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Mamabot A System Based On Ml And Nlp For Supporting Women And Families During Pregnancy

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Abstract –

Motorcycle registrations and accident reports in Bolgatanga Municipality were the subjects of the research. We also used trend analysis and the survey approach. Having said that, here are the results of the study: Within the municipality, there is a noticeable underreporting of motorbike accidents. People do not report these accidents to the police for various reasons, including: not being able to identify the person involved, believing it is not necessary to report, fear of punishment, distance, and fear that the police will demand money.Motorcycle accidents may happen for a variety of reasons, including but not limited to: colliding with another vehicle, hitting an animal, hitting the pavement, or being struck by a motor. Financial hardship has crept in as a consequence of most sufferers' diminished capacity to work and as a result, some have resorted to borrowing, using savings, or selling possessions.Underreporting of accidents in the Municipality may be helped if the public is educated on the need of reporting them to the police. The study projected that the total number of motorbike registrations would rise to 7,679 in 2017. This means that the roads in the municipality will need to be expanded to accommodate all those bikes. Additionally, the MTTU should work with the National Safety Commission to launch a public awareness campaign teaching motor riders the importance of reporting accidents to the police and obeying safety precautions. This will help reduce the likelihood of motorists being followed by law enforcement Research on the correlation between driver's licence status and traffic accidents in Ghana is also possible.

Keywords: *Time Series Analysis, Linear trend model, Quadratic trend model, Autocorrelation Function, Partial Autocorrelation Function, Stationarity, Parameter Estimation, Parsimonious model, accidents and Differencing*

1.1 Background of the Study

One of the best ways to go across Northern Ghana is on a motorbike. Before these motorbikes may be legally driven, they must be registered and assigned a licence plate.
The first goal is to have an accurate count of motorcyclists in the area; a secondary goal is to generate tax income for the government; and finally, a third and last reason is to be able to trace the bikes back to their rightful owners in the event of an accident or theft.
Some motorbikes continue to be visible on our roads without licence plates, notwithstanding the valid reasons given above.
A valid driver's licence is also necessary to operate one of these motorbikes. A person's ability to ride a motorbike safely on public roads, without endangering themselves or others, is an essential qualification for a motorcycle licence.
How did we hear that? In books and newspapers, what can we find information? Oh no! Mishaps! A rising global public health problem, according to Agnihotri and Joshi (2006), is the number of injuries and fatalities caused by road traffic. Developing nations account for a disproportionate share of the world's road traffic injuries, according to Banthia et al. (2006).

When compared to passengers in cars, motorcyclists have a sixteenfold higher risk of death and a threefold higher risk of injury in the event of a collision (Branas and Knudson, 2001). In a motorbike accident, unlike in a vehicle collision, the rider often takes the brunt of the impact's compressive and kinetic forces (Janmohammadi et al., 2009). There has to be a worldwide effort to avoid road traffic injuries since they are a big but underfunded public health concern. Road transport is the most complicated and risky system that individuals encounter every day, according to the World Health Organisation (2004). Every year, road traffic accidents claim the lives of almost 1.2 million people and injure an estimated 50 million more (WHO, 2004).Tragedies involving these personalities often get less coverage in the media compared to other, less common, but more unique kinds of tragedies. Worldwide, traffic-related fatalities and injuries are projected to surge by 65% from 2000 to 2020 (Kopit and Crooper, 2005; Murray and Lopez, 1999), with estimates indicating an even steeper increase of up to 80% in low- and middle-income nations. This necessitates stepping up existing efforts and launching brand-new ones in order to contain the threat.
How is the Bolgatanga Municipality in Ghana, a developing nation, handling motorbike registrations and accidents? In this term paper, the researcher hopes to answer this question.

1.2 Problem Statement

Afukaar et al. (2003) found that most road traffic fatalities and injuries occurred in rural parts of Ghana, and that road traffic collisions were the predominant cause of deaths and injuries on these routes. According to the Bolgatanga Municipal Health Administration Annual Reports (2008, 2009), the region's road traffic accidents have been a leading source of OPD visits and hospital admissions since 2006. The number of fatalities caused by traffic accidents in Africa is projected to rise from 59,000 in 1990 to 144,000 in 2020, a 144% increase (Nantulya and Reich, 2002).
The Bolgatanga Municipality is located in Ghana's Upper East Region, and this thesis aims to investigate motorbike registration and accidents within that area.

1.3 General Objective

The main objectives of the study are to looks at motorcycle registration and motorcycle accidents in the Bolgatanga Municipality.

1.3.1 Specific Objectives

- To determine the trend of registered motorcycles between 1980 and 2017
- To determine the trend of motorcycles accidents between 1980 and 2017 in Bolgatanga municipality.
- Develop a suitable time series forecasting model for number of motorcycle registration and accidents cases in Bolgatanga Municipality over the period 1980 - 2017 and use it to estimate 4 years forecast.
- To determine the factors contributes to causes of motorcycle accidents in Bolgatanga Municipality.
- To determine the relationship between total number of license issued and motor accidents.

1.4 Research Questions

- Is there a trend of the registered motorcycles between 1980 and 2017 in the Bolgatanga Municipality?
- Is there a trend of motorcycle accidents between 1980 and 2017 in the Bolgatanga Municipality?
- What is suitable time series forecasting model for number of motorcycle registration and accidents cases in Bolgatanga Municipality over the period 1980 - 2017 and use it to estimate 4 years forecast.
- What factors causes motorcycles accidents in Bolgatanga municipality?

 What is the relationship between total number of license issued and motor accidents?

1.5 Significance of the Study

The results of this research on motorcycling in the Northeastern United States would be available to the general public. This information would be useful for M TTU and the Ghana Highways Authority in deciding whether to expand or maintain the current road infrastructure.
Policymakers and influential citizens in the region might benefit from this study's findings about the factors that contribute to motorbike accidents. With this information, they may potentially create policies that address these reasons, reducing the likelihood of traffic accidents in the Municipality and beyond.
The research will inform the road safety commission on the patterns of motorbike arrivals to the area and the factors that contribute to motorcycle accidents. If the commission had more information on the number of motorbikes on the road and what causes accidents, it might better tailor its future road safety campaigns.
This work may be used as a reference for students and scholars who want to go more into this field. In conclusion, the research would help fill in the gaps in our understanding of the problem by building on prior research. Furthermore, this study will serve as a foundation for future investigations into incidents involving motorbikes in the Eastern Region.

