Analyzing the Causes of Motorcycle Accident in Bangladesh:

Survey on four districts of Rajshahi Division

Criteria for fulfilling the requirements for obtaining Honors Degree under the Department of Political Science, Varendra University

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C E R T I F I C A T E

I (undersigned) Dr. Md. Habibullah, do here by declaim that Md. Ashraful Islam has completed his research work and written this thesis titled, "Analyzing the Causes of Motorcycle Accident in Bangladesh: Survey on four Districts of Rajshahi Division" under my close supervision. The thesis contains his own point of view which he has compiled through his own investigation.

Thus, the dissertation is recommended and forwarded to the Varendra University through the department of Political Science. I sincerely request the concerned authorities to take necessary steps. I do recommend the Varendra University to accept his work as a partial fulfillment of his BSS degree from the department of Political Science, Varendra University, Rajshahi.

Dr. Md. Habibullah

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DECLARATION

I (undersigned) Md. Ashraful Islam, do here by declaim that completed research work and written this thesis titled, "Analyzing the Causes of Motorcycle Accident in Bangladesh: Survey on four Districts of Rajshahi Division"; Perspective and Causes. During my research working was under the supervision of Dr. Md. Habibullah. I am submitting my dissertation to the department of Political Science, Varendra University, Rajshahi as my partial fulfillment of BSS degree. I do take sole responsibility for every content inside the dissertation. I also do claim that these are my own and original findings.

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Firstly, I want to thank the Almighty Allah who gave me strength and patience to complete my dissertation. I also want to convey my humblest, sincere and deepest sense of gratitude to my honorable teacher and supervisor, Dr. Md. Habibullah, for giving me time, important suggestions, encouragement, directions and inspiration that helped me to complete this study, without his guidance and advice this work would never been possible. It is an honor for me to work under his supervision and to be his student. I would like to extend my gratitude for the cordial support of the respected teachers who engaged in this study as respondents. Finally, I express my cordial love and respect to each and every person for their special cooperation and inspiration.

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Analyzing the Causes of Motorcycle Accident in Bangladesh: Survey on four Districts of Rajshahi Division

Abstract

Among the vehicle accidents in Bangladesh, motorcycle accidents are highly prevalent. In the last few years, especially since the introduction of app-based ride services, new motorcycles are constantly hitting the roads. Private or professional motorcycle driving is often seen in villages and towns. As road accidents are increasing due to thousands of motorcycles in cities and villages, the passengers and pedestrians on roads and footpaths are also facing adverse situations most of the time. Women, children, patients and the elderly are facing the most difficulties in road traffic due to motorcycles. Riding at reckless speed, not being able to keep the balance of the body, talking on the mobile phone while moving, bike accidents are constantly increasing due to various reasons. These two-wheeled vehicles are exceeding other vehicles in road accidents, every day there will be some news of bike accidents in the news pages! As if it has become a daily routine for us. I have tried to complete and elaborate my research work by adopting the case study method, keeping these goals in mind to find out the root cause of motorcycle accident in Rajshahi division and to reveal the root cause from various data. The main findings that I have found in completing my research work are, talking on mobile while moving, over confident crossing any crossing or turning at reckless speed, riding bike at over speed without doing motorcycle maintenance. Based on these results, I can recommend that reckless motorcycle driving be avoided. Keep an eye around while walking on the road. Checking the bike before riding. Be careful about driving in rain. Helmet and proper clothing must be worn. Thus, I have tried my best to explain my research work in simple and clear language.

CHAPTER ONE

INTRODUCTION

1.1 Background

Accidents are a catastrophic problem for the highway transportation system because they result in serious casualties, property damage and physical harm. Road traffic accidents are the most frequent, unwanted and unfortunate occurrence with significant consequence of injury, fatality and property damage (Sharma et al., 2011-2012). 1.35 million persons lost their lives in traffic-related accidents in 2016 (WHO, 2018). Only half of the registered automobiles in the world are found in low- and middle-income (LMIC) nations where 90% of these deaths occurred (WHO, 2018). Since the 1990s, the number of traffic accidents in Bangladesh, a low-income nation, has increased at an alarming rate. The death rates are estimated to be increased by 2.34 million if any immediate actions are not taken (Ahsan et al., 2011). Lower and middle income countries are the most vulnerable to these accidents where more than 93% of road accidents take place (Ahmed et al., 2014). Due to these incidents, Bangladesh, a country in south Asia, is suffering terrible repercussions. The statistical result of around 85 fatalities per 10,000 registered motor vehicles each year, followed by an increase in the number of cars, may be used to gauge the severity of road accidents in this nation (Mahmud et al., 2013; Ahmed et al., 2014).

According to estimates from the World Health Organization (WHO), over 20,000 individuals in this nation die every year due to of traffic accidents (Mahmud et al., 2013). It is quite concerning that pedestrians, bicyclists, motorcycle riders and users of non-motorized vehicles account for around 70% of all traffic deaths in the nation. Additionally, the number of motorcycle accidents and related fatalities is dangerously rising (Rahman, 2015). From 3% in 1998, the percentage of fatal motorcycle accidents has grown to 22% in 2017. According to a study, Bangladesh has Asia's highest incidence of fatal motorcycle accidents (28.4 deaths per 10,000 motorcycles annually); (Nguyen, 2013). Road accidents involving motorbikes are rising as they become more and more popular in Bangladesh among people from various socioeconomic levels. Motorcycles draw young commuters in particular because they are a practical substitute for unreliable and inconvenient public transportation. According to Road Safety Foundation a total 44.28% casualty have taken place in motorcycle accident.

A total of 206 out of the 543 persons died in motorcycle accidents, with riders and passengers making up 37.93% of the fatalities and bystanders making up 21.36%. The majority of incidents in March were caused by trucks, covered-vans, and pickups (30.11%), followed by motorbikes (26%), three-wheelers (15.32%), and buses (10.43%). Accidents

typically happen as a result of simultaneous, mixed-flow patterns of vehicles and pedestrians. Road accidents are a nuisance that are unavoidable in daily life. It cannot be entirely avoided. However, proper engineering measures might lessen the frequency of accidents at various road crossings and mid-blocks (Filho et al., 2019). A good system of transportation is very essential for rapid industrial and economic growth for any country where roadway, airway, waterway and railway are different modes of transportation among which roadway is most appreciated and in which accident frequently occurs (Frey, K. 2010).

Although there are some examples of the application of the "safe systems" approach in low- and middle-income countries, they are restricted in the sociotechnical approach's application in that they only advise moving beyond blaming only the driver (Bliss and Breen, 2013, Ogombe, 2017); they also do not discuss the multi-leveled, hierarchical nature of complex systems or make reference to interactions or emergence, two concepts that are essential to the sociotechnical systems approach. As a result, there is a critical need for road traffic collision investigation frameworks that incorporate the analysis of contributing factors from various parts of a sociotechnical system and the interactions between them in the domain of road safety (and beyond) in low and middle-income countries (Lee et al., 2017). Bangladesh is a low-income country, there is a strong need for systems-based research in order to bring improvements to the road safety sector (Hamim et al., 2019).

1.2 Objectives of the Study

- To find out the causes of bike accident in the study area
- To analysis the impact of those accident
- To provide possible recommendation to reduce bike accident in the study area.

1.3 Significance of the Study

The research's relevance may be summarized as follows:

1. Even though the research is conducted for academic purposes and is limited to a single road, providing a clearer understanding of the complex problem of highway transportation in general, and accidents in particular, may be beneficial.

2. The findings of the study will aid in the gathering of information and raising awareness about the dynamics of highway traffic accidents, which will aid in the development of counter measures to reduce the number and severity of accidents.

3. It is important for law enforcement and the allocation of personnel for surveillance by the police (observation).

4. The government, in particular the Bangladesh Road Transport Authority, must assess the need for road improvements, vehicle inspections, and educational and propaganda activities.

5. It also serves as a source of information for organizations involved in road safety management and aids in the improvement of highway transportation safety planning decision-making efficiency.

6. Finally, it aids in the conduct of later investigations in order to improve the current analyses' conceptual and methodological foundations.

1.4 Scope of the Study

In order to carry out this research different road accident case studies have been analyzed comprising vehicle collisions as well as pedestrian-vehicle collisions. These case studies involve both urban and rural road settings which gives the opportunity to have an insight on the differences in the failure of system causing accidents in different road setting. Besides, Bangladesh is a low-middle income developing country; the outcomes of this study will be applicable to other similar scenarios as well. This will be a pioneering initiative to evaluate the suitability and effectiveness of such systems based approach in low-middle income developing country.

1.5 Limitation of the Study

Due to a paucity of information on road traffic accidents in terms of their frequency, kind, distribution, volume of traffic and other pertinent factors, this study was challenging. The study must also rely on data from the extensive, time- and resource-consuming highway and thana police archives because the information that is now accessible is more general in nature. Reassurance of the study's goal to the volunteers was equally challenging and unpleasant. The fact that accident data is manually entered indicates that some statistical information may have been misplaced in the offices, which is another drawback. There was a sizable prevalence of inappropriate data management in every police station. Since the data had to be handled manually, the plan was to write it down and copy it from the appropriate department. In regression analysis, the cause and effect connection between the variables is typically taken for granted to remain constant. Because this presumption isn't

always true, applying the regression equation to estimate a variable's values might provide inaccurate and misleading results. Although the multiplicative structure of its seasonality gives the Holt-Winters model certain limitations, it is nevertheless tremendously strong overall.

Chapter Two

Literature Review

2.1 Introduction

The broad description of the systems-based approach to investigating traffic accidents is covered in this chapter. Although using sociotechnical approaches in safety-related events has gained popularity in high-income industrialized nations, there have been few attempts to use these strategies in low- and middle-income developing nations. This chapter will place a strong emphasis on evaluating various sociotechnical approaches for conducting investigations into road traffic incidents from various angles, including their respective benefits and drawbacks, acceptability, application, etc. Also the works done in safety engineering from human factors point of view in various parts of the world will be discussed to get an insight on the usefulness of application of such methods in investigating road accidents especially in a low-income developing country like Bangladesh.

2.2 Introduction to Transportation

The three main modes of transportation are aerial, waterborne, and on land. The thesis's main topic is the conveyance of the lands. A mode of transportation that concentrates on locations with heavy traffic levels is referred to as "land transportation." The economic development of a nation depends heavily on transportation, which demands a lot of attention. But as the number of motor vehicles on land rises, global road traffic mishaps are becoming more severe, which makes transportation impotent.

2.3 Traffic Accidents

Any vehicle collision that occurs on a public roadway (beginning on, finishing on, or involving a vehicle partially on the highway) is classified as a traffic accident (Bitew, M. 2002).

RTA is a huge global public health issue that is described as "collisions between vehicles, vehicles and people, vehicles and animals, or vehicles and fixed obstacles," according to the dictionary. Every year, around 1.2 million people are killed worldwide, with over 20 million people injured or incapacitated (Royal Government of Cambodia Ministry of Public Works and Transport Country Report on Road Safety, 2007). Every year, nearly 85% of all deaths are caused by automobile accidents. In terms of illness burden, road traffic accidents are expected to rank third by 2020 (Finch DJ et al., 1994). A "multiple-vehicle traffic accident" is a collision between two or more moving vehicles. In contrast to single-vehicle crashes, not all vehicles engaged in a multi-vehicle collision are at fault for the accident. As a result, in multiple-vehicle incidents, factors like road type, speed limit, and number of

cars involved in the accident are far more likely to have a role in predicting injury severity (Getu, S. 2007).

2.4 International Fatalities and Injuries

2.4.1 The Transport Apocalypse (Disaster)

In 1998, road traffic accidents were among the top ten major causes of illness burden in higher-income nations, as assessed in DALYs (disability-adjusted life years). In developing countries, road traffic accidents were the largest source of injuries, ranking 11th among the top causes of lost years of healthy life. According to a World Health Organization/World Bank research titled "The Global Burden of Disease," non-communicable disease mortality are expected to climb from 28.1 million per year in 1990 to 49.7 million per year by 2020. In terms of diseases, road traffic accidents are anticipated to climb from ninth place in 1998 to third place in 2020 (Hossain, M& Faruque, O. 2019).

2.4.2. The Magnitude of the Problem

An accident survivor occupies one out of every ten hospital beds in affluent countries, as well as many developing countries. Road accidents are the major cause of serious injury in most countries. External factors account for roughly four times the number of deaths in the developed world according to the WHO's 1995 State of World Health Report (WHO, 2018).

2.5 Bangladesh's Road Accidents and Casualties

Road traffic accidents (RTA) have risen to the top of the list of worries for a country's development. Bangladesh, being a developing country, is vulnerable to the consequences. Despite tremendous advances in international traffic safety measures, road accidents remain a prominent source of death and serious injury, particularly in developing nations like Bangladesh. The general trends in road traffic accidents (RTAs), fatalities, and injuries show that from 1971 to 2007, the number of RTAs, fatalities, and injuries climbed continuously with few changes, before gradually declining after 2007. Despite the fact that the number of RTAs and fatalities has been declining in recent years, the ratio of deaths to injuries has increased significantly. The number of registered vehicles per 10,000 people rose steadily over time, with a sharp rise starting in 2009. Dhaka division has the highest percentage of RTA (34%) and deaths due to RTA (32%) while Barisal and Sylhet divisions have the lowest percentage of RTA (4%), and deaths due to RTA (3%) in Barisal division. (Hossain, M& Faruque, O. 2019). The highest number of injuries happened between the

ages of 21 and 30, whereas the highest number of deaths happened between the ages of 11 and 30. Cars being run over and head-on collisions cause the bulk of RTAs and RTA-related deaths. The severity of traffic accidents and the number of deaths are higher during the festival seasons due to the higher level of travel than usual.

2.6 Necessity of Systems-Based Road Safety Approach in Bangladesh

People constantly interact with several systems in daily life, including the economic system, cultural system, transportation system, social system, etc. Due to the complicated linkages between its technical (engineering) and social sub components, the transportation system, particularly the road traffic system, is the most complex and deadly of these systems. Traffic accidents continue because a significant and steadily rising number of fatalities and serious injuries in developing nations, despite tremendous attempts and enormous advances in road safety concerns in the developed world. Each year, road traffic accidents cause 50 million injuries and 1.25 million fatalities worldwide. More than 90% of road fatalities take place in low- and middle-income nations (WHO, 2015).

As a developing country, Bangladesh observes this problem of road traffic crashes and resulting injuries and fatalities in more acute dimension. As per police reported ARF (Accident Report Form) database, on an average more than 3000 crashes and 2700 fatalities along with 2400 injuries occurred annually on roads in Bangladesh; while it is widely claimed that significant number of crashes are not reported to the police and as such the above figures may well be under reported (ARI, 2015). Analysis in Microcomputer Accident Analysis Package (MAAP5) identifies that about 43% road accident occurs on National Highways in Bangladesh. Among the crash types Hit-pedestrian (42%) is the most dominant followed by Head-on collision (20%) and Rear-end collision (13%) (ARI, 2015).

2.7 Patterns of Urban Growth and Road Traffic Development

Cities in developing nations are rapidly growing, with population growth rates of more than 6% year (Knight P, & Trinca G., 1998). In 2001, more than half of the world's population will reside in cities, up from 29 percent in 1950, according to UNDP's (2000) evaluation and projection of population growth.

As a result, rapid urbanization and population expansion in a city increase the need for travel and the types of urban transportation available (Knight P, & Trinca G., 1998). The growth in motor vehicle ownership in the majority of the cities of industrialized nations is exerting strain on urban transportation networks in addition to urban population growth.

Gwallian noted in 1998 that the pace of motorization in developing nations rose at a rate of 15-20% each year, which was noticeably fast, which was significantly faster than the 3-5 percent per year pace of urban population growth in many of them. According to these figures, the global car fleet and traffic congestion in industrialized countries are both growing.

Despite significant growth in car ownership, current per capita vehicle ownership is still low when compared to wealthy countries. According to TRL (2000), the ratio in the United States, Europe, and Japan is just 2 to 3 people per vehicle, but it can be as high as 500 to 1000 people per car in countries like India, Burkina Faso, and Bangladesh (Allison, C., Revell, K. M. A., Sears, R. and Stanton, N. A. 2017).

2.8 Major Factors for the Roads Traffic Accidents

Road traffic accidents are influenced by a variety of factors. Due to their unfavorable impact contributing to road accidents, these factors may raise the severity of road accidents.

2.8.1 Causes of Road Accidents

Three key causes contribute to road accidents. The following key causes are responsible for a substantial number of road accidents and property damage, among other things, due to the high severity of their errors. The risks posed by these elements around the world are not diminishing, but rather rising, as evidenced by the fact that traffic accidents are increasing on all continents (Al-Madani, H.M.N., 2018).

The following are the most important factors:

1. Human Factors (Road Users)

2. Road Defect

3. Vehicle Defect

2.8.2 Risk Factors for Road Traffic Crashes and Injuries
1. Factors influencing exposure to road traffic

Economic factors such as economic development, demographic factors such as age, gender, and place of residence, land use planning practices that influence how long people travel and how they travel, a mix of vulnerable road users and high-speed motorized traffic, a lack of consideration of how roads will be used when determining speed limits, and road design and layout are all factors to consider (Al-Madani, H.M.N., 2018).

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2. Risk factors influencing being involved in crash

The number of lanes, the common variety of vehicles every day, the dimension of the route, the kind of road, the voidance facilities given, the surface condition of the pavement, the foremost common vehicle kind on the road, the presence of shoulders, and therefore the presence of edge obstructions like advertising hoardings, trees, then on square measure all factors to think about shut proximity to the lane, the presence of median barriers to channel traffic, the presence of ribbon (decoration) construction close to roads, inappropriate and excessive speed, the presence of alcohol and medicines, exhaustion, being young and male, being a vulnerable road user in associate degree urban or residential area, driving within the dark, poor vehicle maintenance road style layout and maintenance deficiencies, low visibility because of atmospheric condition, dangerous sightedness, and different factors, etc. square measure some exposure to roads traffic accident .

