (n) | Percentage (%) |
|--------------------|--------------------|----------------|
| Articulator truck  | 180                | 14.5           |
| Big passenger bus  | 91                 | 7.3            |
| Cargo truck        | 66                 | 5.3            |
| Mini bus           | 117                | 9.4            |
| Mini truck         | 183                | 14.8           |
| Pickup             | 81                 | 6.5            |
| Private saloon car | 178                | 14.4           |
| Sprinter mini bus  | 57                 | 4.6            |
| SUV (4X4)          | 75                 | 6.1            |
| Fuel tanker        | 11                 | 0.9            |
| Taxi               | 120                | 9.7            |
| Timber truck       | 5                  | 0.4            |
| Tipper truck       | 7                  | 0.6            |
| Van                | 14                 | 1.1            |
| Motor bike         | 47                 | 3.8            |
| Other              | 8                  | 0.6            |
| <b>Total</b>       | <b>1240</b>        | <b>100</b>     |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

N= 1240 vehicles > 774 RTA cases due to multi-vehicle accidents or collisions.

Taxi cabs contributed about 10% of the accidents, whereas big passenger buses contributed 7.3%.

**The epidemiological factors associated with the RTA cases along the Asante Akyem segment of the Accra-Kumasi trunk road**

**Table 9.** Causes of road traffic accidents

| Causes of accident                  | Number (n) | Percentage (%) |
|-------------------------------------|------------|----------------|
| Brake failure/Mechanical defect     | 36         | 6.9            |
| Careless driving/Driver intoxicated | 41         | 7.9            |
| Head-on collision                   | 263        | 50.4           |
| Improper overtaking                 | 23         | 4.4            |
| Knock from the rear                 | 23         | 4.4            |
| Over-speeding                       | 36         | 6.9            |
| Ran into ditch/Object/ Side-swipe   | 69         | 13.2           |
| Other                               | 31         | 5.9            |

Source: Asante Akyem Municipal Motor Traffic Unit (MTU) registry.

It is evident from this study that the commonest mechanism of road traffic accident along the Asante Akyem stretch of the Accra-Kumasi trunk road was head-on collision followed by collision with an object or a side swipe. Most road traffic accident cases involving head-on collisions were as a result of over-speeding.

## Discussion

The study found that casualties and mortality rate associated with road traffic accident cases, along the Asante Akyem stretch of the Accra-Kumasi trunk road for the period 2011-2015, were relatively high (Table 1). Road traffic accident cases accounted for a mortality rate of 155.2 per 100,000 population in the two districts over the five-year period. This finding gives credence to studies by Adeloje et al. who found that the risk of dying as a result of RTA is highest (24.1 per 100,000 population) in the African Region [3]. They established that the annual road traffic fatality rate for developing countries now stands at 20.1% per 100,000 population.

It is evident from this study that the commonest mechanism of road traffic accident on the Asante Akyem stretch of the Accra-Kumasi trunk road was head-on collision followed by collision with an object or a side swipe (Table 9). Most road traffic accident cases involving head-on collisions were as a result of over-speeding. This finding concurs with the views of Akongbota who found out that about 30% of RTAs in Ghana are caused by over speeding [8]. Akongbota cited other contributing factors such as driving while intoxicated, driver fatigue, use of cell phone while driving, poor weather conditions, and bad road design among others [8]. This finding also validates the views of Ayeboo who averred that numerous accidents on our road networks have been linked to various causes, especially over speeding [9]. Other studies by Afukaar et al. attributed the many death and casualties related to road traffic accidents to secondary collision [10].

Evidence gathered from this study revealed that the highest number of road traffic accident cases on the Asante Akyem stretch of the Accra-Kumasi trunk road over the entire period (86) occurred in March, followed by August and November with 75 and 72 cases, respectively (Table 2). The finding that the month of November is notable for high occurrence of road traffic accidents in the study setting substantiates the views of Kumar et al. who also identified November as the month with the highest number of fatal accidents in Delhi [12]. However, this finding contradicts the result obtained in Nepal by Jha and Agrawal (2004) who found that July was the month in which most fatal accidents occurred in Nepal [13].

It also emerged from the findings of this that the highest number of road traffic accident injuries of 175 (12.4%) on the Asante Akyem stretch of the Accra-Kumasi trunk road occurred in March followed by August with 170 (12.1%) injuries (Table 6). Similarly, the month of September recorded the highest number of deaths (47) followed by August and March with 37 and 36 deaths, respectively. These findings were found to be inconsistent with the observation by the India National Crime Records Bureau which reported that most people were killed in road accidents which occurred in January, but a higher incidence of road accidents with much victims occurred in May and March in India [14].

The findings of this study indicated that the highest number of road traffic accident cases (130) and associated injuries (271) on the Asante Akyem stretch of the Accra-Kumasi trunk road occurred on Saturdays (Tables 3, 4). This observation is consistent with the views of Kumar et al. who found out that most fatal accidents in South Delhi, India occurred on Saturday [12]. This finding also buttresses a report by the South African Injury Mortality Surveillance System which indicated that most people died through road accidents which occurred on Saturday followed by Sunday [15]. Notwithstanding, the findings of this study contradict the observation by Jha and Agrawal that the highest number of road accidents at Nepal, occurred on Sunday and the least number on Monday [13].

It unfolds from the findings of this study that taxi cabs contributed about 10% of the road traffic accident cases on the Asante Akyem stretch of the Accra-Kumasi trunk road, whereas big passenger buses contributed 7.3% (Tables 7, 8). This revelation is in tandem with a report by the National Road Safety Commission of Ghana (2011) which indicated that casualty rate associated with road traffic accident cases in Ghana increase with the size of the other vehicle in collision [21]. The report cited buses and mini-buses cause 35% of fatal crashes while cars are responsible for 32%.

## Conclusions

Road traffic accident is a major public health threat in the Asante Akyem Districts in the Ashanti Region of Ghana. Most of the causes of RTA seemed to be known, but a multi-sectoral approach will be required to curb the menace. In view of the evidence gathered from this study, the study makes the following recommendations:

- i. The Police MTTU in the Asante Akyem Municipality should intensify road safety education activities, and impose stiffer punishments on offenders of road traffic regulations. They should also embark on random monitoring of the blood alcohol levels of drivers and bring to book all recalcitrant drivers.
- ii. Drivers of spoiled cargo vehicles on the Konongo high street, especially the Juaso, Odumasi, and Duampompo three lanes, need to properly place triangles on both sides of the road to warn other road users, and also to briskly tow spoiled abandoned vehicles to avoid collision.
- iii. The Government of Ghana should provide a by-pass on the Konongo high street, especially the Juaso, Odumasi, and Duampompo three lanes which are places of rampant accidents.
- iv. The Government of Ghana should dualized the Accra-Kumasi road so as to provide enough parking space for cargo cars.

## Limitations of the study

A limiting factor of this study was that the data for this study consisted of mainly data from the MTTU repository; it failed to capture very vital variables such as the number of passengers in each vehicle as well as the number of injuries or deaths per vehicle. The data also could not state the exact mechanism of the RTA and the socio-demographic characteristics of the occupants at the time of the accident. There is therefore the need for a different type of study that will examine all the above. In view of the fact that all RTAs occurring on all other branch roads within the Asante Akyem Municipalities were excluded from the final analysis, and the fact that not all RTAs occurring along the Asante Akyem stretch were reported to the police, the findings of this study is not likely to be representative of the entire District.

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