LITERATURE REVIEW

EARLIER FORECASTING MODELS OF ROAD TRAFFIC ACCIDENTS

The investigation of road accidents has been the subject of groundbreaking work by several scholars, one of them is Smeed (1949). In 1938, Smeed used the following format to analyse the correlation between different road fatalities, motor vehicle deaths, and population sizes in 20 countries:
The ratio of fatalities to the total population (D/N) is equal to 0.0003 times the ratio of the number of car accidents (N/P) to 0.67. Jacobs and Cutting (1986) replicated Smeed's work by analysing deaths in developing nations over many years; they found strong correlations between vehicle ownership and death rates. Using data from 20 developing nations, the study was performed for 1980 and the following connection was derived:
You can calculate the ratio of D to N as follows: D/N=0.00036(N/P)0.65 (2)
Andreessen (1985) strongly questioned the correctness of Smeed's findings about the models used. 9 It is not possible to apply Smeed's methodology to every country, he said. The fatality model that Andreessen developed in 1985, which is comparable to Smeed's equation, has the following form:
Calculation of fatalities: 0.000112(population) x 0.73259(number of vehicles) x 0.33293 (3)
Mekky (1985) examined the consequences of a quick rise in motorization levels on mortality rates in a number of emerging nations using the same time series data. The following equation was proposed by Kim (1990), a Korean researcher who created a comparable model:
The formula for death toll is 0.251414=0.25451(population)/0.699196(number of vehicles) (4)
Two types were suggested for Malaysia. By the year 2000, 4950 fatalities were predicted by Aminuddin (1990) using a simple linear model. On the other hand, Rehan (1995) enhanced Aminuddin's model, proposed a model comparable to Smeed's, and obtained the following equation:
Killings=0.08193(Population x Vehicles) 0.335 (5)
Partyka (1984) created basic models using demographic and employment statistics to investigate the causes of the rising number of accidents in poor nations. Fieldwick and Brown conducted the research on how speed restrictions affect traffic accidents (1987). Researchers in both urban and rural regions discovered that speed restrictions significantly impact road safety. In 1987, Minter created a model to estimate the number of road accidents in the United Kingdom after discussing how to apply the two models (Wright and Towell) to issues related to road safety. Pramada and Sarkar (1993) looked examined how the frequency of traffic accidents varied among India's union

territories. When it comes to road accident casualties and other pertinent numbers for Zambia, Emenalo et al. (1987) laid out the trend 10 curves. With the inclusion of road length as a new component, Pramada and Sarkar (1997) once again created a model for road accidents. To predict the number of people killed in road accidents in Yemen, Ameen and Naji (2001) laid forth a generic modelling approach.

2.2.0 TIME SERIES AND OTHER STATISTICAL MODELS USED IN RTA

Many cross-sectional studies have used statistical analysis and model construction to examine correlations between variables and traffic accidents over the course of many years. These research have varied in size and scope. For the purpose of modelling the mortality rates and total number of fatalities in a given population, multiple regression and Poisson regression are often used. On the other hand, Pococket et al. (1981) noted that when trying to simulate death rates across regions with differing populations, unweighted multiple regression does not work. To add insult to injury, completely weighted regression is often overkill. They came up with a middle ground method for mortality rate modelling using maximum likelihood. Motor vehicle mortality in Taiwan from 1974 to 1992 was studied by Tsauo et al. (1996) using vital statistic data. The researchers looked at the impact of age, time of death, and birth cohort. In order to fit the model and perform the impacts of variables, log-linear regression was used. Using linear regression with logarithmic transformation, Kardara and Kondakis (1997) analysed the rates of fatalities and injuries caused by road traffic accidents in Greece from 1981 to 1991. By using a spatial autocorrelation corrected regression model and performing the logarithmic transformation for the injury rates, LaScala et al. (2000) investigated relationships between demographic and environmental factors and pedestrian injury rates. Using accident data from 1967 to 2000 in the UK, Evans (2003) used statistical modelling to estimate the fatal accident rates in road traffic and railway accidents. Furthermore, using data from Vital Statistics records and the provincial health registry, Lix et al. (2004) utilised Poisson regression to examine the relationship between demographic, geographical, and temporal explanatory variables and mortality in various regions of Manitoba, Canada, from 1985 to 1999. Based on data from death certificates, Yang et al. (2005) used Poisson regression modelling to analyse and compare injury-related mortality rates by age and sex in Guangxi Province, South Western China, in 2002. Nevertheless, the scope of this investigation was somewhat limited.
Several researchers have begun to analyse data on traffic accidents using time series techniques like ARMA, ARIMA, DRAG, and state space or structural models in order to better predict accident variables. This is due to the fact that ordinary (regression) methods have issues with the assumption that the observations over time are independent.
In 2005, Abdel investigated vehicular accidents in Kuwait. To predict how many people will die in Kuwait, he contrasted ANN with an ARIMA model. In cases of long-term series devoid of seasonal variations in accidents or autocorrelation components, he came to the conclusion that ANN performed better. Based on RTI data collected in China between 1951 and 2003, Wen et al. (2005) developed a methodology for RTIs. We used ARIMA models to develop a set of RTI prediction equations. They came to the conclusion that the time series models that were set up in this way are very helpful for RTI prediction. For their 2004 study, Cejun and Chiou-Lin used the Holt-Winters (HW) algorithm and the Arma time series approach to forecast the number of people killed in car accidents each year. They reasoned that compared to the results produced by the HW algorithm, the ARMA models' predictions were somewhat greater. Similarly, Ayvalik (2003) examined the effects of a policy shift on Illinois's mortality rates and trends using intervention analysis using the univariate Box-Jenkins technique. In an attempt to provide a hand in the formulation of policies aimed at lowering the mortality rate in Illinois, he created the ARIMA forecasting model to predict future trends in highway fatalities.

2.1 Registered Vehicles

The municipality recorded 15,475 vehicles between 2004 and 2008, with 98% of them being motorbikes. Appendix A displays the yearly breakdown of registered automobiles. From 2004 to 2008, the number of vehicles registered

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rose, according to the data. From 2004 to 2008, the number of automobiles registered in the Upper East Region was In 2006, there was a surge of almost 100%, and in 2007, there was a surge of 38%; 2005 and 2008 saw lesser rises of around 2% and 5%, respectively. In contrast, the pattern of vehicle registrations showed a fluctuating growth of 54% from 2005 to 2006, 35% from 2007 to 2008, and 14% from 2008. Vehicles on motorcycles outnumbered vehicles by a substantial margin during the research period ($t(0.025, 4) = 4.127$, $p=0.015$). While they only constituted 0.6 percent of total vehicle miles travelled in 2015, motorcycles made up 3% of all registered cars in the US. Table 2 shows that in 2015, the rate of fatalities for motorcyclists was six times higher than the rate of fatalities for passengers in passenger cars. Motorcyclists had a somewhat lower injury rate (1,028) compared to passengers in passenger cars (1,035). In 2015, the fatality rate for motorcyclists was about 29 times higher than that of passenger car occupants in traffic accidents, while the injury rate was nearly 5 times higher. less seriously injured than those riding shotgun in passenger cars (1,035). In 2015, the fatality rate for motorcyclists was about 29 times higher than that of passenger car occupants in traffic accidents, while the injury rate was nearly 5 times higher.

Table 1 Occupant* Fatality Rates, by Vehicle Type, 2014 and 2015

Fatality Rate		Vehicle Type						
		Motorcycles		Passenger Cars		Light Trucks		
		Fatality Rate	Injury Rate	Fatality Rate	Injury Rate	Fatality Rate	Injury Rate	
2014	Per 100,000 Registered Vehicles	54.58		1,088	9.11	985	7.37	633
	Per 100 Million Vehicle Miles Traveled	23.00		459	0.86	93	0.69	60
2015	Per 100,000 Registered Vehicles	57.85		1,028	9.48	1,035	7.70	630
	Per 100 Million Vehicle Miles Traveled	25.38		451	0.89	97	0.72	59
*Occupants include both riders/drivers and passengers. Sources: Fatalities – FARS 2014 Final File, 2015 ARF; Injured – NASS GES 2014-2015; Vehicle miles traveled and registered motorcycles – FHWA; Registered passenger cars and light trucks - Polk data from R.L. Polk & Co., a foundation of IHS Markit automotive solutions.								