3. Risk Factors Influencing the Severity of a Crash

Individual characteristics such as age influence a person's ability to tolerate a collision; insufficient and excessive speed; non-use of seatbelts and child restraints by car users; unforgiving roadside items such as concrete pillars; insufficient vehicle crash safety, such as airbags for occupants and vehicle soft fronts for those who may be struck by vehicles; insufficient vehicle crash safety, such as airbags for occupants and vehicle soft fronts for those who may be struck by vehicles.

4. Risk factors and the consequences of injuries sustained as a result of a crash

Delayed accident identification and transfer to a medical institution, rescue and evacuation, lack of effective treatment prior to arrival at a medical institution, post-collision fires, and hazardous material leaks are all examples of delays in accident identification and transfer to a medical facility.
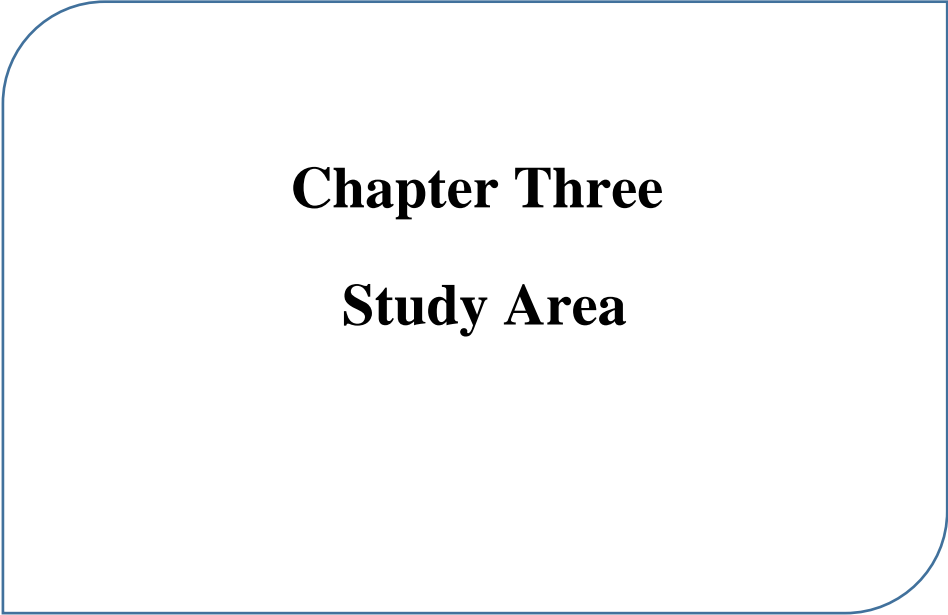
2.8.3. Road Accident Costing Evaluation

One of the most important concerns confronting modern civilizations is road traffic collisions. Aside from the humanitarian aspect of reducing road deaths and injuries in wealthy countries, there is a compelling economic case for doing so, as they consume large financial resources that underdeveloped countries cannot afford to lose. Because of the fast rise of road transportation, the deaths of people and the substantial economic losses caused by road accidents require continual monitoring. Better and more effective accident information management strategies are now widely acknowledged. The growing incidence of traffic accidents in Rapids is putting a significant social and economic strain on victims,

as well as a variety of direct and indirect expenses on individuals and the government. Injury, death, property loss, and vehicle damage are all consequences of road accidents. Both of these have a negative financial impact on the economy. As roads are improved, the number of traffic accidents will drop. As a result, the economy gains tangible benefits. Despite the fact that total mortality has reduced, and life expectancy has increased, the chance of dying on the roadways has climbed considerably. Of course, road safety is simply one of many issues that require finance and other resources in both developed and developing countries (Mannan, M.S. and Karim, M. 1999).

2.9 Systems-Based Accident Models and Methods

Systems-based accident analysis methods have been applied across various safety critical domains to identify causal factors and inform appropriate system reform and accident countermeasure development. The application of these methods in the road traffic safety domain has to date been sparse; however, recent evidence suggests that they are likely to be useful as part of an overall accident and injury surveillance and prevention system (Salmon et al., 2010).

According to epidemiological methods, accidents are a result of both latent and overt system flaws. Like resident infections, latent conditions like managerial techniques and organizational culture may be present in a system for a very long period. When dangerous activities, or active failures, combine with latent failures to penetrate a system's defenses, the negative effects only become apparent. Swiss Cheese model, HFACS (Human Factors Analysis & Classification System), and other methodologies are used (Underwood and Waterson, 2013). Compared to the sequential ones, these more accurately depict how organizational elements affect accident causation. The sequential models' cause-and-effect concepts, which outline a linear path of accident causation, are still used by many, though (Hollnagel, 2004).

Chapter Three

Study Area

Rajshahi district is situated on the bank of Padma River. The Naogaon district in the north of Rajshahi district, West Bengal state of India in the south, Kushtia district and Padma River, Natore district in the east, Chapainawabganj district in the west. The main river of the country, Padma, enters Bangladesh from India through the border of this district. The total area of this district is 2407.01 square kilometers.

Natore District is a district located in Rajshahi Division of Bangladesh. Naogaon district and Bogra district are in the north of the district, Pabna district and Kushtia district in the south, Pabna district and Sirajganj district in the east and Rajshahi district in the west. The area of the district is 1905.05 square kilometers. This district is basically one of the eight districts in the northwest of Bangladesh. Natore is the 35th district of Bangladesh in terms of area.

Chapai-nawabganj District is an administrative region of Rajshahi Division in the northwestern region of Bangladesh. This district under Rajshahi division is sometimes called as Nawabganj and Chapai. Chapai-nawabganj district with a total area of 1,744 square kilometers is located in the westernmost part of the map of Bangladesh. Rajshahi and Naogaon districts to the east, Malda district of West Bengal state of India to the north, Padma River and Malda district to the west, Padma river to the south and Murshidabad district of West Bengal state of India.

Naogaon District is an administrative region of Rajshahi Division in the northwestern region of Bangladesh. Naogaon is an "A" category district of Bangladesh according to the number of upazilas. Naogaon district is geographically part of the larger Barendra land. The territory along the Bangladesh-India international border in the north-western part of Bangladesh which was considered as Naogaon subdivision till 1st March 1984 is the present Naogaon district of Bangladesh. It is bordered by South Dinajpur in India, Natore and Rajshahi districts in Bangladesh in the south, Jaipurhat and Bogra districts in the east and Malda in India and Chapainawabganj district in Bangladesh in the west. The total area of this district is 3435.67 square kilometers.

(Source: https://en.banglapedia.org/index.php/Rajshahi_Division)

The most common factors that trigger problems are listed here, including:

- Heavily congested units of three-wheelers, pedestrians, and cars, resulting in the largest number of injuries seen in relation to others.

- There are inadequate road networks and signals, which results in a large number of injuries.
- Decent asphalt roads, but steep and angled, making driving difficult.
- Due to a lack of speed control or management, as well as traffic control systems, there is poor traffic regulation and excessive over speeding.

The majority of events are seen in places with high traffic levels, such as town districts and crossing locations. This study shows where to focus your attention and why accidents are more likely to occur in this field, as well as offering solutions.

Study Area Map

Naogaon

Chapai-Nawabganj

Rajshahi

Natore

N

0   4.5   9   18   27   36
Miles

Chapter Four

Methodology

Every research is made up of a set of activities that are linked logically and operationally. A study's viability in terms of results and efficient use of time and money is determined by its logical and operational links. As a result, correct methodology is critical for completing the research on time and within budget. Following the development of goals and objectives, the working procedure or timetable is prepared. It refers to the method by which the investigation will be carried out or the actions required to carry out the study. All feasible activities are incorporated during this phase. It underlines which task will be performed next once one has been completed.

Research methodology is a way to systematically solve the research problem. It describes certain procedures to incorporate sporadic thoughts and views to perform the study. In fact, some definite courses of actions are performed to reach the objectives of the study and to conduct further works within the study. Research methodology refers to detail approaches to conduct a study. It also includes those techniques which are used in different stages in completing the study. In order to identify the causes of Bike accident and analyzing those problem in Rajshahi, Chapai-Nawabgonj, Natore and Naogaon district of Bangladesh many studies will be conducted. Those approaches will be standardized effectively to ensure the properties of variables that help to reach the goals of the study.

4.1 Conceptualization Phase

This step entails conducting a desk study in order to generate basic ideas regarding the research problem. In this step, the measurement of Bike accidents, their economic repercussions, and provide possible recommendation to solve those problems. As a result, many relevant books, papers, reports, articles, and unpublished theses from reputable universities are thoroughly studied in order to get the necessary knowledge and thoughts regarding the research subject. This results in a thorough understanding of the problem's viewpoint.

4.1.1 Selection of Study Topic

Research problem refers to a statement about an area of concern, a condition to be improved or a difficulty to be eliminated. After gathering necessary information and ideas specified problems are identified to conduct a study on it. Traffic accident causes fatality, monetary loses and health problem. Thereby it creates barrier in the economic development of a city as well as a country. So, it should be eliminated to provide a better traffic system which is the pre-condition of economic development of a city or a nation.

4.1.2 Formulation of Objectives

Research objectives describe the purposes of the study. It determines what is to be achieved by the study. In broad sense, the objective can be stated as research question. Now-a-days it is a crying need to decrease the Bike accident for the safety and economic development of a country. In order to do so, traffic accident characteristics should be understood at first. As a result, the study's aims are tailored to reveal the characteristics of a traffic accident situation.

4.2 Pre-data Collection Phase

4.2.1 Selection of the Study Area

In any case, choosing a study area is a challenging problem. A variety of literature is examined in order to determine the study field. The research area should include a clear scenario of an accident-prone location and the implications of multiple traffic accidents over time. To improve the study's results, a reconnaissance survey was conducted in the study area. A specific location's accident experience is higher than that of other locations on the same road due to road or environmental factors. These areas are referred to as accident-prone areas. Accident-prone zones are identified using the number of accidents detected and regression algorithms. The four district of northern part of Bangladesh (Rajshahi, Chapai-Nawabganj, Natore & Naogaon) was chosen as the study region for this research.

4.2.2 Reconnaissance Survey

Reconnaissance survey refers to preliminary physical survey before starting field work. It helps to finalize the study area and prepare for the next works. Photographs and other necessary information are collected during the survey to understand the existing physical conditions of road of the selected area.

4.3 Data Collection Phase

The method of collecting and evaluating data on variables of interest in order to answer research questions is known as data gathering. In conducting a study, there are primarily two types of data collected: primary data and secondary data.

4.3.1 Primary Data Collection

After the reconnaissance survey data were collected by field survey with google form. Total 400 data were collected from the study area. Choosing the respondent randomly and asking various question related to the Bike accident and store them to the google form. See the questionary form in appendix.

4.3.2 Secondary Data Collection

Different traffic related studied collected from different secondary sources like newspaper, online article, journal paper, book etc. Find out the main causes of the accident, analyzing the problems. Also collect some accident related data from different police station in those study area.

The data included Accident Date, Location of the Accident, Collision Type, Number of Vehicles Involved, Number of Deaths, Injury, Details of Victim, and some more information about how accident occurred. After analyzing the accident data, the area having maximum frequency of accident is identified. The shape-file of our study area was digitalized using a Google Earth map. ArcGIS (version 10.3) was used to locate the hazardous area on the map and Tableau used for forecasting road accident of the study area.

4.4 Data Analysis Phase

4.4.1 Data Assembling and Processing

Quantitative statistical approaches were used to analyze the data. Thus, descriptive approaches in the form of tables, charts, and graphs were used to interpret the organized data using statistical tools to the trends and situations of vehicle accidents on the highways on the research routes. Accident density and accident rate are used to determine the most dangerous locations among the streets of the places.

After gathering data from primary and secondary sources, everything is put together and processed in a specific way. PC ArcGIS (10.3) software was used to digitize maps in order to collect data. After that, using the same software, digitize the attribute and add different facts on the fatality.

Then, if needed, data and information are presented in tabular, graphical, and other formats. For this, available statistical packages such as Microsoft Excel and SPSS were employed.

4.5 Outcomes Finalization Phase

4.5.1 Data Analysis and Presentation

The type of vehicles involved, crash type, age distribution of victims, number of accidents and fatalities on different roads, time of accidents, and roads with a higher frequency of casualties are all examined. Then all spatial data has been analyzed with the help of ArcGIS and other data analyzed and presented in form of tables, graphs with the help of Microsoft Excel software. Forecasting of accident developed with the help of Tableau software. In the third phase some software such as Microsoft Word, Microsoft Power point has been used to prepare and present the report.

4.5.2 Preparation of Draft and Final Report

Preparation of the report is the last task of the study and very important because it is last but not the least. Just after the completion of the analysis of the study findings a draft report has been produced. Then the draft report has been reformed, where necessary. Then the final report of the study has been produced. It has been encompassed all the facts and findings of the study that conducted.

Chapter Five

Analysis

5.1 Demographic analysis of the Respondent
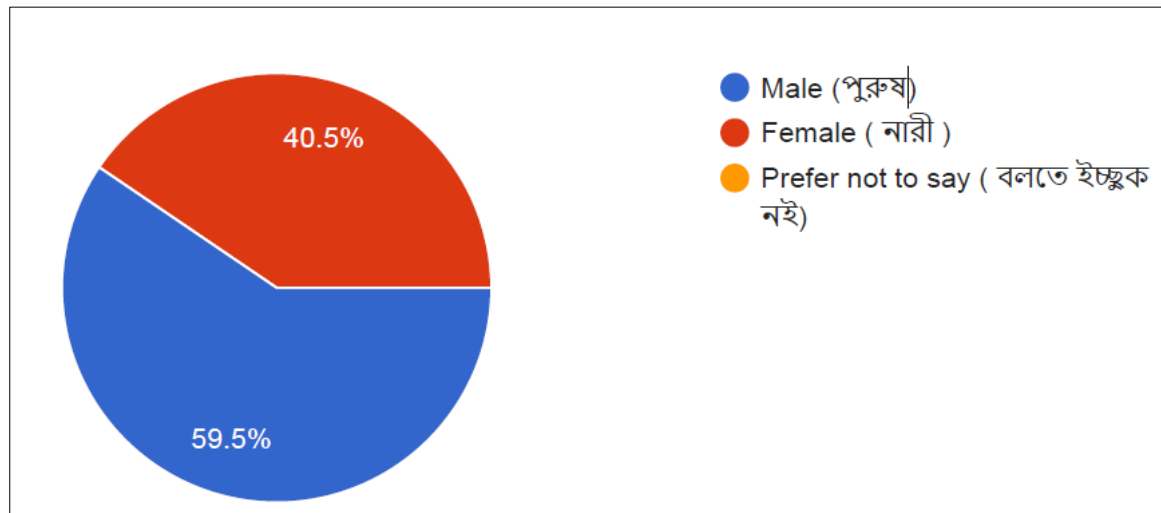
Figure 1: Gender of the Respondent

Both men and women were allowed to participate in this study. It can be seen that there were more male than female. About 59.5% males and 40.5% females participated in the survey. Although there is an option to hide gender, no one has accepted it
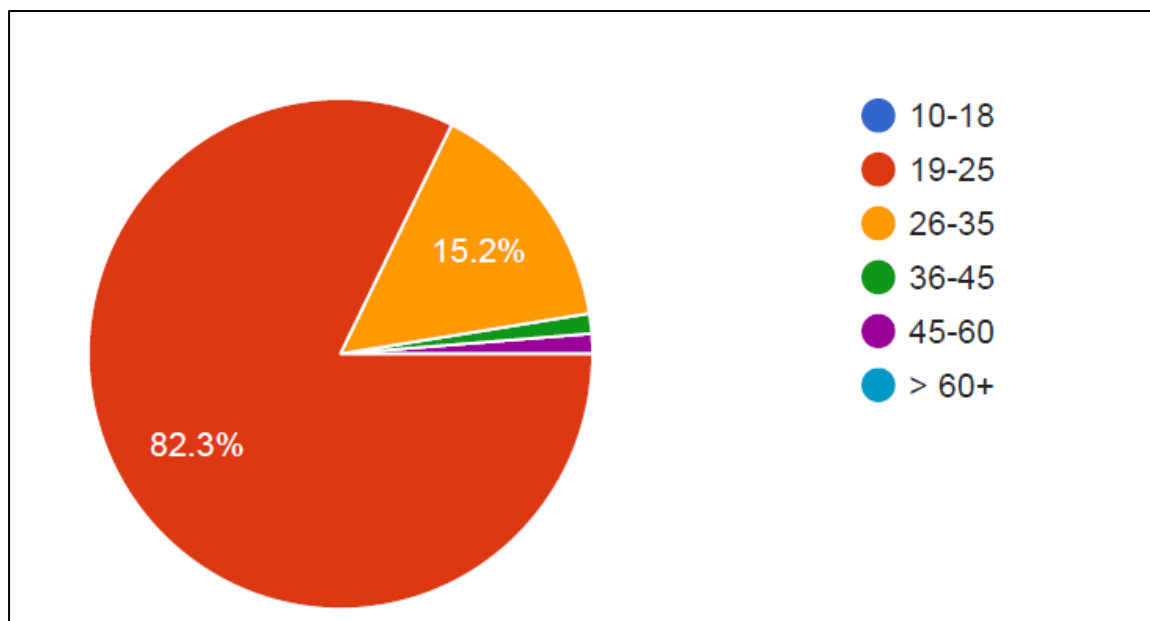
Figure 2: Age of the Respondent

