

# The Characteristics of Traffic Accident in Indonesia

Basri<sup>1</sup>, Budiharto<sup>2</sup>, Bambang Tjatur Iswanto<sup>3</sup>  
{basri@ummgl.ac.id<sup>1</sup>}

Faculty of Law, Universitas Muhammadiyah Magelang, 56172, Indonesia<sup>1,2,3,4</sup>

**Abstract.** Motor vehicle accidents occur frequently in Magelang. According to the data from the Magelang Police Traffic Unit, the number of traffic accidents in Magelang Regency during 2017 to 2019 was 2,684 cases. Each year there is an increase in an average of 100 cases. This study tries to look at this fact from the perspective of the time and place of traffic accidents. The purpose of this study is to reveal the relationship between the time and place of the incident and the traffic accident rate. This study uses primary data and secondary data obtained from traffic accident place and the data available at the Magelang Police. This research reveals that during the effective work time, between 06.00-12.00 and 12.00-18.00 WIB or from 06.00-18.00 WIB, the number of motor vehicle accidents is higher in Magelang. According to the location, the number of motor vehicle accidents is higher on busy and straight roads than on winding and deviated roads. From this research it can be concluded that the accident number in Magelang is higher at certain times and places.

**Keywords:** Characteristics, traffic accident, time-place

## 1 Introduction

Traffic accident is one of the most serious social problems in the world. It is the 9th leading cause of death in the world. In the records of the World Health Organization (WHO), in Indonesia, traffic accident is the fifth highest cause of death [3]. According to Dirlantas Polda (Traffic Director of Regional Police) Metro Jaya, Kombes Pol Yusuf, in 2018, the traffic accidents rate in the country increased by 10 percent. This was certainly worrying as it was the year with the highest number of accidents. There were around 25,000-30,000 casualties, which 58 percent of them were millennials, while the rest were upper middle aged [4].

In 2019 the National Police of the Republic of Indonesia recorded that the number of traffic accidents increased compared to 2018. "Throughout 2019 the number of traffic accidents increased by 3 percent, but the number of casualties who died decreased by 6 percent compared to 2018," said National Police Chief General Idham Azis in the year-end release of the National Police, on Saturday (28/12/2019). Based on National Police data, there were 107,500 traffic accidents in 2019, an increase from 103,672 accidents in 2018 [1].

This research was conducted in Magelang Regency. Kabupatèn Magelang is a district in the province of Central Java. The capital of this regency is Kota Mungkid. This district is bordered by Temanggung Regency and Semarang Regency in the North, Semarang Regency, Boyolali Regency and Klaten Regency in the East, Kulon Progo Regency and Sleman Regency (Yogyakarta Special Region), as well as Purworejo Regency in the South, Wonosobo Regency and Temanggung Regency in the West, and around the city of Magelang. This topography

shows that Magelang Regency is a strategic area and is within the circle of several districts in Central Java. This situation has implications for the level of crowd and traffic density in Magelang Regency.

Traffic is the movement of vehicles and people in the road traffic space. Vehicle is a means of transportation on the road consisting of motorized vehicles and non-motorized vehicles [8]. The problems related to traffic are traffic jam and accidents. This factor is influenced by the high volume of vehicles on the road during a certain period of time [9]. This is influenced by several factors such as land use and road width. The high volume of vehicles on the roads in the morning is due to the fact that most vehicles go to urban areas to go to work or school. This is also influenced by the existence of schools, universities, government centers, business centers, and other crowded centers in urban areas. Meanwhile, in the afternoon, the roads that have high volume are roads that leave urban areas. This relates to the end of office and school activities.

Traffic accident is one of the problems in the traffic of motorized vehicle. This research reveals about "The characteristics of traffic accidents in Indonesia, considered from the perspective of the time and place of the accidents". The importance of addressing this problem is due to the high number of accidents that occur in Magelang Regency. This article only reveals traffic accidents from two perspectives, the factors of time and place of the traffic accidents. These two things are brought up so that they could be used as knowledge and reminders for those who drive vehicles to be careful when driving motorized vehicles.

## **2 Method**

This research required primary data and secondary data. The primary data were obtained by observing the traffic flows and accidents in the field. In addition, interviews were also conducted with the police on duty in several accident cases that occurred in Magelang Regency. The secondary data were obtained by visiting the Magelang Regency Police Office. Secondary data needed is an accident report at the Magelang Resort Police Office.