The modelling of dependent, sequential observation has widely used time series analysis since the work by Box and Jenkins (1976). If you want to understand how stochastic and dynamic systems behave, there are two helpful representations: the autoregressive (AR) and the moving average (MA) (Box et al., 1994). Theoretically sound, straightforward, and applicable to both stationary and non-stationary time series, as well as those with and without seasonal components, time series analysis has proven to be the most effective forecasting model thus far (Karlaftis and Vlahogianni, 2009; Lim and McAleer, 2002). Air transportation (Inglada and Rey, 2004), safety concerns (McLeod and Vingilis, 2008), freight and transportation demand modelling (Batchelor et al., 2007), and air quality and transportation emissions (Lau etal., 2009) are just a few examples of the many areas of transportation management that have made extensive use of this method.

One way to look of intervention analysis is as a kind of stochastic model that extends the ARIMA family of time series models; it uses transfer functions. Concerning intervention, this kind of analysis has been used to examine the effects of extraordinary external events such as natural catastrophes, changes in political or economic policies, innovations in technology, labour strikes, promotional sales, advertisements, and similar events (Liu, 2006). When

studying a time series with exogenous variables, Box and Tiao (1975) laid forth a method called intervention analysis. It demonstrates a practical stochastic modelling tool that can represent two separate parts—a term for the underlying disturbance and the set of interventions in the series—and conducts rigorous effect analyses. An analytical framework for assessing the impact of two interventions in Los Angeles—the opening of the Golden State Motorway and the implementation of a new regulation respecting oxidant data—was supplied by a research by Box and Tiao (1975), which pioneered the use of intervention analysis.
Many areas of the social and physical sciences have made good use of the method over the years. Research and academic interest in intervention analysis in air travel demand has remained low, despite the method's extensive documentation in other fields. The U.S. bombing of Libya in 1986, the Lockerbie flight tragedy in 1988, and the Persian Gulf conflict between 1990-1991 were all actions that one research by Coshall (2003) used to evaluate their effects on the flow of U.K. air passengers to various locations. In order to determine how far the United States has come in terms of recovery from the September 11th terrorist attacks on demand for air passenger travel, Lee et al. (2005) used intervention analysis. According to the data, the demand for air passenger transport in the US has not yet recovered after the attacks, although it seems to be rising slowly. For five routes to the US from European hubs (Frankfurt and Paris), Pitfield (2007) used the ARMA with intervention model to analyse the impact of airline alliances on the traffic of individual carriers. Pitfield (2008) used a similar technique to assess the effect of the so-called "Southwest Effect" on traffic and market share on important domestic air routes in the United States, where Southwest had begun service. When considerable intervention was included in the series, the findings demonstrated that SARMA performed better than all other strategies when compared to an intervention model using various methods (Lai and Lu, 2005).
This study aims to examine the Bolgatanga Municipality vehicle registration system via the lens of the ARMA approach's intervention analysis.

2.2 The Trend of Motorcycle Accidents in Ghana

A study done in Ghana by Yankson et al. (2010) found that developing nations have seen a surge in road traffic injuries, which are now the top cause of mortality and disability, along with motorization. Developing nations are responsible for approximately 70% of all road fatalities, according to the second African Road Safety Conference (2011). With 28 and 32.2% of African deaths per 100,000 people, respectively, road accidents are the second leading cause of death for Africans aged 5 to 44. The recent series of accidents in Ghana lend credence to the previous claim. Approximately 10,000 people die in traffic accidents in Ghana each year, with an additional 150 people suffering severe injuries, according to the Chronicle (Monday, August 11, 2008 issue). This tragic loss of life is a great loss for the country.
Seventy percent of those killed in traffic accidents were men, and twenty-eight percent of those casualties were youngsters less than six years old, according to the Global Road Safety Partnership (G R S P). More over 40% of yearly traffic accident deaths are pedestrians, with 21% of those victims being minors less than 16 years old. At the national level, pedestrian accidents accounted for an average of 29% of all incidents (BRRI, 2001). The age group most at risk, including 18% of all injuries, was children aged 6 to 10.
Pedestrian accidents accounted for 43% of all fatalities in Ghana in 2010, according to Yankson et al., which is consistent with the trend in many other developing nations. Atubi (2012) analysed 38 research on road accidents, classifying victims according to their mode of transportation.Pedestrian deaths accounted for 41–75% of the total in 75% of the studies, while passengers accounted for 38–51% in 62% of the studies. Without ever coming out on top in any nation, drivers rated third in 55% of the surveys. In India, the number of pedal and motorcyclists killed was highest.
Out of fourteen studies that documented non-fatal injuries, passengers came out on top. Pavements (sidewalks) that allow pedestrians to walk apart from motorised vehicles, particularly at high-risk collision areas, may significantly reduce pedestrian injuries, according to Ameratunga et al. (2006). There is a twofold increase in the probability of an accident when roads do not have pavements, which is typical in many low-

income nations. Another important technique that might reduce fatalities and injuries by 11% is the deployment of road-design features to discourage slower driving via different traffic-calming measures. A before-and-after study of speed bumps in Ghana revealed a 55% decrease in overall fatalities and a 51% decrease in yearly crashes involving a pedestrian, even though these results from the Cochrane Injuries Review Group did not include any data from low-income or middle-income nations. The researchers went on to say that although developed-world traffic deaths and injuries are on the decline, developing-world figures show a disturbing upturn. According to Arthur Kennedy's "Perishing on the road" piece, which Amoah (2011) quoted, some of our famous politicians, including former presidents Rawlings and Kufour as well as several other important politicians and members of the Ghanaian parliament, have been involved in accidents. To back up his claim that "road accidents kill more Ghanaians annually than typhoid fever, pregnancy related complications, malaria in pregnancy, diabetes or rheumatism," Amoah once again referenced Amofa, the deputy director of the Health Service. He went on to say that the Kumasi–Accra highway tragedy that killed three urologists from the Korle-Bu teaching hospital has left a dark mark on Ghanaians' memories. The numbers of road fatalities in Ghana are very concerning, according to Obour (2011) and Akoto-Manu (2011). There were 1,346 fatalities in 2007, 1,520 in 2008, 1,587 in 2009, 1,760 in 2010, and 2,119 in 2011. Accidents involving vehicles in Ghana are clearly on the rise.
There is an increase in accidents during the holidays, particularly in November and December, therefore drivers should use extra caution, according to the MTTU (2011). The G R S P reports that four people die in traffic accidents every day in Ghana. "The current rate of 1800 deaths through road accidents is unacceptable," said Ghana's vice president Mahama, according to the Herald newspaper's November 21, 2011 issue. As the chronicle reported on Monday, August 11, 2008, Akorsah made the widely-recognized assertion that "the most deadly disease in Ghana at the moment is motor accidents," adding to the terrifying scenario.