In the survey we find people of different age groups. Youths and youths are seen participating enthusiastically. The highest 82.3% votes were cast by young, aged 19-25 years. 15.2% of those who voted were between the ages of 26-35. A few votes were found

for people aged 46-60 and 36-45 years, but no one was found for 10-18 years and below 60 years.
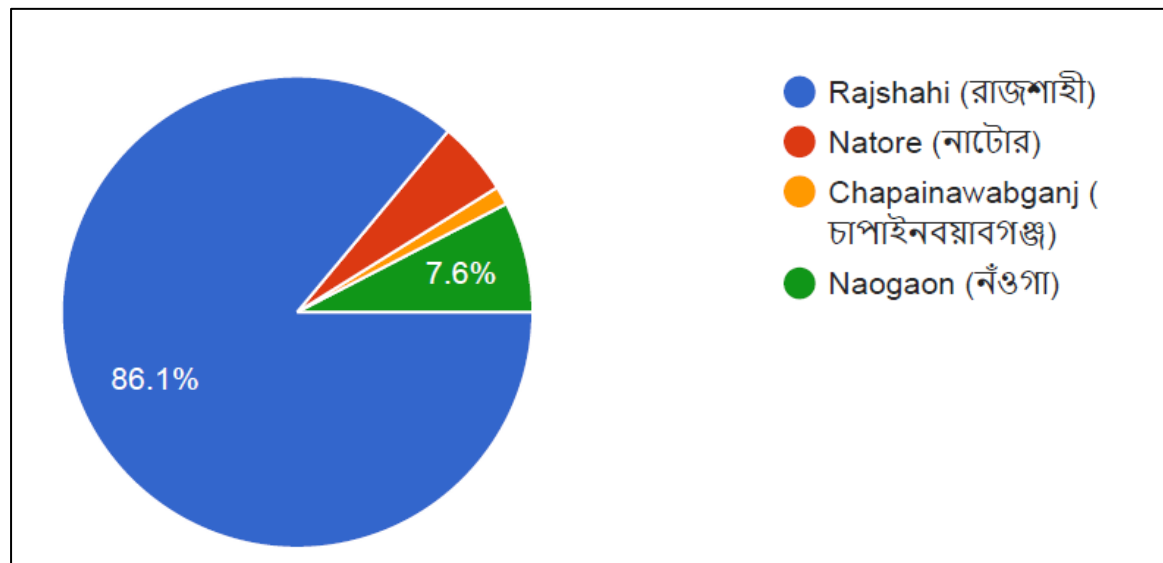
Figure 3: District of Respondents

I chose the 4 districts of the Rajshahi division of the northern region. Being a metropolis and a divisional city, Rajshahi had a large population. About 86.10% of the respondents were from Rajshahi. Naogaon had 7.6%. People of Chapai Nawbaganj and Natore also participated in it.
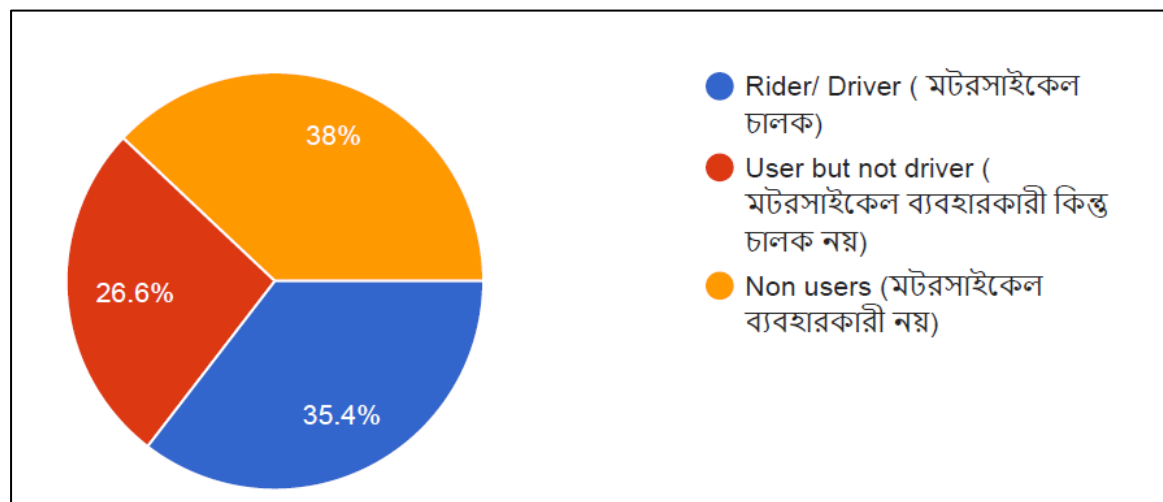
Figure 4: Usage of Motorbike

In the survey we have not only the opinions of bike riders. I have accepted the views of all riders and non-riders. Participation of almost 3 types of people was noticeable. 35.4% of the voters who ride motorbikes. But more were those who did not drive it, at about 38%.

They are not drivers but their number is not less as passengers using bikes which is about 26.6%
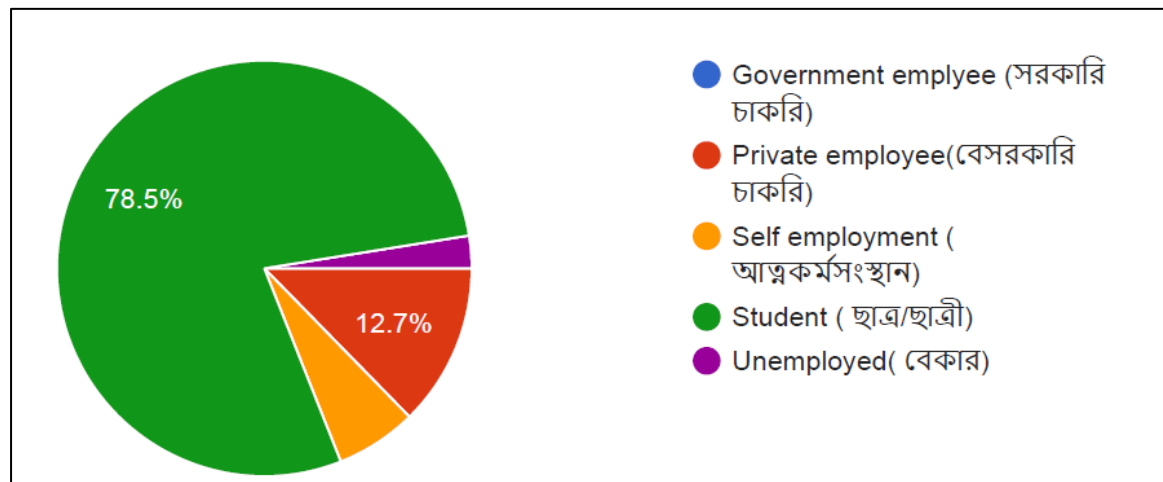
Figure 5: Occupation of Respondent

Majority of the survey participants are students. About 78.5% students participated in it. 12.7% of private sector employees participate in it. There were also a few of them involved in self-employment. Those who are unemployed also voted for it.
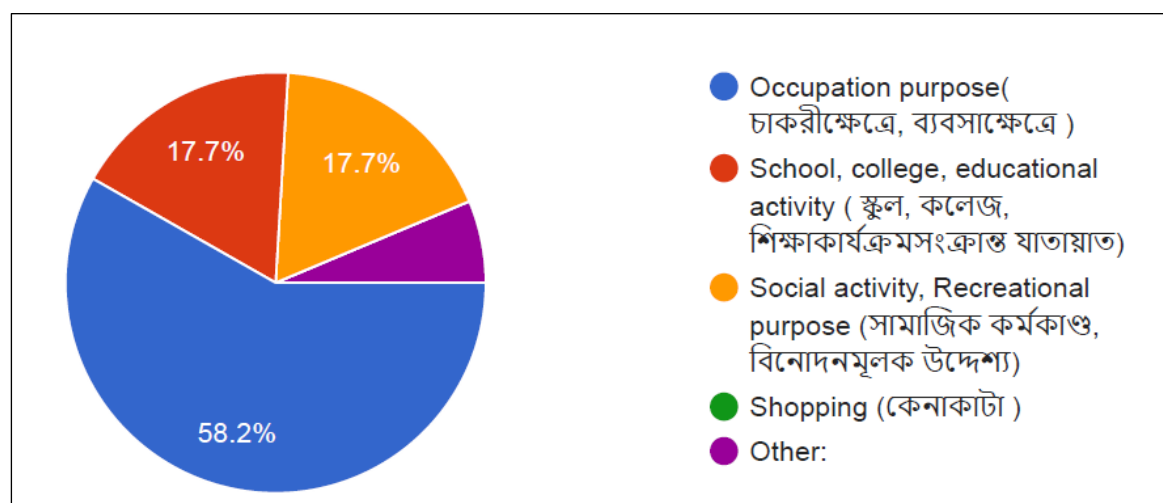
Figure 6: Purpose of using of Bike

58.2% of the voters think that motorcycles are used more in workplaces. 17.7% people think that motor bike is useful for education. Exactly the same amount i.e. 17.7% people give the same opinion in the field of entertainment and social. 6.3% people think that it is used for other purposes.

5.2 Causes of Bike Accident according to the respondent
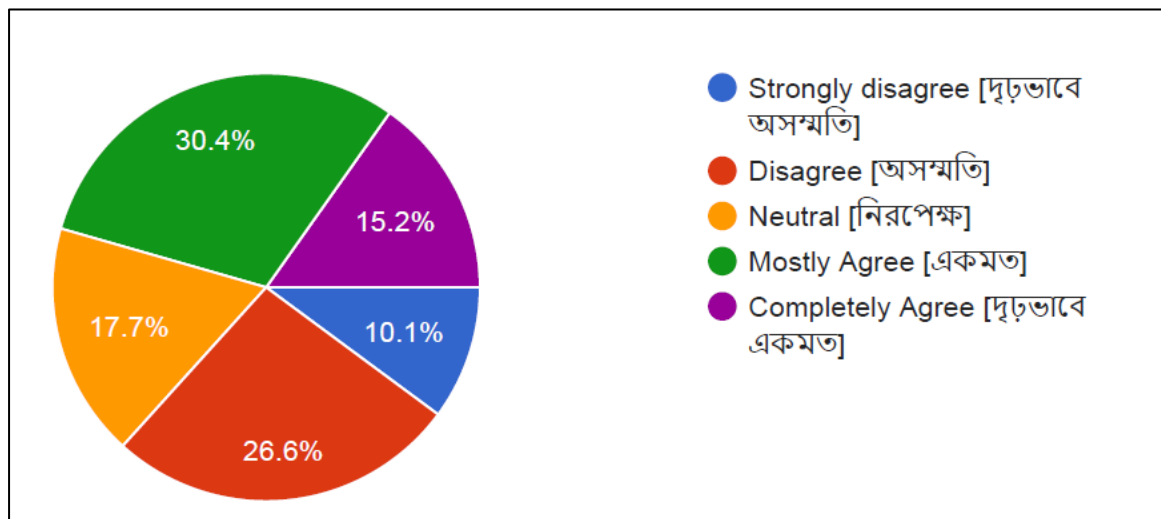
Figure 7: More CC of Motorbikes in more impactful in more motorbike accident

When respondent were asked whether the high CC of motorbike is more likely to cause accident or not. 10.1% were highly disagreeable while 15.2% were completely agreeable. 30.1% on the other hand agreed on this statement. 17.1% choose remain neutral. According to their belief high CC has nothing to do with road accident. Moreover 26.6% respondent that high CC is not impact to road accident, therefore 45.6% opined that high CC is very dangerous and 27.9% has disagreed. According to the collected data more CC is responsible for bike accident.
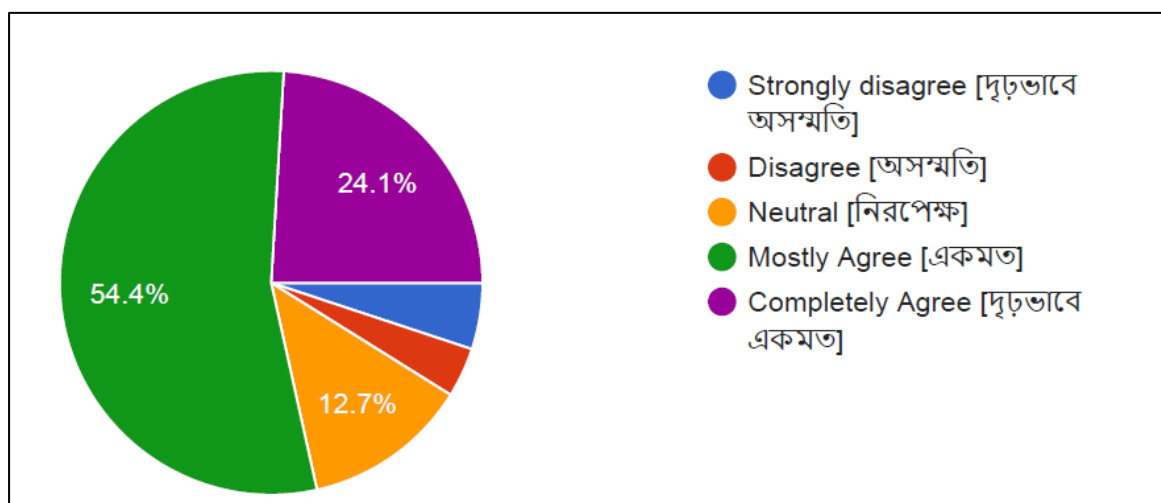
Figure 8: Mechanical problem of the Bike responsible to accident

Mechanical failure is a major and serious problem as a cause of bike accidents. It is one of the causes of accidents. About 78.5% people gave consent for this. Out of which 24.1% agreed extremely and 54.4% agreed.

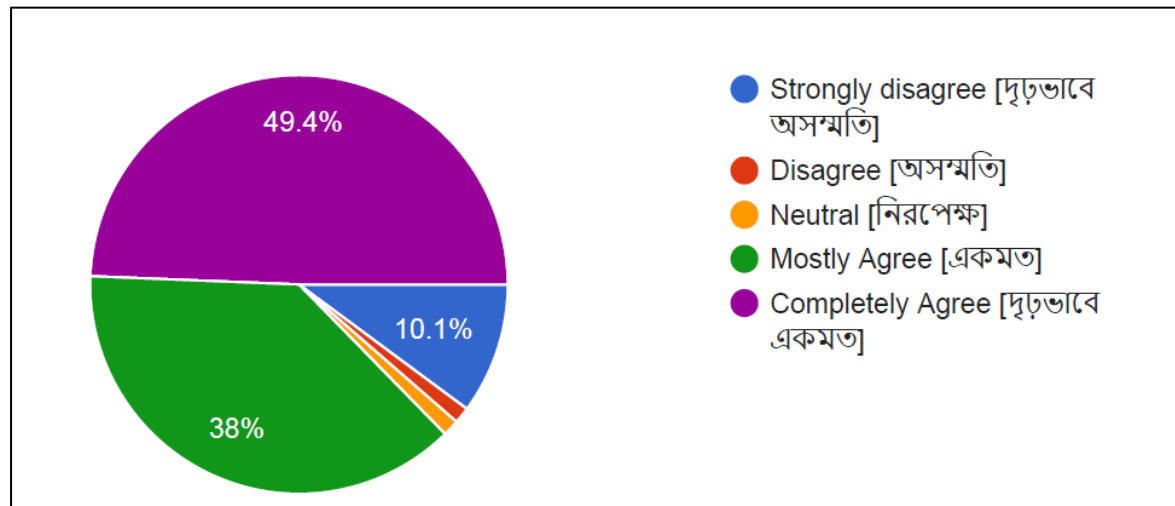3.7% strongly disagreed. 5.1% extremely disagreed. About 11.7% of people are neutral

Figure 9: Mobile phone usage, video making, music, talking during riding responsible to accident

49.4% people strongly support mobile phone talking, video recording, talking with pillion etc. while riding bike as a cause of bike accidents. 38% agreed with it but 10% people are totally opposed to it, they think it does not cause bike accident.
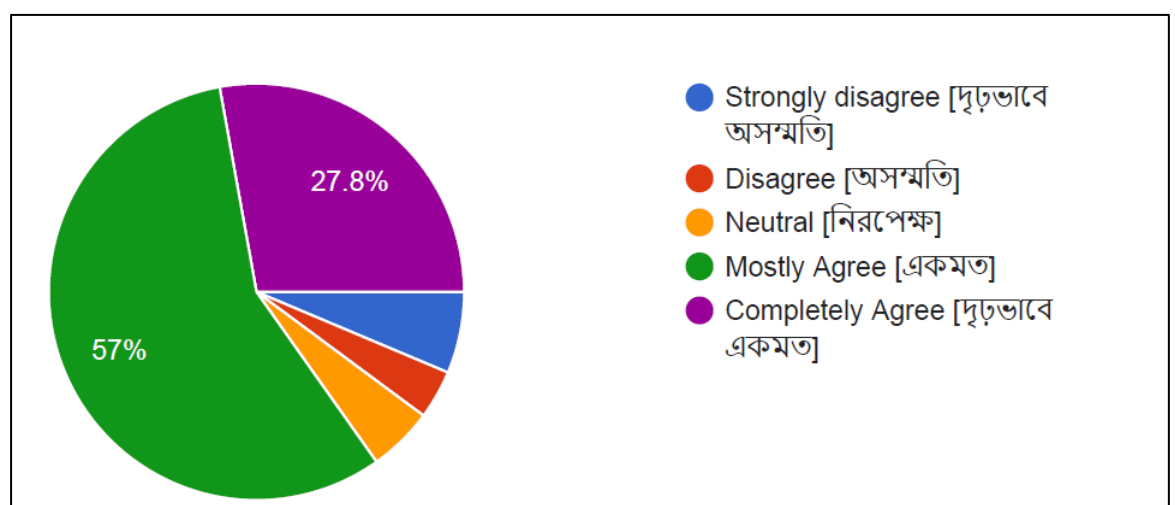
Figure 10: **Overloading** of the bike responsible to accident