## **3 Results and Discussion**

The traffic accident rate in Magelang is quite high, and it tends to increase each year. A traffic accident is an incident on the road which is unexpected and unintentional, involving a vehicle, with or without other road users, resulting in human casualties and/or property loss. (RI Law number 22, Year 2009, Article 1, paragraph 24). Traffic is the movement of vehicles and people in the road traffic space [2]. An accident is an event that does not happen by chance but is accompanied by a cause that can be found out in order to take preventive action. Accidents can cause mild to severe impacts, both material and non-material [7]. The data on motorcycle traffic accidents in the legal area of the Magelang Police from 2017 - 2019 are revealed as described in Table 1.

It can be seen from the table that the average increase in the number of motorcycle accidents in traffic is more than 100 cases. In 2017 there were 780 motorcycle traffic accidents, and then in 2018 it increased to 901 cases. This means that there was an increase of 121 cases from the previous year. Next, in 2019 there were 1003 traffic accidents that occurred in Magelang Regency. This means an increase of 102 cases compared to the previous year.

**Table 1.** The data on motorcycle traffic accidents

| Number | Year | Number of occurrences | Fatality |                   |                |
|--------|------|-----------------------|----------|-------------------|----------------|
|        |      |                       | dead     | Seriously injured | mildly injured |
| 1      | 2017 | 780                   | 180      | 4                 | 938            |
| 2      | 2018 | 901                   | 170      | 1                 | 1024           |
| 3      | 2019 | 1003                  | 136      | 4                 | 1186           |

Source: Traffic Accident Unit of Magelang Police

The Directorate General of Land Transportation of Indonesia [2] stated that the number of traffic accidents in Indonesia was increasing every year. The high number of traffic accidents in Indonesia is in line with the increasing number of motorized vehicles. The increase in the number of motorcycles is the highest among other types of motorized vehicles [3]. According to Risesdas (Basic Health Research) 2013, there is a trend of injury prevalence increase from 7.5 percent to 8.2 percent. The second cause of most injuries is motorcycle accident (40.6 %) [3].

An accident is a very complex event. In general, traffic accidents that occur are caused by several factors, such as human negligence, geometrical conditions of the road, vehicle feasibility, and environmental conditions. Based on the data from Korlantas Polri (Traffic Corps of Indonesian Police) 2011-2013, the factors that cause traffic accidents are disobedient, which is as many as 27,035 cases; carelessness, with 21,073 cases; and exceeding the speed limit, with 9,278 cases.

### 3.1 Characteristics of Traffic Accidents Based on The Time of the Incident

Based on Table 2, it can be concluded that many accidents occurred around 06.00-12.00 and 12.00-18.00, or 06.00-18.00.

**Table 2.** Traffic Accidents Based on the Time of Incident 2017-2019

| Start from   | until | Number of casualties |      |      | Total | %     |
|--------------|-------|----------------------|------|------|-------|-------|
|              |       | 2017                 | 2018 | 2019 |       |       |
| 0:00         | 6:00  | 193                  | 166  | 263  | 622   | 10,48 |
| 6:00         | 12:00 | 528                  | 671  | 756  | 1955  | 32,93 |
| 12:00        | 18:00 | 573                  | 604  | 771  | 1948  | 32,81 |
| 18:00        | 0:00  | 393                  | 449  | 570  | 1412  | 23,78 |
| <b>Total</b> |       | 1687                 | 1890 | 2360 | 5937  | 100   |

Many cases of accidents occur at this time because at these times road traffic is usually filled with vehicles going to work and coming home from work. Meanwhile, many motorcycle riders are not careful, in a hurry, in a state of fatigue, and they want to get to their destination quickly, so they drive their vehicle at high speed. This fact is in accordance with what is stated by Manggala [6] that the speed factor is one of the factors causing accidents.

### 3.2 Characteristics of Traffic Accident Based on The Place of Accident

The place with the highest number of accidents in Magelang Regency during 2017-2019 is Mertoyudan District. This is because Mertoyudan District has an area through which the National Road 14 (Jl. Magelang-Jogjakarta) passes. So that the traffic is very busy and never

empty from motorized vehicle. In addition, Mertoyudan District has various economic and shopping business centers. The following is a table regarding the places where motor vehicle accidents occurred and the casualties showed on Table 3.