2.3 Causes of Road Accident (motorcycle)

Numerous studies have examined car accidents in Ghana and other countries, and their causes, consequences, and solutions have been proposed. For instance, Ayeboo (2009) found that several factors, such as drivers' intoxication, improper lane changes, inadequate road infrastructure, and rickety automobiles, contribute to the high frequency of accidents on our roadways.
In addition, more than twenty causes of road accidents in Ghana have been identified by the National Road Safety Commission (NRSC). These include drivers' lack of judgement, inexperience, carelessness, inaccurate overtaking, recklessness, intoxication, overloading, machine failure, dazzling and defective light, boredom, drivers' unwillingness to dismount from moving objects (such as vehicles, motor cycles, humans, and animals), defects in the road surface, level crossings, and obstructions. Corruption, non-compliance with traffic rules and regulations, using mobile phones while driving, and not wearing a seat belt are further issues (National Road Safety Commission, 2007).
Notwithstanding these considerations, Ocansey (2011) found that drivers' eyesight may be a significant role in traffic accidents. Most of the elements mentioned above have not been evaluated using mathematical and statistical tools to determine if they are true or not, therefore it is clear that the real causes causing traffic accidents in Ghana have not been found.
Equipment failure, road design, drivers' behaviour, and inadequate road maintenance are four variables that have been associated with road accidents, either alone or in combination. But research shows that driver error, together with the other three elements, accounts for more than 95% of all traffic accidents (Driving rules, no date). Human factors (road users), road faults, and vehicle problems are the main causes of road accidents in Cambodia, according to the national report on road safety. The survey indicated that the number of traffic accidents in Cambodia climbed by 50% in only five years, with the death rate doubling over that time. A number of steps were proposed to assist lower the incidence of road accidents, including the establishment of a Road Accidents Safety Committee, a system to record incidents, a strategy to evaluate accidents, and training programmes for drivers (Ung Chun, 2007).

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Are road accidents in Ghana caused by witches or careless government practices, despite the fact that some Ghanaians still attribute some of these incidents to superstition, witchcraft, and bad forces? The widespread belief is that witches, wizards, and evil powers cause most people to die in car accidents so that they may collect more blood to use in their rituals. In 2006, Okyere wrote..... The rising toll of road fatalities, particularly in sub-Saharan Africa, has prompted some scholars to blame bribery and corruption. People in Russia were paying up to US800.00 to get a driving licence without attending driving school, according to a research that sought to determine the role of corruption in the country's high road toll ("Russia" Today, 2010).
Proof suggests that South Africa's government spends more than R500 million a year from the Road Safety Fund on anti-corruption initiatives (Arrive Alive, n.d.).
Because the police do not enforce transport laws and the transport ministry and the president's office are at odds with one another, the Kenyan transport sector is rife with corruption, bribery, and bureaucracy (Chitere and Kibua, 2004).
Both Khayesi (1997) and Lamba et al. (1986) found that the majority of public transport staff are hired via personal connections. Accidents involving vehicles have become more common in Kenya as a result of this policy, which has prevented qualified individuals from entering the transportation sector.
There is strong evidence to suggest that the quantity of road accidents relative to a specific time period directly correlates to the number of casualties.
Afukaar et al. (2009) reported 1,779 fatalities and 11,320 injuries in 2005 in a study they submitted to the National Road Safety Commission. In 2007, there were 1,024,038 traffic accidents, resulting in 20,024 fatalities. By the year's conclusion, 2009 had seen 12,299 traffic incidents, resulting in 2,237 fatalities. But there was no model in the paper that could predict how many people will die in road accidents in the next years and how many accidents there would be.
It is worth noting that a research carried out in South Delhi by Kumar et al (2008) indicated that the majority of fatal accidents happened on Saturday. On the other hand, a study in Nepal by Jha and Agrawal (2004) reported that the most road accidents happened on Sunday and the least on Monday.
Interestingly, a research conducted in South Africa revealed that the highest number of fatalities caused by vehicle accidents happened on Saturdays (20.8%), followed by Sundays (17.1%). (The Injury and Mortality Monitoring System, 2005)
According to Kumar et al. (2008), 11.04% of Delhi's total fatal accident count happened in November, making it the city's worst month. This conclusion ran counter to what Jha and Agrawal (2004) found in Nepal, who had hypothesised that July was the worst month for accidents there.
Although the National Crime Record Bureau (2005) revealed a greater prevalence of road accidents in May and March in India, a study done in Delhi by Mehta (1968) and Ghosh (1992) indicated that the largest number of fatalities from these incidents happened in January.
Conditions related to road accidents may fluctuate from nation to country, and the fact that different studies have come to different conclusions suggests that it may be challenging to extrapolate from one country's data to another.

2.4 Reasons for not reporting accidents to the police

Most riders do not have licences (about 71%) and will want to avoid the police. Over 70% of participants were also of the view that most of the accidents are caused either by stray animals on the road and foot-paths. One discussant elaborated: “You see, me when I had my accident, it was due to my own mistake. Besides, my motorcycle is not registered. I don't also have a licence, and on top of that, I was not wearing a helmet, so you want me to go and report myself to the police, no way”. (Male Discussant)
Discussants also noted that generally, the social settings of Bolgatanga township discourage litigation. So accidents were usually settled informally. Another participant, a motor fitter (mechanic) noted:
“In Bolgatanga, we are all one big family, so if you have a problem with your family member you don't report to the police. If you do that, the police will collect money from the two of you, why don't you settle it amongst yourself

and use that money to treat yourselves and to repair your motorcycle. So that if there is a balance, you can drink beer with it and pour some to your ancestors for saving your lives". (Male Discussant).

According to the expert opinions of the Senior Nurse In-charge of the accident and emergency ward and the Regional Coordinator of National Road safety Commission, Motorcycle accidents accounts for over 80% of all motorcycle accidents cases in the municipality for the past five year.

2.6 Economic burden of motorcycle accidents

About half, or around US$1.2 million, of the total cost of motorbike accidents went towards administrative and property damage costs, while the other half went towards casualty-related expenses, such as medical bills, out-of-pocket costs, lost labour outputs, intangible costs, and funeral costs. Males in their productive years made up the majority of motorbike accident casualties. A only one-third of the motorbikes possessed insurance. A whopping 71% of the riders lacked a legal driver's licence and were determined to evade authorities. Brain trauma, broken bones, cuts, and bruises were the most common motorbike injuries. The majority of the incidents occurred due to individuals not having had proper training on motorbikes, those abusing alcohol, animals not confined, and donkey carts.

About 51.9% of these expenses are attributable to accidents, whereas 48.1% are attributable to casualties. Damages to property accounted for 47% of the overall accident costs of $585,415.37, while administrative expenses accounted for 5%. A total of US$631,412.32 was spent on casualty-related expenses, with 21% going towards labour production costs, 17% towards out-of-pocket spending, 5% towards hospital costs, 4% towards intangible expenditures, and 1% towards funeral costs.

Some have tried to put a monetary value on the human and societal costs of traffic accidents. An estimated 1% of GDP in low-income nations, 1.5% in middle-income countries, and 2% in high-income countries goes towards paying for injuries sustained in road accidents (Jacobs et al., 2000). Worldwide, road accidents cost an estimated $518 billion in direct economic effects; in low-income nations, that figure rises to $65 billion, surpassing the sum total of development aid received each year. In the year 2000, Jacob and colleagues published... Also, middle-income and low-income nations' projected expenses are likely far lower. Using more thorough data and measuring methods, the yearly costs (direct and indirect) of road collision injuries in the European Union (EU) nations alone, which account for 5% of the world's fatalities, are expected to surpass €180 billion (US$ 207 billion) For example, Murray and Lopez (1996). In 2000, road traffic accidents in the US were estimated to have cost almost $230 billion in human capital (Blincoe et al., 2002).