Overloading bikes is one of the leading causes of bike accidents. About 57% people agreed with it, 27% extremely agreed and 6.3% disagreed with it as a cause of accidents. 7% people gave neutral opinion & 5% disagreed.
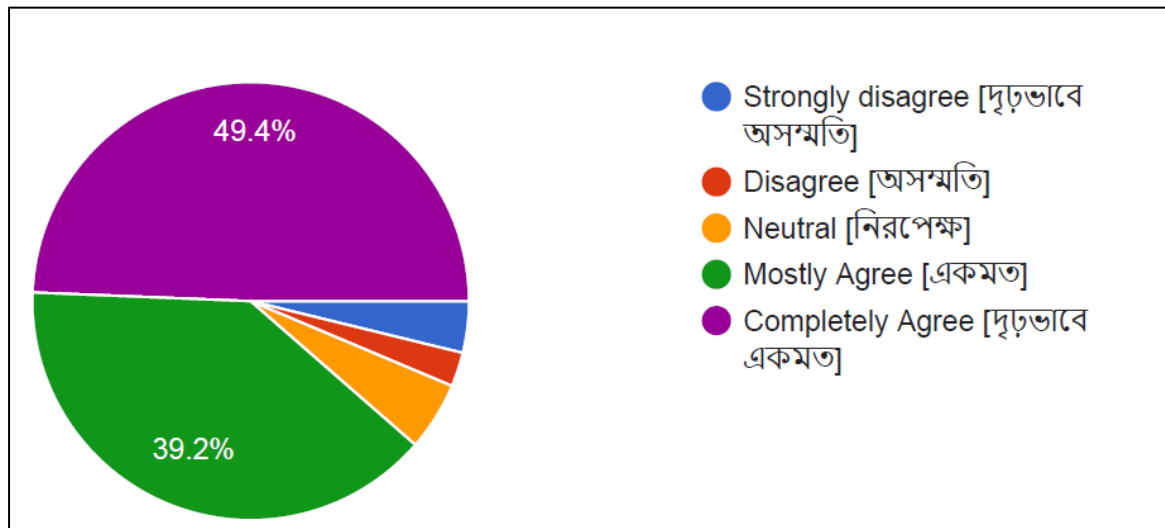

Figure 11: Drug, alcohol, psychoactive substance addiction, suicidal tendencies of riders responsible to accident

Not riding with a healthy and cool mind increases the chances of accidents. In this case, when the informants were asked, 39.2% agreed, 49.4% strongly agreed, 4% disagreed, 5% strongly disagreed and 9% people were neutral.
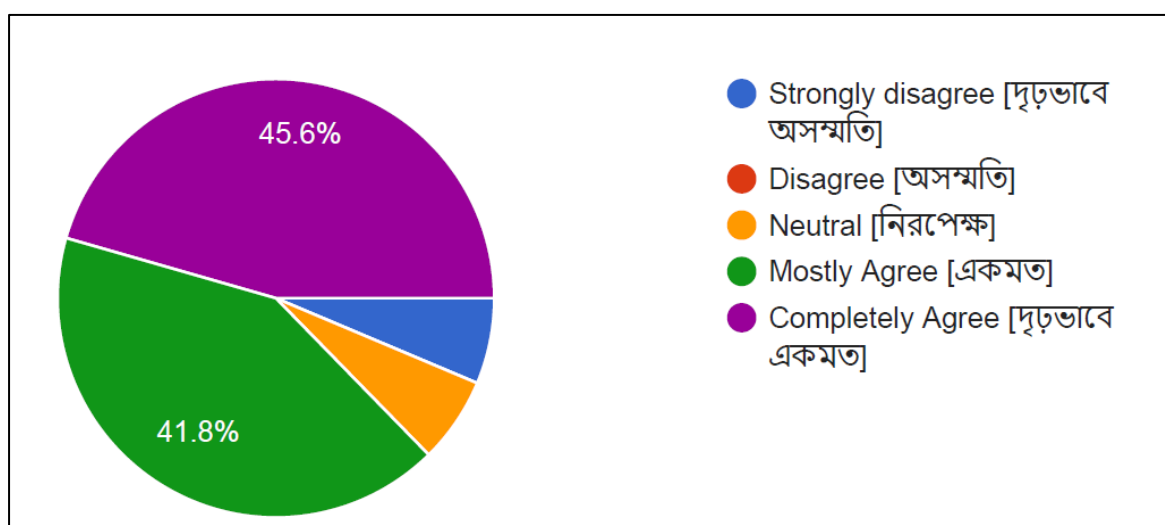

Figure 12: Overtaking tendency on roads responsilbe to accident responsible to accident

We can see there is a tendency of overtaking on the road. Which is one of the causes of accidents. About 87.4% people think so. But 6% people do not support it as a cause of accidents. The remaining 6.6% people were neutral.
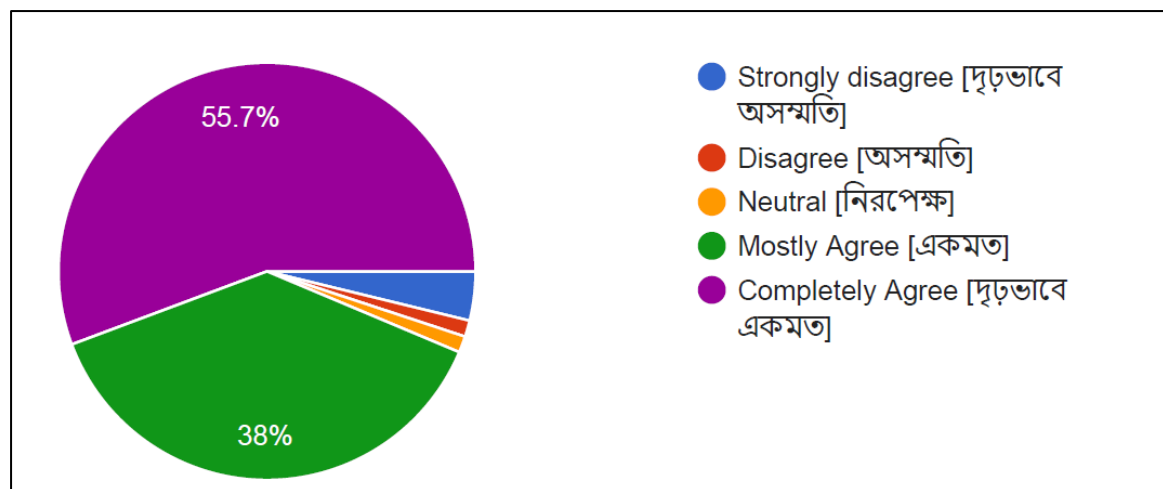

Figure 13: Competitive riding on roads between bikers responsible to accident

The graph above shows that most people agree that competitive behavior among bikers is one of the causes of motorcycle accidents. About 93.7% people agree with this. Among which about 55.7% people strongly agreed and 38% people agreed. Only 6.5% people felt that it had nothing to do with bike accidents and about 0.8% people were neutral about it.

Case study 01:

Imdiaz Nahid. Age 24 years. Studied at Rajshahi University. His family members are 3 people. 1 man is a woman. One of the breadwinners of the family.

15, January, 2020 - Imtiaz Nahid and his 5 friends left for Dinajpur on 3 bikes. They took part in a bike competition among themselves at Manda Ferry Ghat in Naogaon. And after going some distance, Imtiaz Nahid lost control due to excess speed and hit a log and fell to the ground. His bike is thrown far away. Whenever he loses gen. The witness and his friends treated him with first aid.

Although his physical damage was not so much, the front part of the bike including pitson, engine was damaged which cost him 60,000 taka to repair.
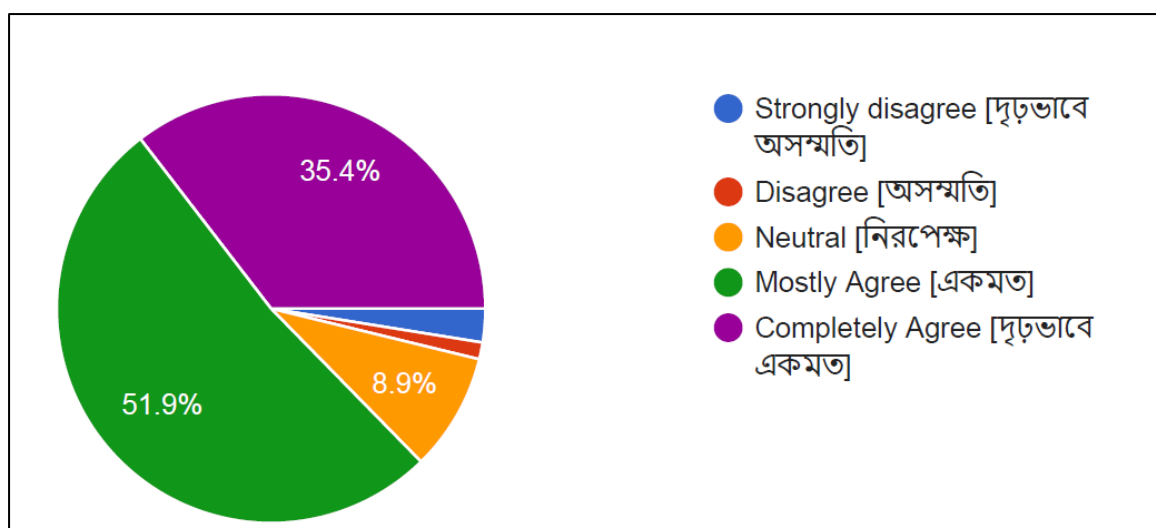
Figure 14: Traffic law disregard of bikers responsible to accident

Ignoring traffic laws by bikers is a major cause of bike accidents in Bangladesh. Not only bikers but many car drivers are seen ignoring traffic laws.

As can be seen from the above chart, how reasonable is the disregard of traffic laws by bikers as a cause of bike accidents. In this case, the answers given by the informants are - 51.9% agree, 35.4% strongly agree and 5% disagree, 4% strongly disagree. Besides, 9% were neutral.
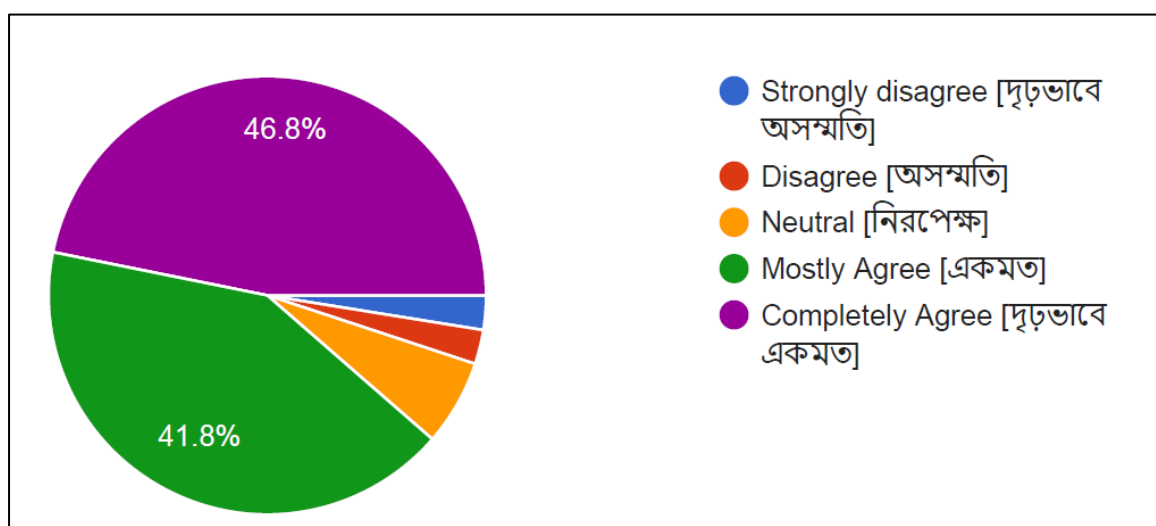

Figure 15: Riding inexperience of motorbikers responsible to accident

If there is no experience in driving any vehicle then it is normal to have an accident. The informants gave their opinion on this matter, 41.8% agreed, 46.8% strongly agreed, 5% disagreed, 5% strongly disagreed, 6.3% were neutral.

So from the graph it can be seen that the inexperience of the driver is largely responsible for motorbike accidents

According to the data from the practice, the inexperience of motorbike drivers is largely responsible for motorbike accidents.
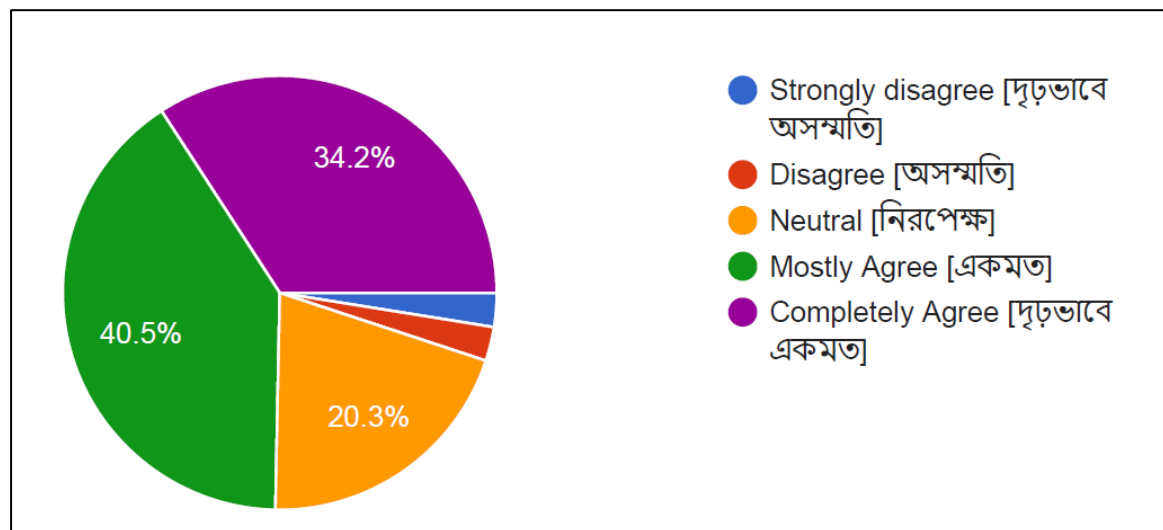

Figure 16: Over confidence of the motorbikers responsible to accident

Many times accidents happen when motor bikers overconfidently want to overtake other vehicles and get ahead of other vehicles due to over-congested roads. 40.5% agreed, 34.2% strongly agreed, 5% disagreed and strongly disagreed and 20.3% were neutral.
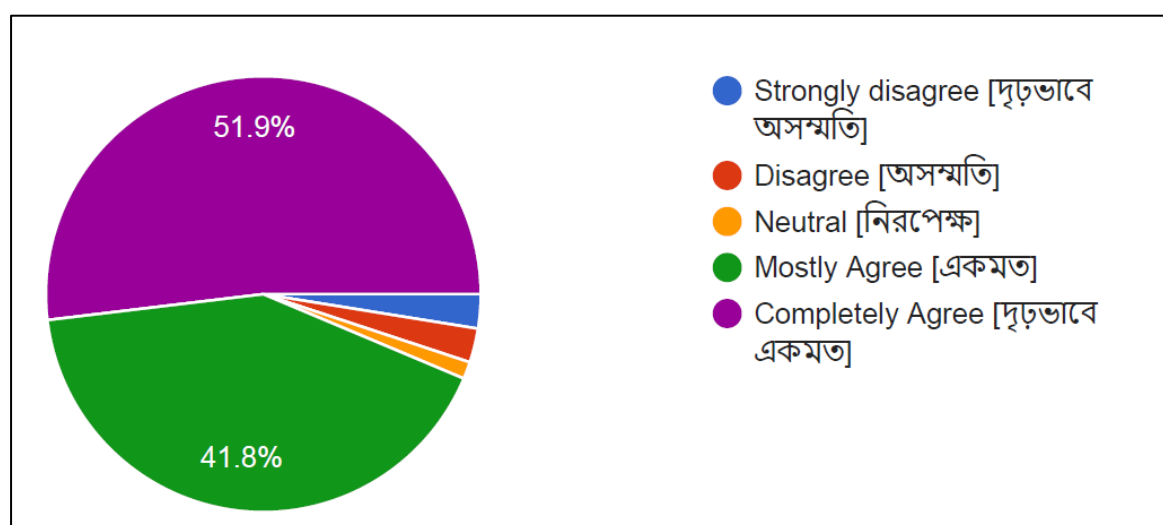

Figure 17: Over speed driving in roads responsible to accident

Looking at the above proof, it can be seen that speeding of car/motorcycle on the road is the cause of motorbike accidents. 51.9% of the informants strongly agreed, 41.8% gave some opinion, 4.7% disagreed and 5% strongly disagreed and 4.8% had no opinion.
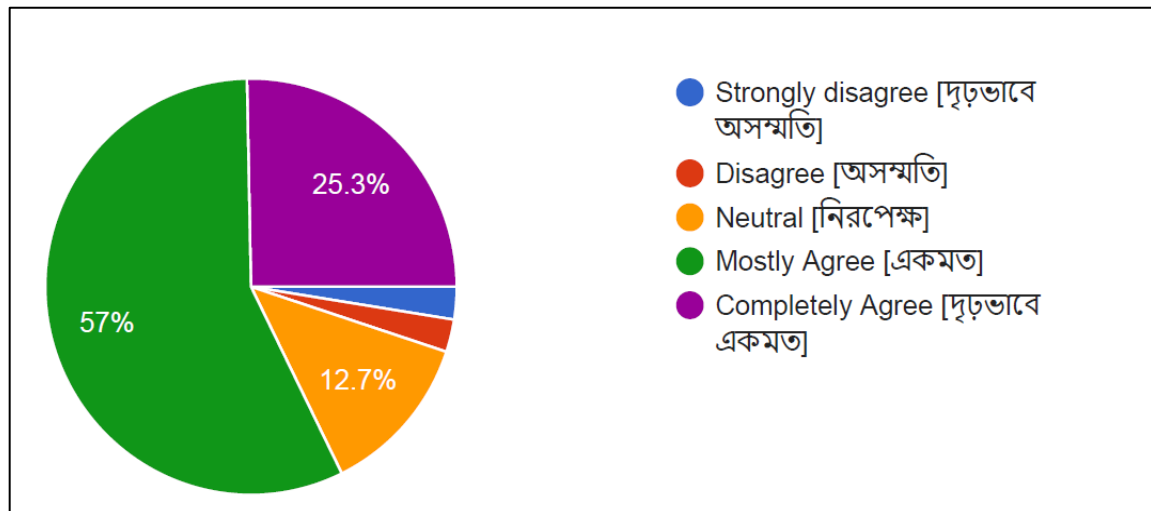

Figure 18: Panic braking due to inadequate road space for maneuvering in high traffic density responsible to accident

Panic braking due to inadequate road space for maneuvering in high traffic density is also responsible to accident. According to the respondent about 57% of them are agreed with this matter, where 25.3% are completely agreed with that. 12.7% of them are being neutral here and a small amount of voter are not agreed with this topic.