**Table 3.** Motor vehicle accidents based on place

| No | Area        | Number of casualties according to year |                |                | Total |
|----|-------------|--|----------------|----------------|-------|
|    |             | 2017                                   | 2018           | 2019           |       |
| 1  | Bandongan   | -                                      | -              | 4 casualties   | 4     |
| 2  | Borobudur   | 62 casualties                          | 80 casualties  | 135 casualties | 277   |
| 3  | Candimulyo  | 16 casualties                          | 38 casualties  | 65 casualties  | 119   |
| 4  | Dukun       | 34 casualties                          | 42 casualties  | 59 casualties  | 135   |
| 5  | Grabag      | 82 casualties                          | 79 casualties  | 85 casualties  | 246   |
| 6  | Kajoran     | 48 casualties                          | 23 casualties  | 26 casualties  | 97    |
| 7  | Kaliangkrik | 20 casualties                          | 17 casualties  | 57 casualties  | 94    |
| 8  | Mertoyudan  | 233 casualties                         | 331 casualties | 320 casualties | 884   |
| 9  | Mungkid     | 174 casualties                         | 214 casualties | 228 casualties | 616   |
| 10 | Muntilan    | 154 casualties                         | 195 casualties | 259 casualties | 608   |
| 11 | Ngablak     | 11 casualties                          | 11 casualties  | 49 casualties  | 71    |
| 12 | Ngluwar     | 20 casualties                          | 25 casualties  | 50 casualties  | 95    |
| 13 | Pakis       | 81 casualties                          | 57 casualties  | 69 casualties  | 207   |
| 14 | Salam       | 145 casualties                         | 124 casualties | 158 casualties | 427   |
| 15 | Salaman     | 132 casualties                         | 173 casualties | 232 casualties | 537   |
| 16 | Sawangan    | 30 casualties                          | 31 casualties  | 41 casualties  | 102   |
| 17 | Secang      | 204 casualties                         | 244 casualties | 243 casualties | 691   |
| 18 | Srumbung    | 24 casualties                          | 28 casualties  | 19 casualties  | 71    |
| 19 | Tegalrejo   | 115 casualties                         | 59 casualties  | 115 casualties | 289   |
| 20 | Tempuran    | 88 casualties                          | 94 casualties  | 125 casualties | 307   |
| 21 | Windusari   | 14 casualties                          | 18 casualties  | 19 casualties  | 51    |

It can be seen from the table that the five places with highest number of motorized vehicle accidents are: Mertoyudan District with 884 casualties (233 (2017), 331 (2018), 320 (2019)); Secang District with 691 casualties (204 (2017), 244 (2018), 243 (2019)); Mungkid District with 616 casualties (174 (2017), 214 (2018), 228 (2019)); Muntilan District with 608 casualties (154 (2017), 195 (2018), 259 (2019)); and Salaman District with 537 casualties (132 (2017), 173 (2018), 232 (2019)).

Why there are so many traffic accident casualties or traffic accidents in these places is because these places -Mertoyudan, Secang, Muntilan and Salaman- are areas where the roads are very busy with various vehicles. The road is straight. In addition, these places are the main roads that are passed for destinations to other regencies or provinces, such as to Yogyakarta or Semarang or Purworejo. Because these roads are main roads, riders generally ride their motorcycles at high speeds. It is different with Kota Mungkid. Although it is not the main route to go to other areas, Kota Mungkid is the capital of the Regency. As the capital, the road is also

good, straight, but rather quiet, not as busy as the main road. This situation also triggers riders or drivers to run their vehicles at high speed.

#### 4 Conclusion

It can be seen that at certain times, ie: during peak hours, the accident rate is higher than at other times as at these peak or busy hours all people who drive motorized vehicles want to get to their destination immediately. Therefore, they drive at high speed. However, this kind of action is very detrimental because it could be the cause of traffic accidents. On the other hand, certain places, ie: busy, straight, good, and quiet roads can also be the cause of traffic accidents as these places can trigger drivers to accelerate their vehicle speeds even higher.

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