Keith et al. (2007) reports that in 2004, motor vehicle crashes in Ontario resulted in $18 billion in societal expenditures. The $11 billion in societal expenditures was mostly attributable to the fatalities caused by those crashes. The $4 billion cost of casualties and the $2 billion cost of property damage were also substantial. Tow trucks, traffic jams, out-of-pocket medical expenditures, hospitalisation, and emergency medical services (e.g., fire, ambulance, and police) all add significantly to the societal costs associated with automobile accidents. Medical expenses for transportation-related injuries in urban areas were estimated to be $100.05 (plus or minus $228.80), while in rural areas they were $21.09 (plus or minus $64.31), according to a study on traffic accident patterns in Ghana and their control implications (Afukaar et al., 2003). Without factoring in production, property, and the human cost of pain, sadness, and suffering, the research only offered the total cost of hospital treatment per injury.

Accurately estimating the monetary impact of road traffic accidents in Africa is obviously just as challenging as collecting accident data itself. Challenges include under-reporting and the fact that various nations use different standards, for example, to determine what constitutes a death in a road traffic accident. Death is defined differently in different nations; some consider it to have occurred at the site, while others wait at least one day, three days, or thirty days after the incident.

In 2007, the Coalition for Road Safety surveyed the peri-urban middle-income neighbourhood of MukhKampul in Cambodia to determine the impact of road traffic injuries on households in least developed countries (Ericson, 2008).The research showed that RTAs had a detrimental effect on MDGs 1, 2, 3, 4, and 5. Results showed a 45

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percent short-term drop and a 68 percent long-term drop in the pre-accident income of the households he studied. While 88% of the women spent time caring for the wounded, 14% of the households polled said their children dropped out of school.
More than twice the statewide incidence of 30 fatalities per 1000 live births, the studied home had a child mortality rate of 71 per 1000 live births, according to the source. Individual urban and rural households in Bangladesh and Bangalore, India were examined in a study conducted by the Transport Research Laboratory (TRL) for the Global Road Safety Partnership (GRSP) that examined the direct economic impact of road traffic crashes resulting in death or serious injury (Global Road Safety Partnership, 2002). The research found that even if only one family member is hurt in a car accident, the whole home might feel the effects. Loss of a breadwinner or a significant percentage of the household's income, as well as burial expenses and missed work time, are costs to families. Borrowing money to cover funeral expenses or missed wages is a common way for grieving families to end up in debt. According to the same source, when a family member sustains a serious injury in a car crash, there are a lot of expenses that come with it. These include medical bills, the time and money spent on finding new, lower-paying work, the cost of long-term care and rehabilitation, and the value of the carer's lost earnings. In fact, most families with a serious injury had to put at least one family member out of work to take care of the injured. A large percentage of low-income families (more than 60%) took out loans to cover expenses.
There are many ways in which a country's economy suffers when its citizens die; however, the loss of educated and skilled people whose work boosts national output is a particularly devastating blow. An example of this occurred on August 27, 2005, when three urologists from Korlebu Teaching Hospital were killed in a car crash on the Accra–Kumasi route. Considering that there were only seven urologists in Ghana when the incidents occurred, the enormous expense of their training is little compared to the suffering and, likely, death, that patients would experience as a result of their absence. The impoverished and the defenceless bear the brunt of car accidents, according to research. Policy choices are often not impacted by these individuals either (Nantulya and Reich, 2002; Laflamme and Diderchsen, 2002). According to research by Laflamme and Diderchsen (2002), the risk is higher for children from low-income households even in nations with a high per capita income. Most victims are low-income, and they won't have someone to turn to for help if they suffer a long-term disability. There is a lack of post-crash emergency medical treatment for lower socioeconomic groups (Mock et al., 1997). Also, many families in developing nations fall into poverty because of the high expenses of long-term medical care, burial expenses, and income lost because of disability or the death of a breadwinner (Hijar et al., 2003). Accidents involving motor vehicles are the second leading cause of child orphanage in Mexico (Hijar et al., 2003).
People from lower socioeconomic backgrounds are more likely to be injured or killed in road incidents in developing nations. This is especially true for walkers and riders of motorised two-wheelers (Nantulya and Reich, 2002). In many areas, inexpensive transit is riskier than private cars, putting them at a higher risk of harm.

2.7 Motorcycle accidents-A public health concern

There has to be a worldwide effort to avoid road traffic injuries since they are a big but underfunded public health concern. The World Health Organisation (2004) states that, out of all the systems that individuals encounter every day, vehicle transport is the most intricate and risky. Every year, road traffic collisions claim the lives of almost 1.2 million people and injure an estimated 50 million more. in 2004. (WHO).Compared to other, less common but more exceptional tragedies, the one involving these personalities usually gets less coverage in the media.
Even worse, estimates show that traffic-related fatalities and injuries will climb by 65% globally from 2000–2020 (Kopit and Crooper, 2005; Murray and Lopez, 1996), with increases of up to 80% predicted in low- and middle-income nations.At this time, "vulnerable road users" such as walkers, bicyclists, and motorcyclists account for the vast majority of these fatalities. Even while automobile accidents still account for the vast majority of fatalities in high-income nations, poor road users confront disproportionately high risks on a per-capita basis. According to Peden et al. (2004). The number of fatalities caused by traffic accidents in Africa is projected to rise from 59,000 in 1990 to 144,000 in 2020, a 144% increase (Nantulya and Reich, 2002).In contrast, there has been a declining

tendency in industrialised nations since the 1960s. Worldwide, the public health concern was only addressed after a long time as road traffic injuries were thought to be unavoidable and due to random, unexpected incidents. In April 2001, the World Health Organisation (WHO) convened a consultation conference. The meeting's outcomes were documented in a report titled "A 5-year WHO strategy for road traffic injury prevention" (Peden et al., 2004). In an official statement highlighting the worldwide public health burden of road traffic injuries and asking Member States to address the problem, the United Nations Secretary-General raised the alarm in 2003 (United Nations General Assembly, 2003). In low-income nations, where a lack of information might prevent resources from being allocated effectively, one suggestion is to encourage and support study on the topic. In the case of motorbike accidents in particular, a lot more work is required.
In 1996, the World Health Organisation estimated that road traffic injuries received between $24 and $33 million in research and development funding, whereas HIV/AIDS received over $900 million (WHO, 1996). A large chunk of the sum also ends up in wealthy nations (Lagarde, 2007). Low- and middle-income nations account for the vast majority of road fatalities (85%), disability-adjusted life years (90%) and children killed (96%) on a global scale. People between the ages of 15 and 44 account for more than half of all fatalities (Peden et al., 2002). Worldwide, injuries sustained in automobile accidents rank second among both children and youths (Peden et al., 2002).

Research methods

3.1 Research Design

A cross-sectional survey data collection approach and quantitative design was used in the study to examine the perception of the public about the motorcycle accidents in the municipality. A cross sectional survey method employed to solicit for primary data from respondents. A desk-top research was used to obtained secondary data involving other people views regarding the study area.

3.2 Population

3.2.1Target population

The target population refers to the population of interest for the purpose of the study and it was defined as motorcycle accidents victims in Bolgatanga Municipality. The accident victims' opinions were solicited to know the causes of motorcycle accident in the municipality.

3.2.2 Sample Frame

The sample frame consists of the list of element from which the sample is actually drawn. It was made up of the list motorcycle accidents cases which were collated from the regional hospital of the Upper East Region.

3.2.3 Sample Size

Saunders *et al*. (2007) indicated that, the size of the sample and the way in which it is selected will definitely have implication for the confidence you can have in your data and the extent to which you can generalize. The sample size of the motorcycle victims was determined using the 2,353 RTA cases in 2015. Using expected motorcycle accident rate of 80% of all RTA cases, and 74% worst acceptable results (absolute precision of 6%) at confidence level of 95%, a sample size of 160 was calculated using Epi-Info Version.