Case Study 2:

Fahim Teyebi a 27 years old man who works in a IT firm has four members in his family. Two of them are male and others are female. His family has only one earner. He is unmarried.

Description of the accident:

On 27 September, 2022, He left home for office in the morning by motorbike. On the way to his office another motorbike from the opposite direction hit him hard on the Bypass road of Rajshahi Metropolis. Immediately he fell down with his bike. The pedestrians took him to the Rajshahi medical college hospital. The X-ray report showed that he had fractured his left wrist and thumb. His bike was damaged as well.

Description of Corrosion Damage: Bone plaster, operation and medicine costs approximately 35000/- and 25000/- spent on bike repairing. He took almost a month to

fully recover. During this period he lost his salary because he stayed at home and this costs him a loss of almost 40000/- . So his total financial loss due to this accident is about 1 lakh taka. Due to this his family faced debt.
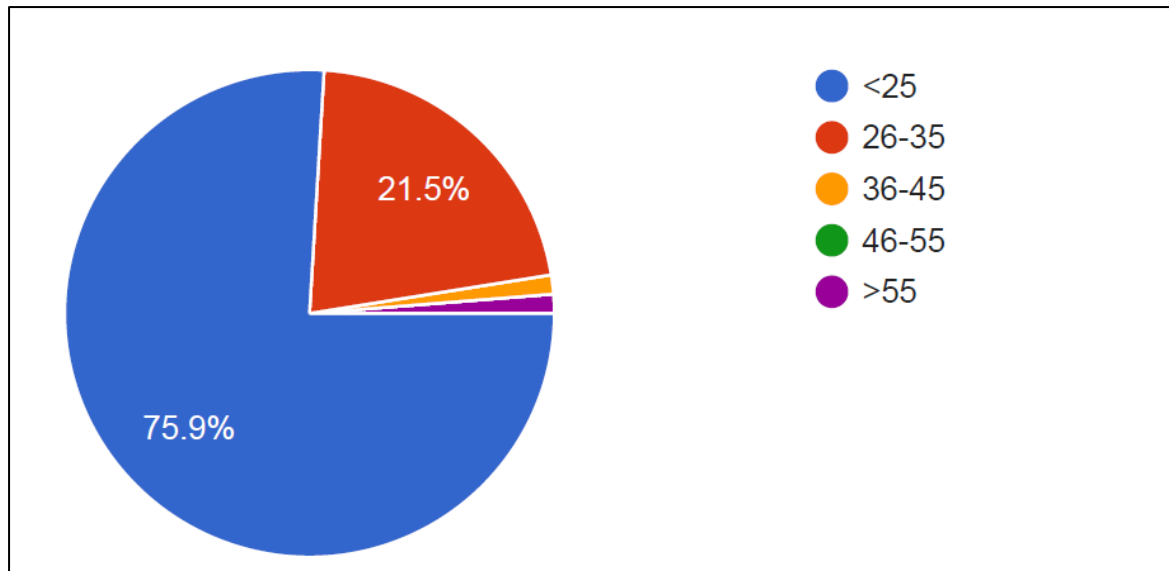

Figure 19: Accident prone motorbike driver's age limit according to respondent

Nowadays motorbike accidents have increased tremendously in our country. Every day some lives are lost somewhere, some are injured. So in this case, if you want to know about the age limit of bikers, it can be seen that the age limit is below 25, 75.9%, 21.5% and 4% between 26 and 35. Below 55 and 3% between 36 and 45. That is, from the above graph, it is understood that the youth below 25 are admitting to more accidents.
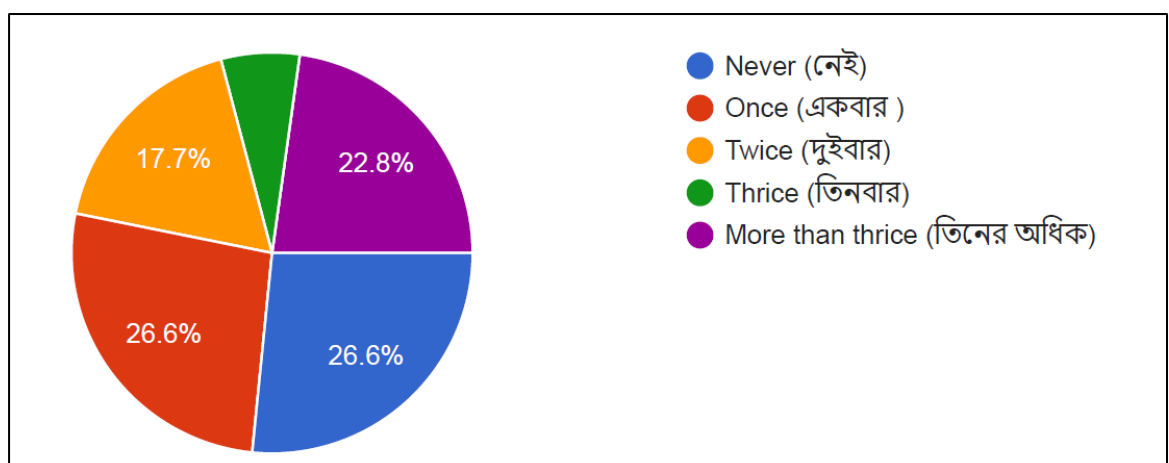

Figure 20: Respondents involvement or experience of noticing motorcycle accident history

The above graph captures the informant's experience of owning a motorcycle accident or witnessing another's motorcycle accident. In this case, 22.8% said they saw more than three

times, 6.3% said they saw it three times, 17.7% said they saw it twice, 26.6% said they saw it once, and 26.6% said they had no experience at all. However, from this information, we can say that the motorcycle accident is very high.
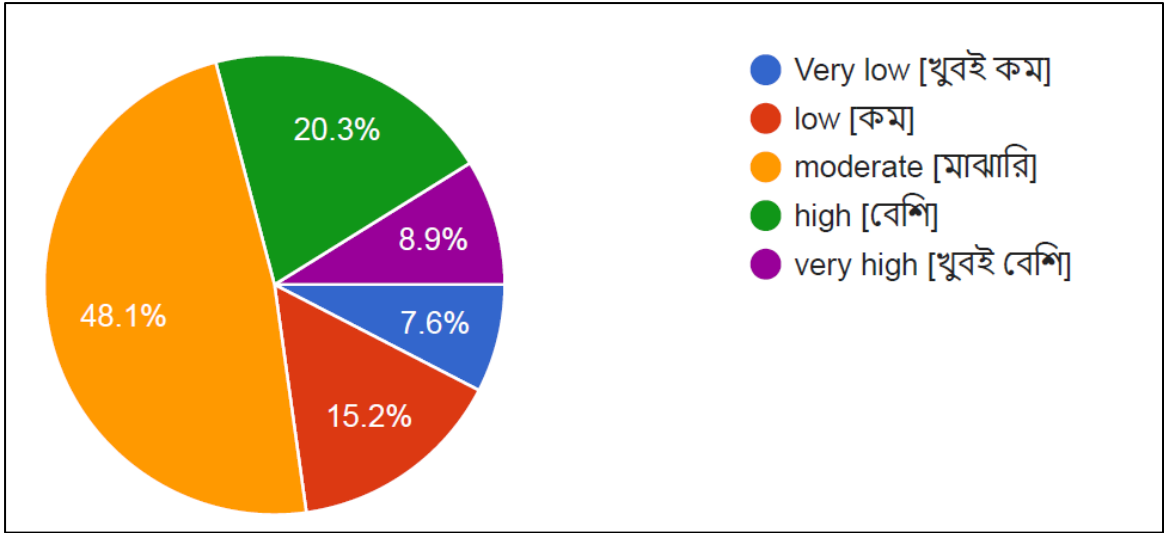

Figure 21: Impact of rainy & stormy weather, flooding in bike accident

The graph above shows that the respondents gave their opinion on the degree of influence of waterlogging, rain and stormy weather as a cause of the accident. , said it is very low and 48.1% said moderate. Accidents are less in this case.
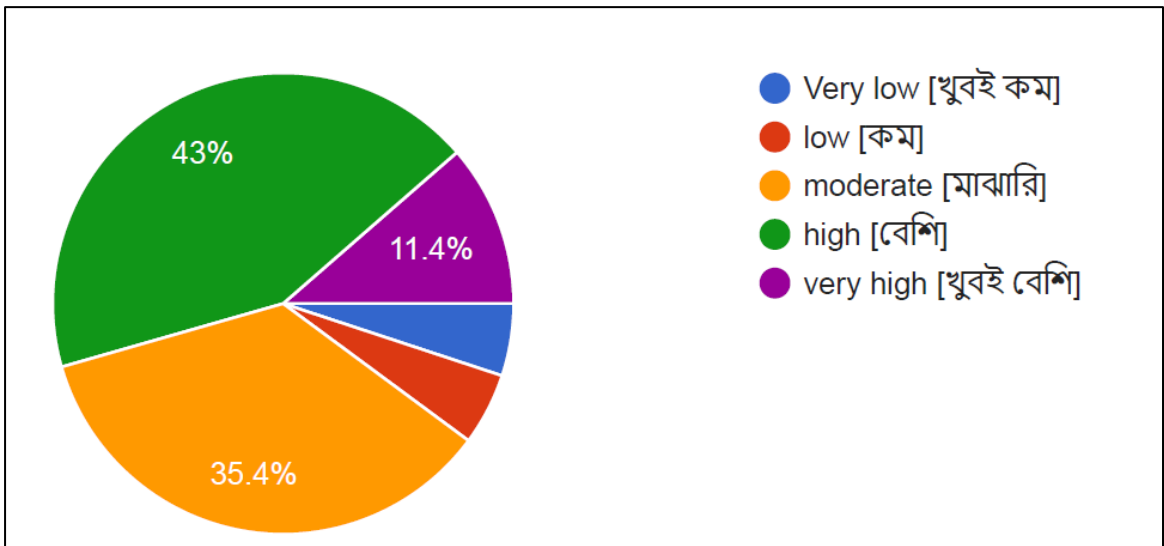

Figure 22: Impact of foggy weather & dust filled surroundings in bike accident

The effects of foggy weather and dusty environment are much more responsible for accidents. Fog makes it difficult for drivers to see around or other vehicles in front of them

or it becomes blurry, which increases the chances of an accident. The above graph shows that 43% said high, 11.4% said very high, 5.1% said very low and 6% said low. Also 35.4% said it occurs moderately or often.
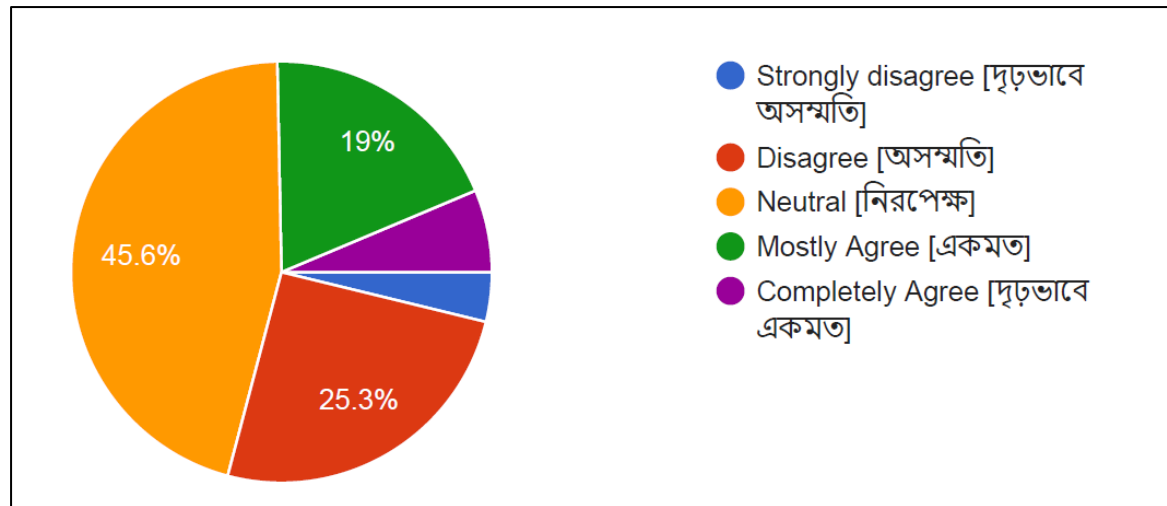
Figure 23: Accidents rise during very high ambient temperature

Accidents often occur at high temperatures. 19% of the informants agreed, 6.3% strongly agreed, 25.3% disagreed, 6% strongly disagreed and 45.6% people were totally neutral on the topic.

From this data, it can be said that there are two levels of altitude very rarely. But sometimes it can happen suddenly.

Figure 24: Pavement surface quality loss due to distress (cracking, undulations, depressions, patchwork and potholes), gravel, cut, fill, unfinished repair, wet, slippery roadway, drainage disruptions, unmaintained road surface, open roadside drainag

The graph above shows the impact of deterioration of road surface quality such as cuts, unevenness, ruts, potholes, potholes, ruts, cuts, unfinished repairs, wet, 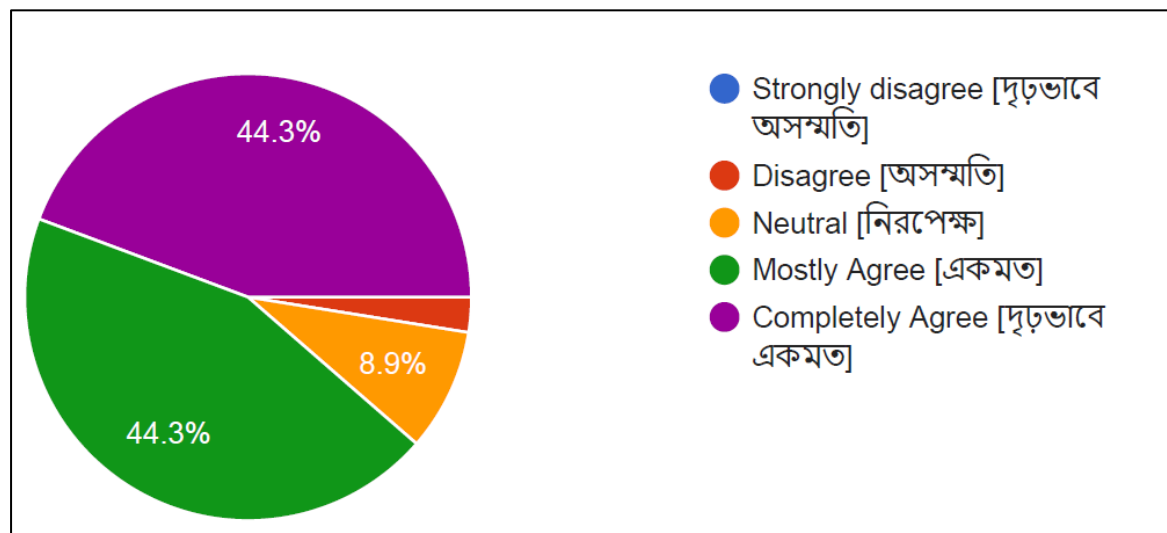slippery roads, disturbed drainage system, open road drainage as the causes of accidents. In this regard, 44.3% of the informants agreed, 44.3% strongly agreed, 5% disagreed and 8.9% were reluctant to give an opinion.