3.3 Sample and Sampling Procedure

Motor cycle accident victims: Motor cycle accident victims were purposively sampled from the Bolgatanga

Municipality. From the 2008 Annual Report of the Municipal Health Administration, a total of 2353 people were involved in motorcycle accidents (i.e. 2034 cases at OPD and 319 In-patients). Initial attempt was made to select RTA cases randomly, however, due to unreliable house numbering system in the Municipality, coupled with the tendency for accident victims to provide false house addresses for fear of being tracked by the police, it was extremely difficult to reach the motorcycle accident victims using the house addresses obtained from the police and hospital sources.Thus, after identifying some willing victims to participate in the study, the Snowball technique was used to obtain the sample size from motorcycle repairers, traditional bone setters and the Accident and Emergency Ward record.Data on all registered motorcycle ranged from 1980 to 2017 were collected. Police record of motorcycle accidents within the study period was also collated.

3.4 Data Collection Instruments

A questionnaire was the instrument used for the collection of primary data for the study. A Set of questionnaires containing a 30 items was designed for the respondents of the Bolgatanga Municipality. In this study, a semi-structured-questionnaire was used as the primary research instrument. The questionnaires included most closed-ended questions (pre-coded) to make simpler for the respondents and also for easy analysis. Others are also open-ended to allow accident victims to provide further and better details about their experienced of motorcycle accident. The nature of the study was explained to respondents, and respondents' confidentiality of any information provided was also assured. Respondents were also provided with detailed instructions as to how the questionnaires would be completed and returned. The rationale behind providing clear instructions and assuring confidentiality of information is based on the fact that this significantly reduces the likelihood of obtaining biased responses (Sekaran, 2003). Also journals and publications were used to solicit other people view and opinion about motorcycle registration and accident and the progress made so far.

3.5 Data Collection Approach

Data were obtained from two sources that are primary and secondary and the details are below:

3.5.1 Primary Data Extraction

The study involved the collection of both primary and secondary data. The primary data were collected using structured interviews and administration of questionnaires to obtain information about causesof motorcycle accidents.

3.5.2 Secondary Data Extraction

Data extraction forms were developed to extract secondary data from the records of the regional office of Driver and Vehicle Licensing Authority (DVLA). The data extracted from DVLA records were year/months of registration of motorcycle from 1980 to 2017. Treated accident cases (both in-patient and out-patient cases) were also obtained from hospitals.Data on all registered vehicles from 1980 to 2017 were collected from the Vehicle Registration Log Books of the Drivers and Vehicles Licensing Authority of the Upper East region. Police records of motorcycle accidents within the study period were also collated. Other materials were obtained through reading of journals, publications and articles to enable the researcher assess other perceptions from different stakeholder about the motorcycle registration and accident in the Bolgatanga Municipality

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3.6 Data Analysis

The data was analyzed to predict the pattern of inflow of motorcycles and accidents in the Bolgatanga Municipality between the periods of 1980 to 2017. Various statistical software such Minitab and Grete were used to analyzed the secondary data and the model identified was ARMA(1,0) or ARIMA(1,0,0) and later it was used to forecast for four years period ranging from 2018 to 2022. The primary was analyzed using Statistical Package for Social Solution (SPSS 16.0). In order to aid effective discussion, the responses were put into cross-tabulation with frequencies and percentages.

RESULTS AND ANALYSIS

In this study, results refer to the outcome of the various statistical procedures used in analyzing the data collated and coded. The results served as the foundation for interpretation, discussion and drawing conclusion for the purpose of achieving the objectives.

Motorcycle Accidents

The cross tabulation considered the situations where you own a motorcycle and have an accident with the motorbike or you are not on a motorcycle and been hit by a motorist or car.

Table 4.1: Motorcycle Accidents

		do you own a motor bike		Total
		Yes	no	
have you ever had an accident	Yes	35	11	46
	No	2	2	4
Total		37	13	50

(Filed data, 2016)

From table 4.1; 35 of the respondents said they own a motor bike and had an accident, thus 70 percent of the respondents whiles 11 of the respondent said that, they didn't own a motor bike neither do they had an accident.

Table 4.2: Causes of accidents

		have you ever had an accident		Total
		yes	no	
if yes, what was the cause of the accident	hit the back of a vehicle	2	0	2
	hit by vehicle	13	2	15
	knocked a pedestrian	6	0	6
	knocked an animal	6	0	6
	hit the pavement	7	0	7
	hit by a motor bike	11	0	11
Total		45	2	47
if no to q10, what is your opinion about motor cycle accident	Drunk whiles riding	1	1	2
	Disobedience of traffic regulations	0	1	1
	Over speeding	1	2	3
Total		2	4	6

Even though 2 of the respondents said they never had an accident but they were hit by motor vehicle which made up cases of hit by vehicle to be 15. Also 4 of the respondents believed that, motor accidents are caused by over speeding, disobedience of traffic regulations and drunk whiles riding. For instance, Ayeboo (2009), identified that

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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.

Table 4.3: Accident Scene

		which one of the following describes you at the time of the accident			Total
		rider	pedestrians	pillion	
when did the motor bike accident occur	less than one month	6	3	0	9
	between 1-6 months ago	15	1	2	18
	6-12 months ago	9	0	1	10
	more than one year	11	1	0	12
Total		41	5	3	49

From table 4.3, most of the accidents that occurred people were not sitting at the back, only 6.1 percent of the respondents were seated at the back at the time of the accident . Also 15 of the respondents were riders at the time of the accident which they said the accident occurred between 1-6 months ago before the time of the study.

Table 4.4: Number of Respondents who report accident cases to the police

		have you ever had an accident		Total
		Yes	no	
did you report to the police	Yes	7	2	9
	No	39	1	40
Total		46	3	49

(Filed data, 2016)

Out of 46 respondents, 84.8 percent of them, have ever had an accident but never reported to the police about the accident. Two (2) of the respondent who said they have ever had an accidents were probably eyewitness of the motor accident and did reported to the police.

Table 4.5 Reasons for not reporting to the police

Reasons	Number of Respondent	Percentage (%)
could not identify the person	15	30.0
think is not necessary	14	28.0
fear of punishment	10	20.0
Far from police station	1	2.0
Fear of paying money	10	20.0
Total	50	100.00

(Filed data, 2016)

Respondent were asked to state their reasons for not reporting to the police. Out of the 50 respondents, 30% said could not identify the person, 28% indicated thought it was not necessary to report to the police, 20% thought of punishment , 2% said distance and 20% believed when they report to the police, they would demand for money.

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Table 4.6 impact of accident on working ability

		what has been the impact of the accident on your working ability			Total
		can still work	working ability reduced	cannot work at all	
have you ever had an accident	Yes	28	14	2	44
	No	2	0	0	2
Total		30	14	2	46

(Filed Data, 2016)

Out of 44 respondent, 28 of the respondents said they have ever had an accident but they can still work whiles 14 of the respondents indicated that their working ability has reduced but only 2 of the respondents admitted to the fact that, they cannot work at all.

Table 4.7: Economic burden

		did you have to sell any property to take care of yourself as a result of the accident		Total
		Yes	no	
have you ever had an accident	Yes	9	36	45
	No	1	1	2
Total		10	37	47

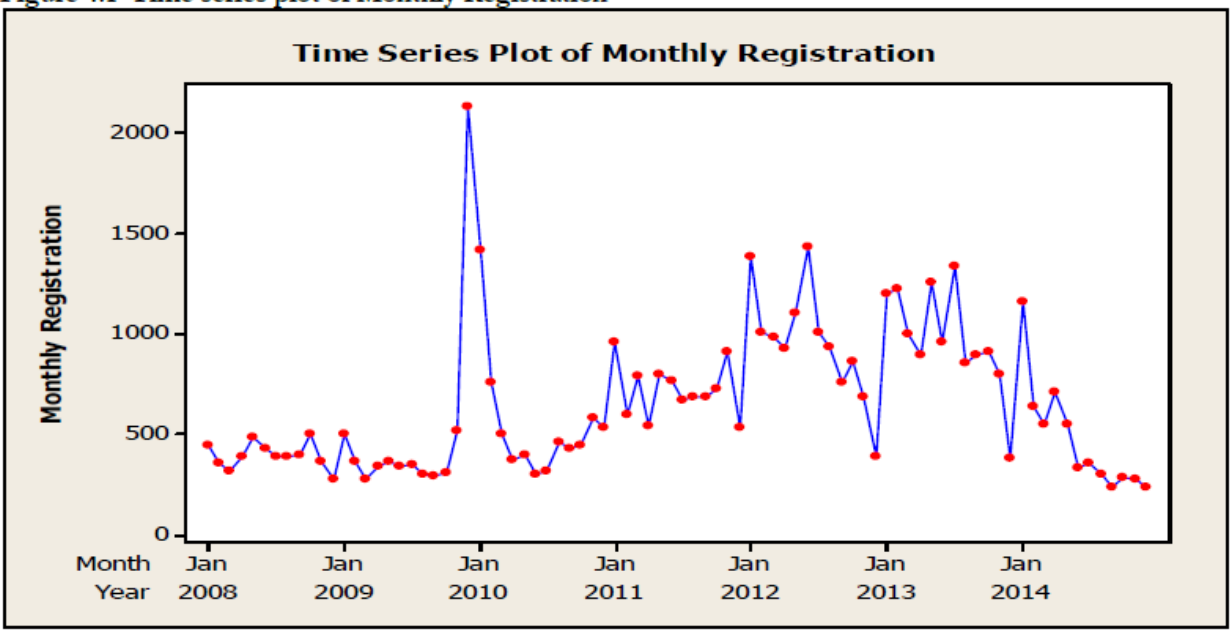
(Filed Data, 2016)

Nine (9) of the respondents agreed that, they had an accident and sold properties. However, only one (1) respondent said s/he never had an accident but solved a property probably to support an accident victim.

4.2: Time series analysis motorcycle registration

The study analyzes the number of motorcycle registered in the Bolga Municipality within the period of 1980 to 2017. In all about 71,777 motorcycles were registered within this period.

Figure 4.1 Time series plot of Monthly Registration



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(Filed Data, 2016)

From the plot it can be observed that there are similarities that exist within the months of the year. It can be seen that from the month of January through to July thereabout, the registration keeps reducing and starts rising again from the month of October and then reduces to December.

Table 4.8: shows stationary test (raw data)

ADF	KPSS
$Pd = 0.000574$	$Pd = 0.467$
$p - value = 0.05$	$p - value = .467$

(Filed Data, 2016)

Penalty is less than 0.05 which indicates motorcycle registration data is stationary.

Table 4.9: shows accuracy measures

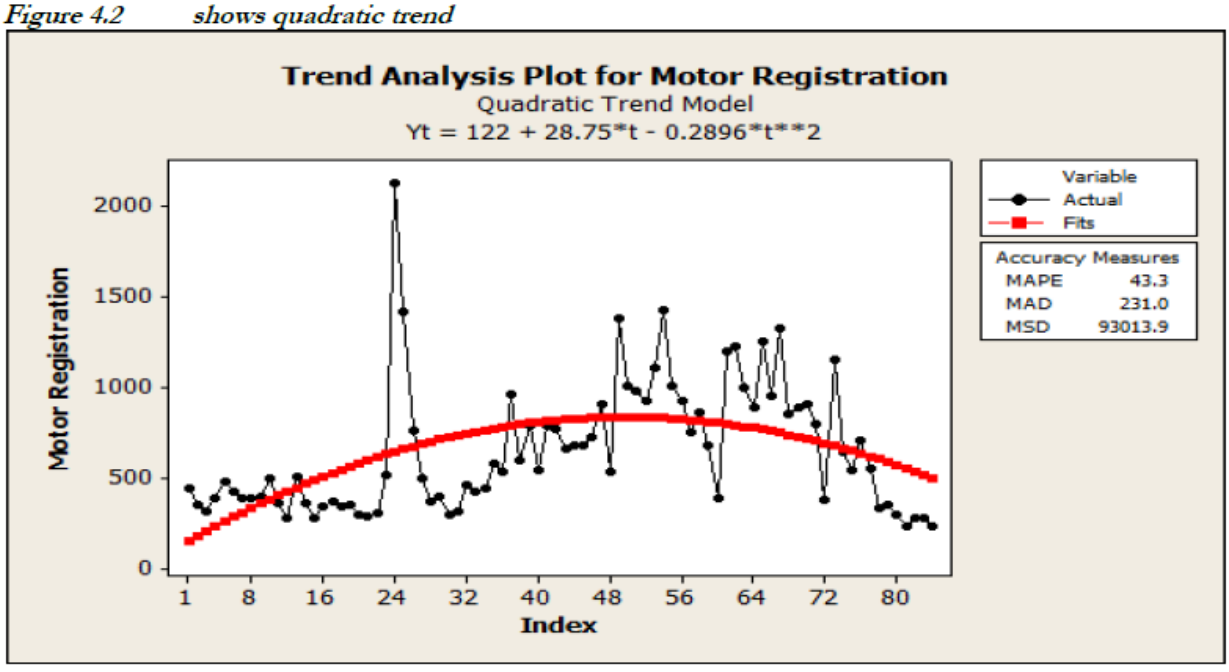
	ACCURACY MEASURES		
Trend	MAPE	MAD	MSD
Linear	48	251	116201
Quadratic	43.3	231	93013.9
Exponential	42	250	123926

(Filed Data, 2016)

From the table 4.9, it can be observed that, the registration of motorcycle in the municipality exhibit quadratic trend since it has the lower MAPE, MAD and MSD.