Figure 25: Lack of lighting at roads, links, intersections
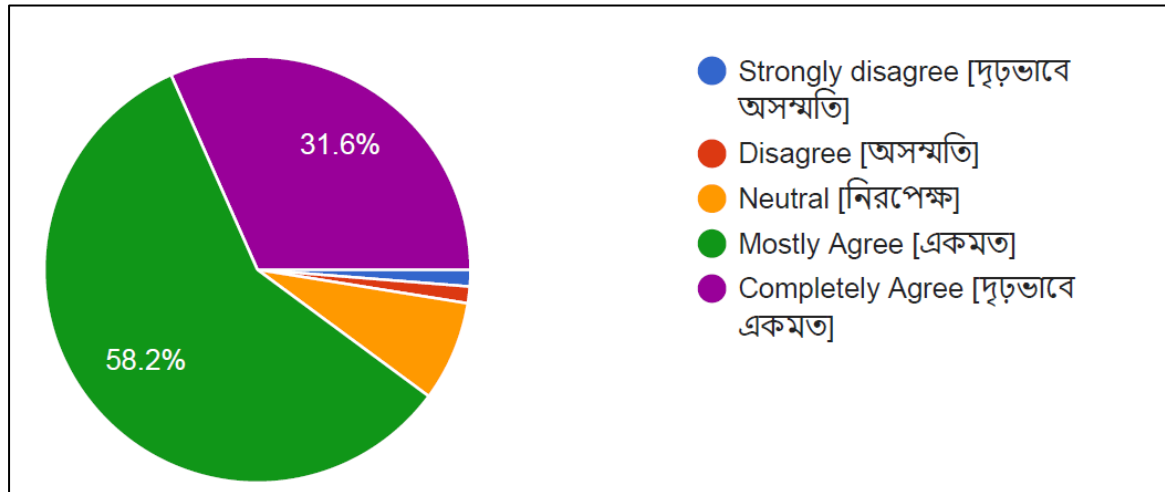
Many times there is a possibility of accidents if there is lack of light at road junctions and road junctions. When asked the opinion of the informants, 58.2% agreed, 31.6% strongly agreed, 4% disagreed and strongly disagreed. Besides, 7.6% were neutral.
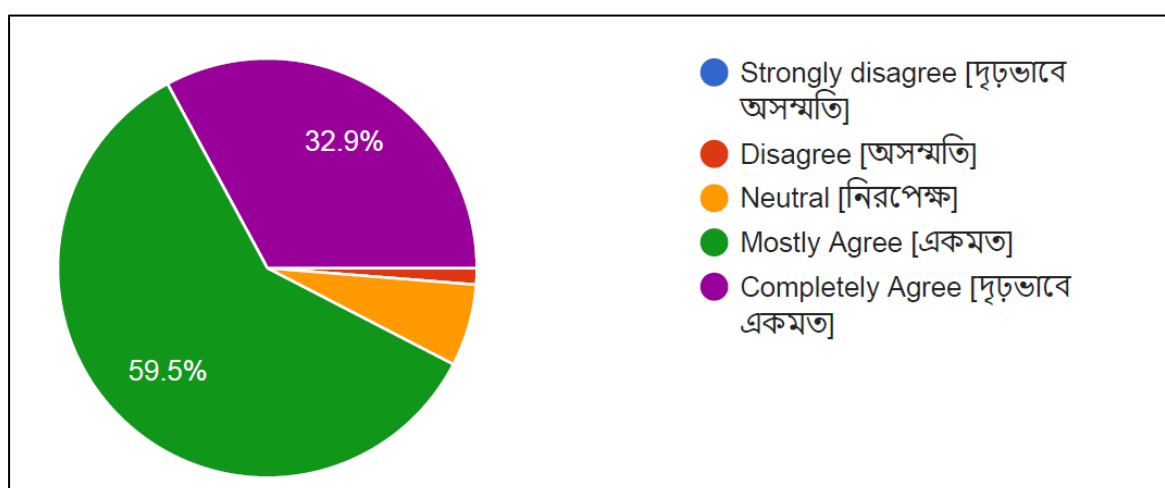
Figure 26: Problematic, unmanaged, unplanned intersection, lack of traffic police, signal, traffic control device

The graph above shows the cause of bike accident for problematic, unmanaged, unplanned intersection, lack of traffic police, signal and traffic control device. 32.9% of people completely agreed on this where 59.5% mostly agreed on it. 1.5% were disagreed and the rest 6.1% were neutral.
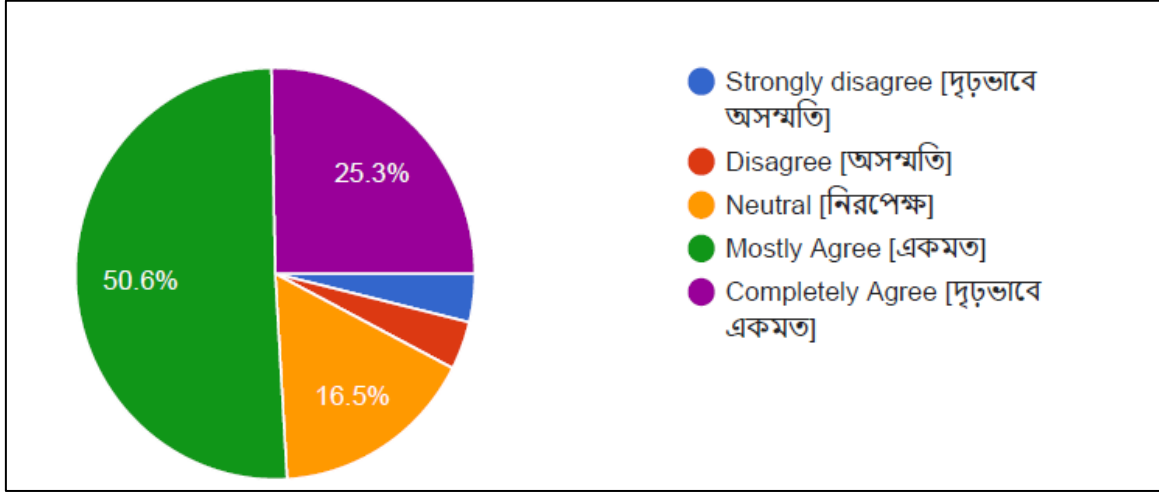
Figure 27: Unsmooth transitions in vertical alignment (i.e. entry or exit of flyover or ramp)

From the above graph, it can be seen that 50.6% agreed, 25.3% strongly agreed and 5% disagreed, 4.9% strongly disagreed as the cause of the accident due to uneven transition at the flyover or ramp entry or exit. Besides, 16.5% were neutral.
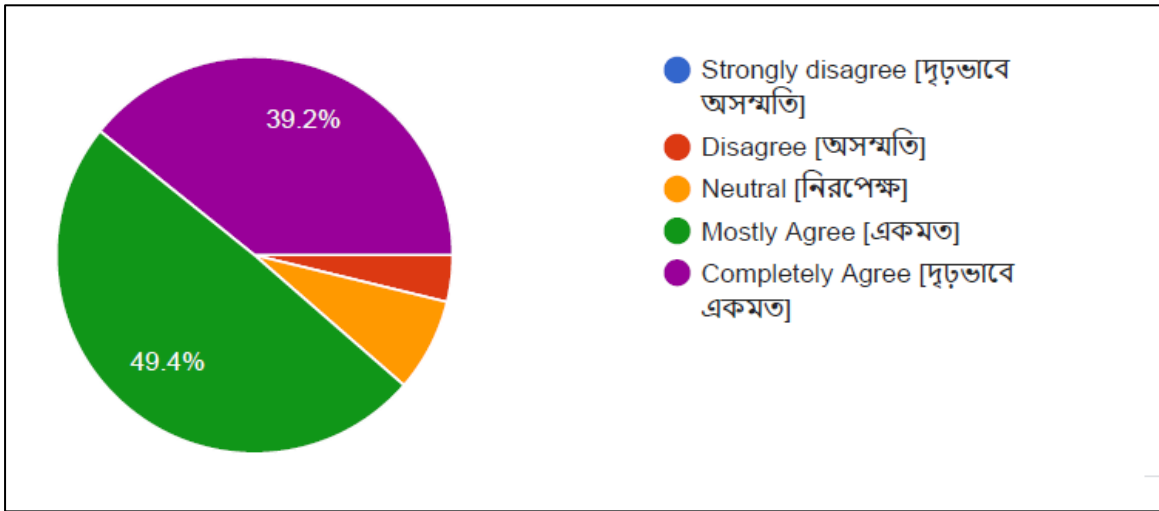
Figure 28: Accident prone turn, bend, curve responsible to bike accident

There are a few bends seen at different corners of the road. These types are very risky for accidents.

The above chart shows that when the informants were asked about accident prone bends 49.4% agreed, 39.2% strongly agreed and 6% disagreed. Besides, another 7.6% informants were neutral.
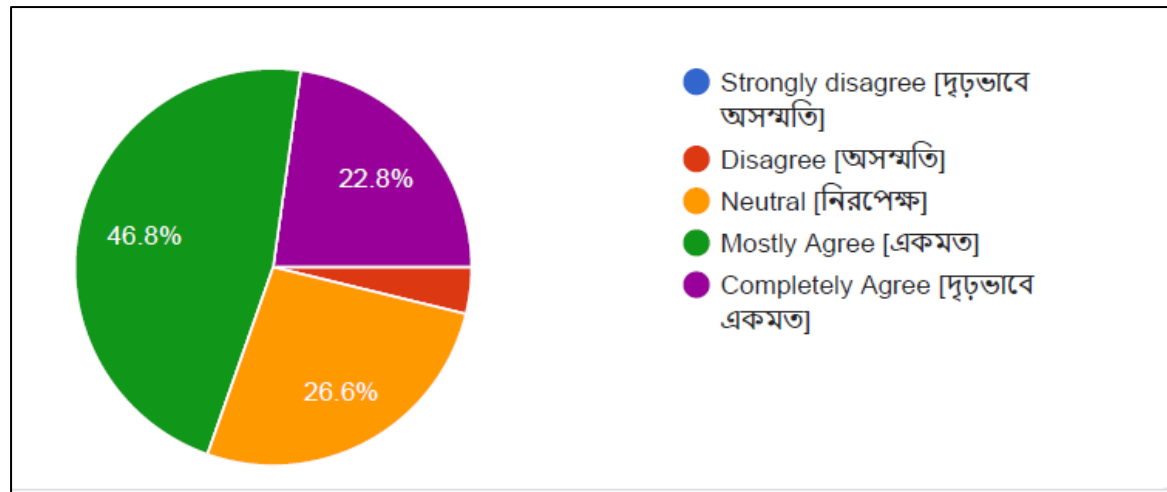
Figure 29: Accident prone regions: flyover, bridge, culvert roadway responsible to bike accident

Due to the presence of flyovers, bridges and culverts between the roads, accidents are more noticeable in these places. On flyovers and bridges, vehicles face accidents at various times while climbing up from low places or coming down from high places. The extent to which the informants felt they were relevant to the cause of the accident was reported in several steps.

46.8% agreed, 22.8% strongly agreed and 7% disagreed and 26.6% people were neutral.
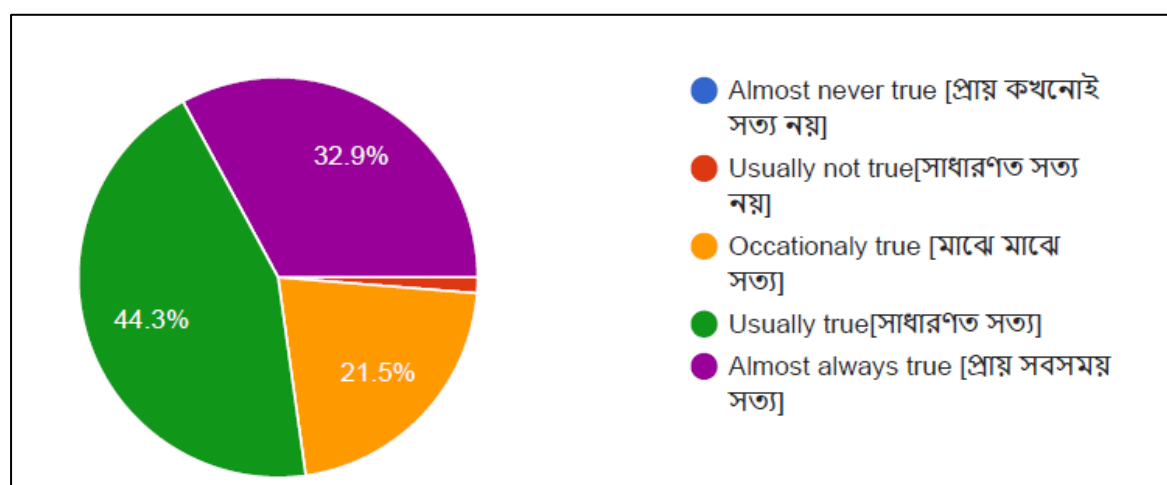
Figure 30: Lack of sign, markings, poorly marked curves, unmarked lane changes responsible to bike accident

Lack of signals, markings, unmarked curves, unmarked lane changes are not enough to cause accidents. Due to these factors the probability of accidents is very high and accidents happen excessively. When the informants were asked how applicable these factors were to the causes of the accident, 44.3% attributed the factors as generally true, 32.9% attributed the factors as appropriate, 21.5% indicated that they occur or occur occasionally, and 4% related to these factors. He said there is no chance of an accident.

However, from this information, it is understood that the causes are very responsible for the accident.
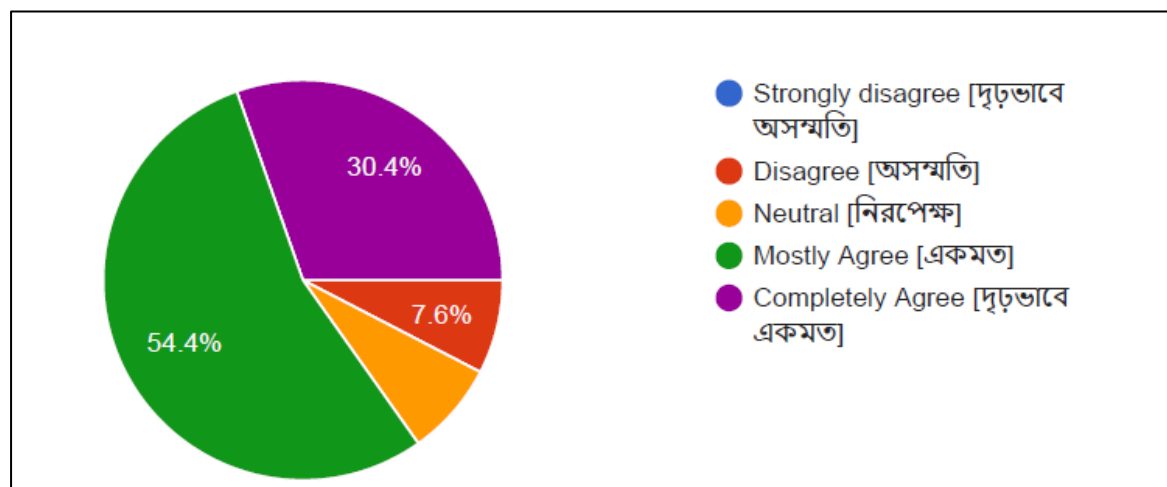
Figure 31: Lack of divider, median, guardrails responsible to bike accident

Lack of lane separation and guardrails seen mostly on high roads in our country are more prone to accidents. Accidents can occur on any road, not just high roads. Considering this, when respondents were asked about the impact of lane separation and lack of guardrail on accidents, 54.4% agreed, 30.4% strongly agreed and 7.6% did not attribute the two factors to accidents. And another 7.6% people played the role of being neutral.
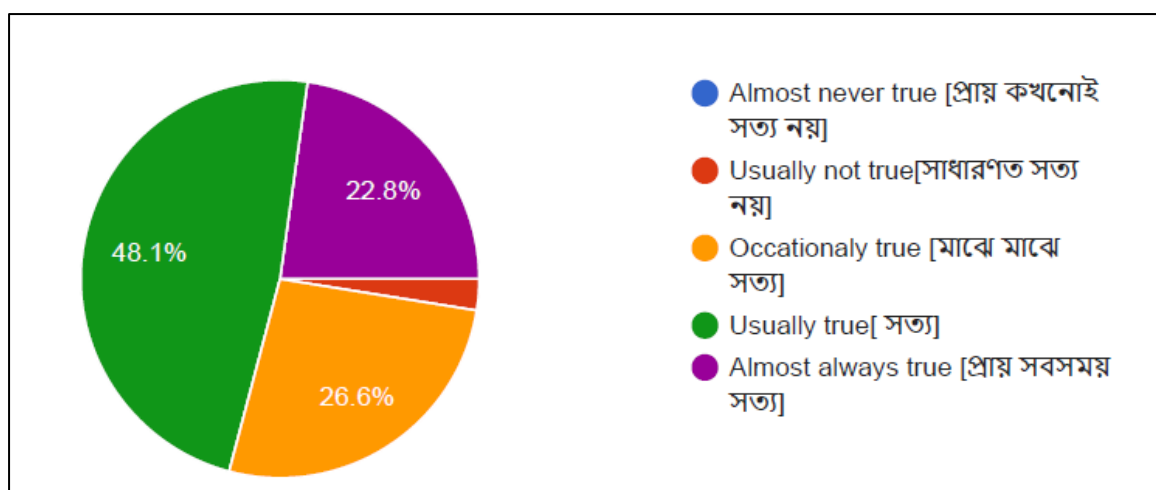
Figure 32: impact of sharing same roadway with other road users of different vehicles on motorbike accident means non lane based heterogeneous traffic movement responsible to bike accident