Comparing the measures of accuracy from table 4.9, it can be observed that, quadratic trends assumed the least values and it is clear that, motorcycle registration follows quadratic trend hence, the details are shownbelow

Figure 4.2 shows quadratic trend



(Filed Data, 2016)

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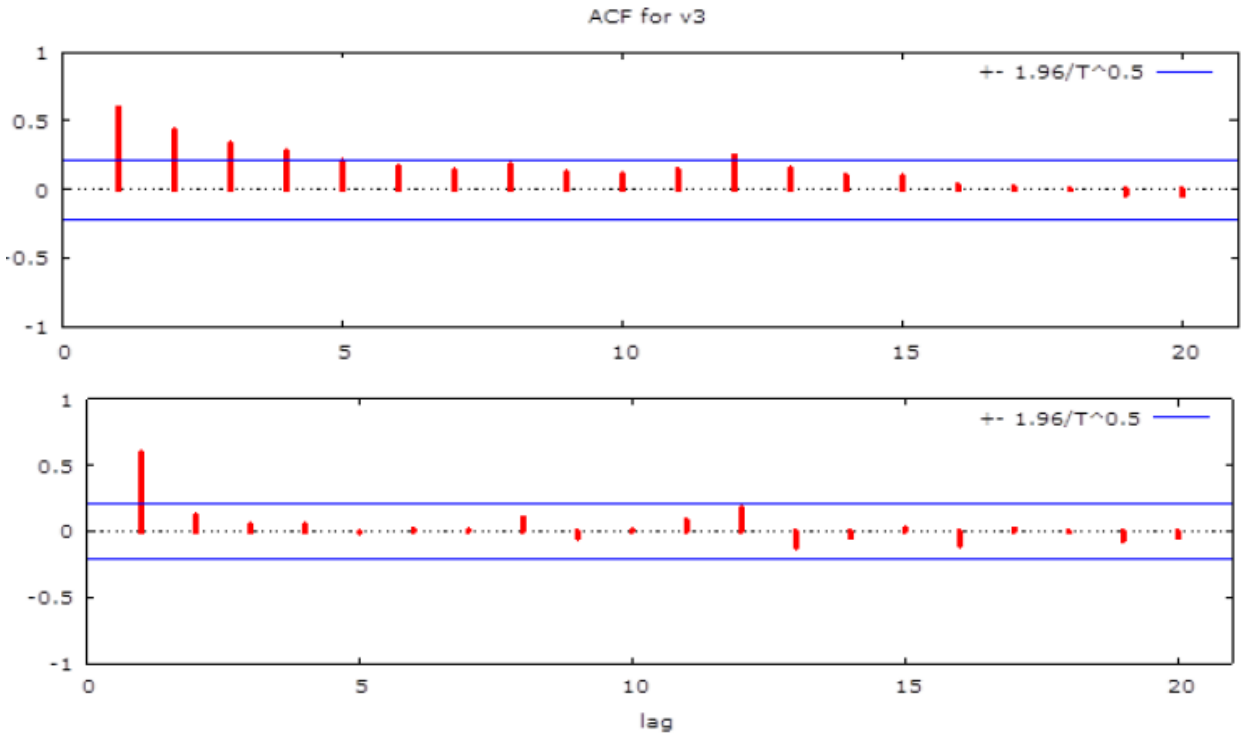
The time series plot in figure 4.2 exhibits quadratic trend. The graph exhibits that, motorcycle registrations are random data in the Bolgatanga Municipality.

Figure 4.Shows ACF and PACF



(Filed Data, 2016)

The ACF graph shows there is periodicity at lag 12. Lag 1 to lag 4 is said to be significant. To further ascertain the behaviour of the series data on motorcycle registration, the PACF graph is plotted above. Apart from lag one (1) in the PACF graph above, the others are all within the confined of the confidence limit.

Table 4.10: shows Model identification

From the ACF and PACF plots the following were model were identified.

Model	AIC	BIC	HQC
ARMA(1,1)	1193.861	1203.584	1197.770
ARMA(2,1)	1195.322	1207.477	1200.208
ARMA(3,1)	1197.259	1211.844	1205.122
ARMA(4,1)	1199.498	1216.514	1206.339
ARMA(1,0)	1193.652	1200.944	1196.583

(Filed Data, 2016)

From the penalty statistic table the model with the least AIC, BIC and HQC is ARMA $(1,0) = ARIMA(1,0,0) = AR(1)$.

Table 4.11: shows Adequacy test (ARCH-LM Test)

Lag	P-value
12	0.998809
24	0.873715
36	0.436489

(Filed Data, 2016)

From the table 4.11 adequacy test values are greater than 0.05 at the various lags confirmed that, ARMA (1, 0) is Adequate

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Table 4.12: Shows Ljung Box Statistic

Lag	12	24	36	48
X^2	8.4	12.7	25.5	33.4
DF	10	22	34	46
P-value	0.589	0.942	.863	0.916

(Filed Data, 2016)

From the adequacy test the ljung box statistic indicates that, the data is free from higher auto-correlation since the p-value is greater than 0.05 at various lags (12, 24, 36, 48). Also from the ARCH-LM test the registration data is not heteroscedastic since the p-values at the various lags is greater than 0.05. Hence the data is homoscedastic.

The model is ARMA (1,0)

The estimator model is y= 648.889+.449633Q1

Table 4.13: shows forecast values for 2017.

	95%		
Period	Forecast	Lower	Upper
January	639.41	-69.39	1348.21
February	639.66	-69.14	1348.46
March	639.81	-68.99	1348.61
April	639.9	-68.9	1348.71
May	639.96	-68.84	1348.76
June	639.99	-68.81	1348.8
July	640.01	-68.79	1348.82
August	640.03	-68.78	1348.83
September	640.03	-68.77	1348.84
October	640.04	-68.76	1348.84
November	640.04	-68.76	1348.84
December	640.04	-68.76	1348.85

Total Registration for 2016=7053.92 and 2017=7678.92 from projections

Table 4.13shows the forecast for 2017 is fairly steadily increasing pattern. That is from January, 2017 to December, 2017 respectively. There is also the lower confidence level (LCL) and upper confidence (UCL) all ranging from January, 2017 to December, 2017. It can be observe from the forecast values that, the roads in the municipality be expanded in order to accommodate this increment.

.

5.1 Summary of Findings

From 2004–2005, the number of motorbike registrations spiked, then fell precipitously; from 2007–2012, it rose again; and finally, from 2012–2014, it fell dramatically. Its growth rate resumed in 2015. According to the results, the most common causes of motorbike accidents were being struck by another vehicle, hitting an animal, hitting the pavement, or being hit by a motor.

The pattern of increases in the prediction for 2017 is quite consistent. That would be the months of 2017 (January through December).

Respondent listed many reasons for not contacting authorities immediately after the accident, including: not being

able to identify the individual involved, believing it was unnecessary to do so, fear of punishment, physical distance, and the possibility that the authorities might demand payment. There is a financial strain on victims and the community as a whole since many drivers whose abilities have been impaired after an accident have had to sell their homes to pay for medical expenses.

5.2 Conclusion

Finally, motorbike accident reports are underreported in the municipality. People don't call the cops because they don't know who to report it to, they don't think it's necessary, they're afraid of punishment, they're too far away, or they're afraid the cops will demand money. Financial hardship has crept in as a consequence of most sufferers' diminished capacity to work and as a result, some have resorted to borrowing, using savings, or selling possessions. The ARCH-LM test also found that the registration data is not heteroscedastic, with p-values larger than 0.05 at all lags. Thus, the data exhibits homoscedasticity.

5.3 Recommendation

The study recommends the following:

It is recommended that the Road Safety Commission should focus its future campaigns on public education about road safety in order to reduce the number of motorcycle accidents in the region and the associated financial burden on society. This is because both the number of motorcycles entering the region and the number of accidents involving motorcycles are on the rise.
Underreporting of accidents in the Municipality may be helped if the public is educated on the need of reporting them to the police.
Based on the study's predictions, the total number of motorbike registrations is expected to reach 7,679 in 2017. To handle this influx of riders, the roads in the municipality will need to be expanded. Additionally, the MTTU should work with the national safety commission to launch a public awareness campaign about the importance of reporting accidents to the police and obeying safety precautions. This will help reduce the likelihood of motorists being followed by law enforcement.

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