Sometimes before the accident, it is seen that different types of vehicles are moving side by side in the same lane, one vehicle overtaking another vehicle and facing an accident. When asked the opinion of the informants about the effect of sharing the same lane with other vehicle users on motorbike accidents, 48.1% said it happens, 22.8% people mentioned it as a reason, 26.6% said it happens sometimes, 5% people said it happens. He explained that it does not have much effect as a cause of motorbike accidents.
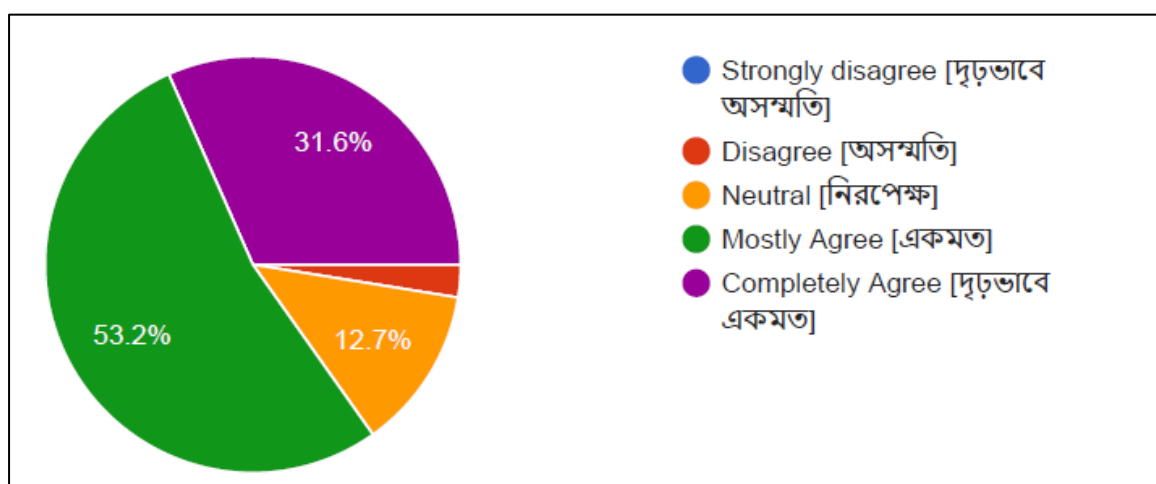
Figure 33: On street parking, insufficient parking space, unexpected opening of car doors, bus stops, roadside frictions (e.g. pedestrian movements and non-motorized vehicles)

53.2% somewhat disagreed on the extent to which on-street parking, expected opening of vehicle doors, bus stops, pedestrian traffic and non-motorized vehicles could be responsible

for the accident, 31.6% strongly attributed the factors to the accident, 12 .7% were neutral or did not give an opinion and 10% people disagreed with the factors as the cause of the accident. From this information it can be said that these factors are responsible for most of the accidents.
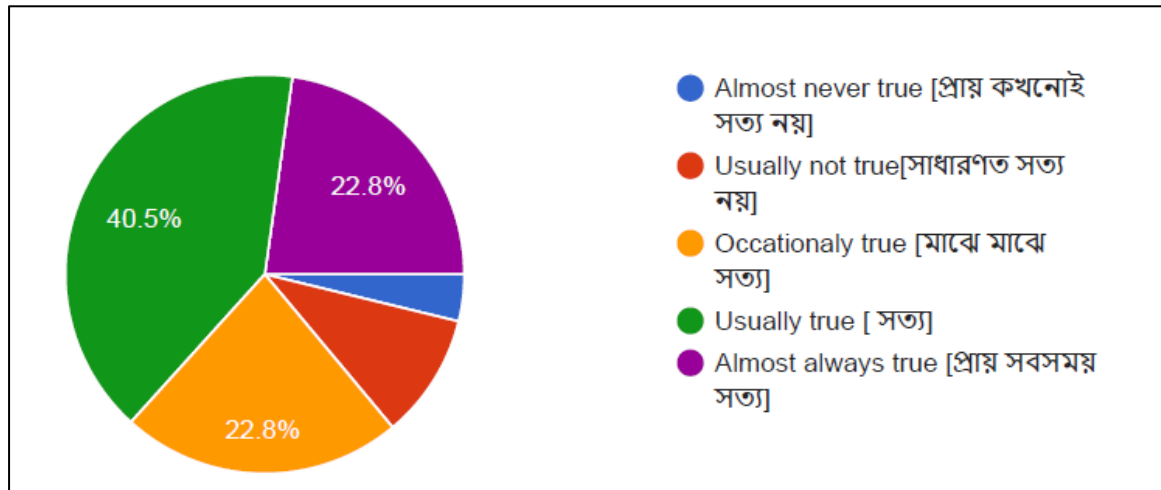
Figure 34: Bike is the most accident prone transportation mode in Bangladesh

All types of vehicles have more or less accidents in Bangladesh. However, motorcycle accidents are the most common at present. When respondents were asked for their opinion about motorbikes being the most accident-prone mode of transport in Bangladesh, 40. 5% usually true, 22.8% accepted it, 22.8% said it sometimes occurs, 10.1% generally not true, and 5% strongly disagreed with motor bike accidents being the most accident prone form of transportation. Such information is available.
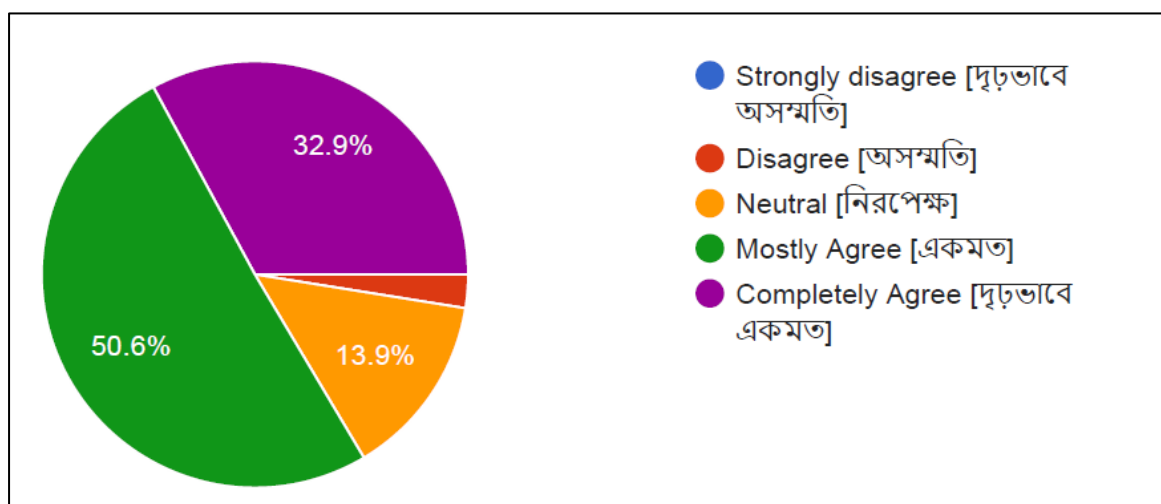
Figure 35: Unauthorized, unprotected rail level crossing with unsmooth/lack of pavement

on railway line for vehicles, obstructed vision problems due to temporary structures, small stall, planting etc

Accidents are more likely to occur if there are unauthorized, unprotected rail label crossings, unevenness or lack of bituminous or concrete roads on the railway tracks for vehicles, temporary structures, small stalls, trees etc. during traffic. These factors are related to how likely accidents are to informants. The above graph shows that 32.9% strongly agree, 50.6% generally agree and 5% disagree and 13.9% are neutral.

From this information, it can be said that these factors are more likely to cause accidents.

Chapter Six

Recommendation and Conclusion

6.1 Recommendation

The majority of the report's flaws have been identified and prioritized, leaving only the responsibility of proposing a solution to help mitigate bike accidents. The techniques for solving the problems had been established, but due to a lack of education, awareness, or other factors, the execution was insufficient to reduce bike accidents.

Based on the summary of the findings stated above on the number of road accidents, the government will reduce the number of instances to the bare minimum if the following recommendations are considered.

i. Stakeholder knowledge of road safety issues and their social and economic consequences is growing: The government will need to increase its efforts to raise stakeholder knowledge of road safety issues and their social and economic consequences.

ii. Undertake a thorough inspection: Review the vehicles' condition and drivers' license on a regular basis. Traffic laws should be applied with such rigor that they are difficult to crack.

iii. Accident-prone areas should be properly defined, and appropriate traffic signs should be installed to warn road users, especially drivers, of imminent accident-prone areas.

iv. Traffic injuries can be minimized by installing zebra crossings, footpaths, pedestrian guard rails, and overpasses, among other items. To minimize the sufferings, unique schemes should be introduced to inform the local public about traffic laws and regulations.

v. All drivers should undergo proper training. Since buses are generally on the road all day, alternate driver arrangements should be made.

vi. Since head-on collisions result in more deaths than any other form of crash, medians should be enforced to minimize head-on collisions

vii. Proper sign-signal labeling can help to minimize the accident rate.

viii. Studies indicate that in the vast majority of cases, convicts have managed to flee the scene of the accident as well as the sentence. Efficient law enforcement can help to reduce accident rates. The number of highway and traffic cops, as well as their vehicles, should be increased.

ix. Constructed road links and management and existing roads should be extended and one-way traffic added. Pavements and highways must be kept clear of development.

x. Ensure one way road: Roads should use divider and all the vehicles will follow the one way lane. In this system there will be no effect of traffic noise and will be less air pollution. Traffic Safety Possible decrease in pedestrian crashes. Separates pedestrians and vehicles. Very effective at reducing pedestrian/vehicle conflicts.

xi. Ensure punishment for breaking the traffic law: Most of the bike accidents are occur due to not following the traffic law. So it's should be ensure to proper monitoring and implement the rules of law.

xii. Establish new authority for looking after the road safety: Some authority should be provided by the government and also some non-government sector need to be provided to ensuring the road safety like "Nirapad Sarak Chai", "Jatri Odhikar Andolon" etc.

xiii. Control over the selling and buying bike through checking license

xiv. Uproot corruption from BRTA

xv. Fixed age limit for driving bike

6.2 Conclusion

Being a convenient mode of transport, motorcycle is continuing to play a great role in the transport sector of Bangladesh. Hence, motorcycle crashes and fatalities are going to be an alarming issue unless the safe mobility of motorcyclists can be ensured. This study has put some insights into facts, causes and behavioral aspects of motorcyclists. The safe road infrastructures, speed management strategies, safety awareness and behavior of motorcyclists should be considered by road planners, designers, engineers and respective agencies. Moreover, mitigating underreporting problems will definitely play a greater role in motorcyclists' safety research, plan, design and implementation of the above strategies. In conclusion, as the above research and interpretation, bike accidents in Bangladesh are not eliminated completely. It will need to be evaluated on a regular basis by other researchers as the transportation system phase and city master plans evolve through time. As a result, research must be performed on a regular basis as the urbanization paradigm progresses, and solutions to challenges must be sought by introducing new systems that the century brings.

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Appendix

বাংলাদেশের মোটরসাইকেল দুর্ঘটনার কারণ অনুসন্ধান: রাজশাহী বিভাগের চার জেলার উপর সমীক্ষা

(আপনার মূল্যবান সময়ের ৫ মিনিট ব্যয়পূর্বক দুর্ঘটনা নিরসনে এই জরিপে আপনার সক্রিয় অংশগ্রহণ এবং অবদান অত্যন্ত প্রশংসনীয় বলে বিবেচ্য ।একইসঙ্গে আপনার দেওয়া **তথ্যের গোপনীয়তা** নিশ্চিত করা হচ্ছে।)

Md. Ashraful Islam
12th Semester, Political Science, Varendra University

*Required

1. Your name (নাম)-

   _____

2. Your Gender (লিঙ্গ) - * *

   Mark only one oval.

   ◯ Male (পুরুষ)

   ◯ Female (নারী)

   ◯ Prefer not to say (বলতে ইচ্ছুক নই)

3. Age (years) *
বয়স (বছর)

Mark only one oval.

⬭ 10-18

⬭ 19-25

⬭ 26-35

⬭ 36-45

⬭ 45-60

⬭ > 60+

4. District of Bangladesh you reside :   *
(আপনি যে জেলায় বসবাস করছেন-)

Mark only one oval.

⬭ Rajshahi (রাজশাহী)

⬭ Natore (নাটোর)

⬭ Chapainawabganj (চাপাইনবয়াবগঞ্জ)

⬭ Naogaon (নঁওগা)

5. Your usage of motorbikes-   *
(মটরসাইকেল ব্যবহারের ধরণ-)

Mark only one oval.

⬭ Rider/ Driver (মটরসাইকেল চালক)

⬭ User but not driver (মটরসাইকেল ব্যবহারকারী কিন্তু চালক নয়)

⬭ Non users (মটরসাইকেল ব্যবহারকারী নয়)

6. Your occupation *
   (আপনার পেশা-)

Mark only one oval.

- ◯ Government emplyee (সরকারি চাকরি)
- ◯ Private employee(বেসরকারি চাকরি)
- ◯ Self employment (আত্মকর্মসংস্থান)
- ◯ Student (ছাত্র/ছাত্রী)
- ◯ Unemployed(বেকার)

7. People use bike most often in Bangladesh according to you: *
   (আপনার মতে কোন কোন ক্ষেত্রে মটরসাইকেল সবচেয়ে বেশি ব্যবহৃত হয়?)

Mark only one oval.

- ◯ Occupation purpose(চাকরীক্ষেত্রে, ব্যবসাক্ষেত্রে)
- ◯ School, college, educational activity (স্কুল, কলেজ, শিক্ষাকার্যক্রমসংক্রান্ত যাতায়াত)
- ◯ Social activity, Recreational purpose (সামাজিক কর্মকাণ্ড, বিনোদনমূলক উদ্দেশ্য)
- ◯ Shopping (কেনাকাটা)
- ◯ Other:

Survey on drivers' attitude, approach, vehicles' condition, crash/conflict record history

Do you think the factors(major clustered as drivers' attitude, approach, vehicles' condition, pedestrian movement, crash/conflict record history) below are more impactful on motorbike accidents in the context of Bangladesh? **Please rate the following factors** according to your experience :

[বাংলাদেশের প্রেক্ষাপটে **মোটরবাইক দুর্ঘটনায় নিচের কারণগুলির** (চালকের মনোভাব, দৃষ্টিভঙ্গি,পদক্ষেপ, যানবাহনের অবস্থা, পথচারীদের চলাচল, দুর্ঘটনা/সংঘাতের রেকর্ডের ইতিহাস হিসাবে প্রধান ভাগ) **মাত্রা যাচাই।**অনুগ্রহ করে আপনার অভিজ্ঞতা অনুযায়ী **মোটরবাইক দুর্ঘটনায়** নিম্নলিখিত বিষয়গুলোর **মাত্রা মূল্যায়ন করুন** :]

55

8. **More CC** of motorbikes is more impactful in more motorbike accident ?   *
   (**অধিকতর সিসি র** মটরবাইক ,মোটরবাইক দুর্ঘটনায় বেশি প্রভাব ফেলে?)

   Mark only one oval.

   ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

   ◯ Disagree [অসম্মতি]

   ◯ Neutral [নিরপেক্ষ]

   ◯ Mostly Agree [একমত]

   ◯ Completely Agree [দৃঢ়ভাবে একমত]

9. **Mechanical problems** of the bike (e.g. brake, tire, broken mirror, indicator problem, lack   *
   of fitness):
   (**যান্ত্রিক ত্রুটি** যেমনঃ ব্রেক, টায়ার, লুকিং গ্লাস, ইন্ডিকেটর, ফিটনেস ইত্যাদি জাতীয়
   সমস্যা-)

   Mark only one oval.

   ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

   ◯ Disagree [অসম্মতি]

   ◯ Neutral [নিরপেক্ষ]

   ◯ Mostly Agree [একমত]

   ◯ Completely Agree [দৃঢ়ভাবে একমত]

10. **Mobile phone** usage, video making, music, talking during riding : *

(বাইক চালানোর সময় **মোবাইল ফোন** ব্যবহার, ভিডিও রেকর্ডিং, কথা বলা:)

Mark only one oval.

⬭ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

⬭ Disagree [অসম্মতি]

⬭ Neutral [নিরপেক্ষ]

⬭ Mostly Agree [একমত]

⬭ Completely Agree [দৃঢ়ভাবে একমত]

11. **Overloading** of the bike(e.g. more than 2 people on a bike, loaded with other heavy loads): *

[বাইকের **ওভারলোডিং** (যেমন একটি বাইকে 2 জনের বেশি লোক, অন্যান্য ভারী লোড সহ যাতায়াত):]

Mark only one oval.

⬭ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

⬭ Disagree [অসম্মতি]

⬭ Neutral [নিরপেক্ষ]

⬭ Mostly Agree [একমত]

⬭ Completely Agree [দৃঢ়ভাবে একমত]

12. Drug, alcohol, psychoactive substance **addiction**, **suicidal tendencies** of riders: *
[মাদক, অ্যালকোহল **আসক্তি**, রাইডারদের **আত্মহত্যার প্রবণতা**:]

Mark only one oval.

- ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
- ◯ Disagree [অসম্মতি]
- ◯ Neutral [নিরপেক্ষ]
- ◯ Mostly Agree [একমত]
- ◯ Completely Agree [দৃঢ়ভাবে একমত]

13. **Overtaking** tendency on roads: *
[রাস্তায় **ওভারটেকিং** প্রবণতা :]

Mark only one oval.

- ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
- ◯ Disagree [অসম্মতি]
- ◯ Neutral [নিরপেক্ষ]
- ◯ Mostly Agree [একমত]
- ◯ Completely Agree [দৃঢ়ভাবে একমত]

14. **Competitive riding** on roads between bikers: *
[বাইকারদের মধ্যে রাস্তায় **প্রতিযোগিতামূলক রাইডিং**:]

Mark only one oval.

- ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
- ◯ Disagree [অসম্মতি]
- ◯ Neutral [নিরপেক্ষ]
- ◯ Mostly Agree [একমত]
- ◯ Completely Agree [দৃঢ়ভাবে একমত]

15. Traffic **law disregard** of bikers: *
    [বাইকারদের ট্রাফিক **আইন উপেক্ষা:**]

    Mark only one oval.

    - ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
    - ◯ Disagree [অসম্মতি]
    - ◯ Neutral [নিরপেক্ষ]
    - ◯ Mostly Agree [একমত]
    - ◯ Completely Agree [দৃঢ়ভাবে একমত]

16. **Riding inexperience** of motorbikers: *
    [মোটরবাইক চালকদের **অনভিজ্ঞতা:**]

    Mark only one oval.

    - ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
    - ◯ Disagree [অসম্মতি]
    - ◯ Neutral [নিরপেক্ষ]
    - ◯ Mostly Agree [একমত]
    - ◯ Completely Agree [দৃঢ়ভাবে একমত]

17. **Over confidence** of the motorbikers :   *
    [মোটরবাইক চালকদের **অতিরিক্ত আত্মবিশ্বাস-**]

    Mark only one oval.

    - ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
    - ◯ Disagree [অসম্মতি]
    - ◯ Neutral [নিরপেক্ষ]
    - ◯ Mostly Agree [একমত]
    - ◯ Completely Agree [দৃঢ়ভাবে একমত]

18. **Overspeed** driving in roads :   *

[রাস্তায় **অতিরিক্ত গতিতে** গাড়ি/মোটরসাইকেল চালানো:]

Mark only one oval.

- ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
- ◯ Disagree [অসম্মতি]
- ◯ Neutral [নিরপেক্ষ]
- ◯ Mostly Agree [একমত]
- ◯ Completely Agree [দৃঢ়ভাবে একমত]

19. **Panic braking** due to inadequate road space for maneuvering in high traffic density: *

[উচ্চ ট্রাফিক ঘনত্বের জন্য কম জায়গার কারণে **আতঙ্কিত ব্রেকিং:**]

Mark only one oval.

- ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
- ◯ Disagree [অসম্মতি]
- ◯ Neutral [নিরপেক্ষ]
- ◯ Mostly Agree [একমত]
- ◯ Completely Agree [দৃঢ়ভাবে একমত]

20. According to you, accident prone **motorbike driver's age** limit: *

[আপনার মতে, দুর্ঘটনা প্রবণ **মোটরবাইক চালকের বয়সসীমা:**]

Mark only one oval.

- ◯ <25
- ◯ 26-35
- ◯ 36-45
- ◯ 46-55
- ◯ >55

21. Your **Crash/conflict involvement** or experience of noticing motorcycle accident history :   *
[আপনার নিজের **মোটরসাইকেল দুর্ঘটনার** বা মোটরসাইকেল **দুর্ঘটনা প্রত্যক্ষভাবে লক্ষ্য করার অভিজ্ঞতা:**]

Mark only one oval.

◯ Never (**নেই**)

◯ Once (একবার)

◯ Twice (দুইবার)

◯ Thrice (তিনবার)

◯ More than thrice (তিনের অধিক)

Survey on weather condition, pavement condition, roadway environments, geometric features of roads.	Do you think the factors(major clustered as **weather condition, pavement condition, roadway environments, geometric features**) below are more impactful on motorbike accident in the context of Bangladesh? Please rate the following factors according to your experience : [বাংলাদেশের প্রেক্ষাপটে **মোটরবাইক দুর্ঘটনায় নিচের কারণগুলির** (আবহাওয়ার অবস্থা, রাস্তার অবস্থা, রাস্তার পরিবেশ, জ্যামিতিক বৈশিষ্ট্য হিসাবে প্রধান ভাগ) **মাত্রা যাচাই।**অনুগ্রহ করে আপনার অভিজ্ঞতা অনুযায়ী **মোটরবাইক দুর্ঘটনায়** নিম্নলিখিত বিষয়গুলোর **মাত্রা মূল্যায়ন করুন** :]

22. Impact of **rainy & stormy weather, flooding** :   *
[**জলাবদ্ধতা, বৃষ্টি ও ঝড়ো** আবহাওয়ার প্রভাব:]

Mark only one oval.

◯ Very low [খুবই কম]

◯ low [কম]

◯ moderate [মাঝারি]

◯ high [বেশি]

◯ very high [খুবই বেশি]

23. Impact of **foggy weather & dust filled surroundings** : *
[**কুয়াশাচ্ছন্ন** আবহাওয়া এবং **ধুলো ভরা** পরিবেশের প্রভাব:]

Mark only one oval.

◯ Very low [খুবই কম]

◯ low [কম]

◯ moderate [মাঝারি]

◯ high [বেশি]

◯ very high [খুবই বেশি]

24. 'Accidents rise during very **high ambient temperature'** : *
[**উচ্চ তাপমাত্রায়** দুর্ঘটনা বৃদ্ধি পায়:]

Mark only one oval.

◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

◯ Disagree [অসম্মতি]

◯ Neutral [নিরপেক্ষ]

◯ Mostly Agree [একমত]

◯ Completely Agree [দৃঢ়ভাবে একমত]

25. **Pavement surface quality** loss due to distress(cracking, undulations, depressions, patchwork, potholes), gravel, cut, fill, unfinished repair, wet, slippery roadway, drainage disruptions, unmaintained road surface, open roadside drainage :   *

[রাস্তার **পৃষ্ঠের গুণমান হ্রাস** (ফাটল, অসমতা, জোড়াতালি, গর্ত, খানাখন্দ), নুড়ি, কাটা, অসমাপ্ত **মেরামত**, ভেজা, পিচ্ছিল রাস্তা, **ব্যাহত নিষ্কাশন ব্যবস্থা,রাস্তার খোলা ড্রেনেজ**:]

Mark only one oval.

◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

◯ Disagree [অসম্মতি]

◯ Neutral [নিরপেক্ষ]

◯ Mostly Agree [একমত]

◯ Completely Agree [দৃঢ়ভাবে একমত]

26. Lack of **lighting** at roads, links, intersections: *
[রাস্তা, সংযোগ, মোড়ে **আলোর অভাব:**]

Mark only one oval.

◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

◯ Disagree [অসম্মতি]

◯ Neutral [নিরপেক্ষ]

◯ Mostly Agree [একমত]

◯ Completely Agree [দৃঢ়ভাবে একমত]

27. Problematic, unmanaged, unplanned **intersection, lack of traffic police, signal, traffic control device** :   *
[সমস্যাযুক্ত, অব্যবস্থাপিত, **অপরিকল্পিত মোড়, সংকেত, ট্রাফিক পুলিশের** অভাব:]

Mark only one oval.

◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

◯ Disagree [অসম্মতি]

◯ Neutral [নিরপেক্ষ]

◯ Mostly Agree [একমত]

◯ Completely Agree [দৃঢ়ভাবে একমত]

28. **Unsmooth transitions** in vertical alignment i.e. entry or exit of **flyover or ramp**: *
[ফ্লাইওভার বা র্যাম্পে প্রবেশ বা প্রস্থানে **অমসৃণ স্থানান্তর** -]

Mark only one oval.

◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

◯ Disagree [অসম্মতি]

◯ Neutral [নিরপেক্ষ]

◯ Mostly Agree [একমত]

◯ Completely Agree [দৃঢ়ভাবে একমত]

29. Unauthorized, unprotected **rail level crossing** with unsmooth/lack of pavement on railway line *
for vehicles , obstructed vision problems due to temporary structures , small stall, planting etc :
[অননুমোদিত, অরক্ষিত **রেল লেভেল ক্রসিং**, যানবাহনের জন্য রেললাইনের ওপর
অমসৃণতা / বিটুমিনাস অথবা কংক্রিট রাস্তার অভাব, অস্থায়ী কাঠামো, **ছোট স্টল, গাছ**
ইত্যাদির কারণে চালকের দৃষ্টি সমস্যা/ বাধাগ্রস্ত হওয়া :

Mark only one oval.

◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

◯ Disagree [অসম্মতি]

◯ Neutral [নিরপেক্ষ]

◯ Mostly Agree [একমত]

◯ Completely Agree [দৃঢ়ভাবে একমত]

30. Accident prone **turn, bend, curve**: *
   [দুর্ঘটনা প্রবণ **বাঁক**]

Mark only one oval.

◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

◯ Disagree [অসম্মতি]

◯ Neutral [নিরপেক্ষ]

◯ Mostly Agree [একমত]

◯ Completely Agree [দৃঢ়ভাবে একমত]

31. Accident prone regions: **flyover, bridge, culvert roadway** *
[দুর্ঘটনা প্রবণ :**ফ্লাইওভার, ব্রিজ, কাল্ভার্ট**]

Mark only one oval.

- ◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]
- ◯ Disagree [অসম্মতি]
- ◯ Neutral [নিরপেক্ষ]
- ◯ Mostly Agree [একমত]
- ◯ Completely Agree [দৃঢ়ভাবে একমত]

32. Lack of **sign, markings**, poorly marked curves, unmarked lane changes: *
[**সিগনাল, চিহ্নের অভাব**, অচিহ্নিত বক্র রাস্তা , অচিহ্নিত লেন পরিবর্তন:]

Mark only one oval.

- ◯ Almost never true [প্রায় কখনোই সত্য নয়]
- ◯ Usually not true[সাধারণত সত্য নয়]
- ◯ Occationaly true [মাঝে মাঝে সত্য]
- ◯ Usually true[সাধারণত সত্য]
- ◯ Almost always true [প্রায় সবসময় সত্য]

33. Lack of **divider, median, guardrails** : *
[লেন **বিভাজক, গার্ডরেলের** অভাব:]

Mark only one oval.

◯ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

◯ Disagree [অসম্মতি]

◯ Neutral [নিরপেক্ষ]

◯ Mostly Agree [একমত]

◯ Completely Agree [দৃঢ়ভাবে একমত]

34. Your thinking about impact of **sharing same roadway with other road users of different** *
vehicles on motorbike accident means non lane based heterogenous traffic movement :
[মোটরবাইক দুর্ঘটনায় **অন্যান্য যান ব্যবহারকারীদের সাথে একই লেন ভাগাভাগি করার প্রভাব** সম্পর্কে :]

Mark only one oval.

◯ Almost never true [প্রায় কখনোই সত্য নয়]

◯ Usually not true[সাধারণত সত্য নয়]

◯ Occationaly true [মাঝে মাঝে সত্য]

◯ Usually true[সত্য]

◯ Almost always true [প্রায় সবসময় সত্য]

35. **On street parking**, insufficient parking space, unexpected opening of car doors, **bus stops**, roadside frictions (e.g. pedestrian movements and non-motorized vehicles) : [রাস্তায় **পার্কিং**, গাড়ির দরজা অপ্রত্যাশিত খোলা, **বাস স্টপ**, **পথচারীদের চলাচল** এবং **অ-মোটর চালিত যান:**]   *

Mark only one oval.

⬭ Strongly disagree [দৃঢ়ভাবে অসম্মতি]

⬭ Disagree [অসম্মতি]

⬭ Neutral [নিরপেক্ষ]

⬭ Mostly Agree [একমত]

⬭ Completely Agree [দৃঢ়ভাবে একমত]

Last Section

Overall opinion
[সামগ্রিক মতামত]

36. Do you think **bike is the most accident prone transportation mode in Bangladesh** ?   *
[আপনি কি মনে করেন যে **মটরবাইক বাংলাদেশের সবচেয়ে দুর্ঘটনাপ্রবণ পরিবহন ব্যবস্থা**?]

Mark only one oval.

⬭ Almost never true [প্রায় কখনোই সত্য নয়]

⬭ Usually not true[সাধারণত সত্য নয়]

⬭ Occationaly true [মাঝে মাঝে সত্য]

⬭ Usually true [সত্য]

⬭ Almost always true [প্রায় সবসময় সত্য]

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37. **Optional(ইচ্ছামূলক):::**

Choose **less or equal to 20** out of total factors which you think do the most influence in bike accident ?
[মোট ফ্যাক্টরের মধ্যে **অনূর্ধ্ব ২০টি** বেছে নিন যা আপনার মনে হয় বাইক দুর্ঘটনায় সবচেয়ে বেশি প্রভাব ফেলে?]

Tick all that apply.

☐ More CC of motorbikes (অধিকতর সিসি র মটরবাইক)

☐ Mechanical problems of the bike (যান্ত্রিক ত্রুটি)

☐ Mobile phone usage, music, talking during riding (মোবাইল ফোন ব্যবহার, গান, কথা বলা)

☐ Overloading of the bike(একটি বাইকে 2 জনের বেশি লোক, অন্যান্য ভারী লোড সহ যাতায়াত)

☐ Drug, alcohol, psychoactive substance addiction, suicidal tendencies of riders[মাদক, অ্যালকোহল আসক্তি, রাইডারদের আত্মহত্যার প্রবণতা]

☐ Overtaking tendency on roads[রাস্তায় ওভারটেকিং প্রবণতা]

☐ Traffic law disregard of bikers [বাইকারদের ট্রাফিক আইন উপেক্ষা]

☐ Riding inexperience of motorbikers [মোটরবাইক চালকদের অনভিজ্ঞতা]

☐ Overconfidence of the motorbikers

☐ Overspeed driving in roads [অতিরিক্ত গতিতে গাড়ি/মোটরসাইকেল চালানো]

☐ Panic braking[আতঙ্কিত ব্রেকিং]

☐ motorbike driver's lower age limit [মোটরবাইক চালকের কম বয়সসীমা]

☐ high travel distance[মটরসাইকেল চালকের অধিক ভ্রমণ দূরত্ব (কিলোমিটারে) অতিক্রমে]

☐ pedestrian activity, random pedestrian crossing[পথচারীদের কার্যকলাপের প্রভাব,এলোমেলো পথচারী ক্রসিং]

☐ Crush/conflict involvement or experience[দুর্ঘটনার বা মোটরসাইকেল দুর্ঘটনা প্রত্যক্ষভাবে লক্ষ্য করার অভিজ্ঞতা]

☐ rainy & stormy weather[বৃষ্টি ও ঝড়ো আবহাওয়ার প্রভাব]

☐ foggy weather & dust filled surroundings[কুয়াশাচ্ছন্ন আবহাওয়া এবং ধুলো ভরা পরিবেশের প্রভাব]

☐ high ambient temperature [উচ্চ তাপমাত্রা]

☐ Lack of lighting [রাস্তা, সংযোগ, মোড়ে আলোর অভাব]

☐ Pavement surface quality loss [রাস্তার পৃষ্ঠের গুণমান হ্রাস]

☐ Problematic, unmanaged, unplanned intersection: [সমস্যাযুক্ত, অব্যবস্থাপিত, অপরিকল্পিত মোড়]

☐ Unprotected, unauthorized Railway crossing [অরক্ষিত রেল লেভেল ক্রসিং, যানবাহনের জন্য রেললাইনের ওপর অমসৃণতা / বিটুমিনাস অথবা কংক্রিট রাস্তার অভাব]

☐ Accident prone turn, bend, curve:[দুর্ঘটনা প্রবণ বাঁক]

☐ Flyover, bridge, culvert (ফ্লাইওভার, ব্রিজ, কাল্ভার্ট

- [ ] Lack of sign, signal, markings, poorly marked curves, unmarked lane changes[সিগনাল, চিহ্নের অভাব, অচিহ্নিত বক্র রাস্তা , অচিহ্নিত লেন পরিবর্তন]
- [ ] Lack of divider, median, guardrails [লেন বিভাজক, গার্ডরেলের অভাব]
- [ ] On street parking, unexpected opening of car doors, bus stops, roadside frictions [রাস্তায় পার্কিং, গাড়ির দরজা অপ্রত্যাশিত খোলা, বাস স্টপ, পথচারীদের চলাচল এবং অ-মোটর চালিত যান]
- [ ] sharing same roadway with other road users of different vehicles[অন্যান্য যান ব্যবহারকারীদের সাথে একই লেন ভাগাভাগি]
- [ ] frequent side road entry [যানবাহনগুলির ঘন ঘন পার্শ্ব রাস্তা থেকে মূল রাস্তায় প্রবেশ]
- [ ] Abrupt lane changing[মোটরবাইকের আকস্মিক লেন পরিবর্তন]
- [ ] Two way traffic movement [দ্বিমুখী যান চলাচল]
- [ ] Lack of law enforcement for drink driving, speed limit, licensing system, training[মদ্যপানে গাড়ি চালানো, গতিসীমা, লাইসেন্সিং ব্যবস্থা, প্রশিক্ষণের জন্য আইন প্রয়োগের অভাব]
- [ ] Cut out movement of motorbikes
- [ ] Competitive riding [প্রতিযোগিতামূলক মনোভাব]
- [ ] Pedestrian crossing[পথচারী ক্রসিং]
- [ ] Pedestrian walking in same direction of motorbike [দুর্ঘটনায় পথচারী ও মটরবাইকের একই দিকে চলাচল]
- [ ] Pedestrian walking in different direction of motorbike[দুর্ঘটনায় পথচারী ও মটরবাইকের বিপরীত দিকে চলাচল]
- [ ] Unsmooth transitions in vertical alignment i.e. entry or exit of flyover or ramp[[ফ্লাইওভার বা র‍্যাম্পে প্রবেশ বা প্রস্থানে অমসৃণ স্থানান্তর]
- [ ] Unfriendly roadside curbs
- [ ] Right Turn, merge movements of vehicles of urban area [শহুরে এলাকায় রাস্তায় ডান বাঁক, পরিবহন একত্রীকরণ ব্যবস্থা]

38. Your further opinion about motorcycle accident in Bangladesh (Optional) [আপনার মতামত——————-(ইচ্ছামূলক)

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