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Does Riding Behavior Depend on Where You Live? Differences between Regions in Peninsular Malaysia among the Working Population

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Abstract – *The rising trend of fatal motorcycle accidents in Malaysia is continuously growing since the early 90s. This mode of transportation become popular, particularly in developing and middle-income countries – due to the lower cost of ownership as compared to passenger cars. Through this study, the riding behavior of workers during commuting between different regions in Peninsular Malaysia was compared. Overall, personal safety equipment recorded the highest percentage of non-compliance among the listed behavior in each region. Based on the presented findings, localized riding behavior in the Peninsular Malaysia regional area was determined, i.e., similarity of riding behavior patterns found in central, northern, and southern regions of Peninsular Malaysia. This study is essential as a guide for a strategic regional commuting management plan, especially for those who travel to, from, and for work using a motorcycle.*

Keywords: Commuting safety, commuting management, riding behavior, working population

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1.0 INTRODUCTION

Commuting accident is defined as an accident happening while traveling on a route between a place of residence to a place of work, traveling on a journey made for any reason which is directly connected to employment, or traveling on a journey during any authorized recess (Section 24, Employees Social Security Act 1969). The broad implication of commuting accidents reflects the current need for a proactive mitigation action plan. Accordingly, comprehensive safe commuting management focusing on employee education and advocacy program is urged (Yaacob et al., 2018). Apart from regular-basis training and continuous commitment from both employers and employees, Sulong et al. (2019) have proposed a commuting safety and health practice guideline. The implementation of the proactive initiative certainly requires a further thorough analysis of the reported commuting accidents to address

this problem systematically and efficiently. As highlighted by Dietz et al. (2020), identification of the potential risk groups is essential in determining a successful intervention.

In Malaysia, work-related accidents reported by the Social Security Organisation (SOCSO, 2015) shows that commuting accident increased by 15.2% in five years period, from 24,809 in 2011 to 28,579 in 2015. Out of the total cases in 2015, commuting accidents contributed about 45%. Besides the significant percentage, the increasing trend of commuting accidents nationwide since 2011 is alarming. Earlier, further analysis of the SOCSO Database for 2009 and 2010 revealed that almost 85% of the commuting accidents occurred among those traveling by motorcycle (Azhar, 2014). This mode of transportation become popular, particularly in developing and middle countries by virtue of the low cost of ownership in the motorized vehicle segment. Due to its increasing usage, the number of motorcycle crashes and related fatal injuries in these countries is also increasing (Sukor & Fujii, 2011). The rising trend of fatal motorcycle accidents in Malaysia is continuously growing since the early 90s.

According to the Monash University Accident Research Centre (Fildes et al., 2013), human factors contributed to 95% of the overall crash involvement factors. This main contributing factor was recognized based on a telephone survey among 1,922 participants. The factor consists of issues related to driver behavior and attitudes including helmet wearing, overtaking on the left, riding in the emergency lane, running red lights, riding in between moving cars, and trucks tailgating, speeding, smoking, and using a mobile phone while riding. Careless driving was the largest proportion of drivers' faults that affected the high fatality rate among motorcyclists. A study conducted in Terengganu, a state in the Eastern region of Malaysia, reported that turn signal neglect is the most dominant risky driving behavior among the 72,377 observed motorcyclists (Rusli et al., 2020). Meanwhile, in another study conducted, it was noticeable that violation of traffic lights by motorcycle riders had increased about threefold (Laksanakit, 2013). Different accident patterns in areas with varying levels of urbanization (Cabrera-Arnau et al., 2020) may contribute to this prevalent difference. Therefore, this prevalence study aims to compare the difference in riding behavior of workers in different regions in Malaysia during commuting.

2.0 METHODOLOGY

2.1 Sample Size and Sample Selection

Samples in this study comprise 1,819 randomly selected workers from 70 small to medium enterprise (SME) companies in Malaysia that participate in the intervention program, Commuting Safety Support Program (CSSP), and fulfill these inclusion criteria:

i. Malaysian citizen;
ii. Commute using a motorcycle;
iii. Permanent or contract workers; and
iv. Able to communicate, read and write either in Malay *(Bahasa Melayu)* or English

Figure 1 defines the division of four regional areas in Peninsular Malaysia. Based on the blue dotted construction line, the northern, central, southern, and eastern region was defined. Each region comprises several states as isolated by the solid red line.

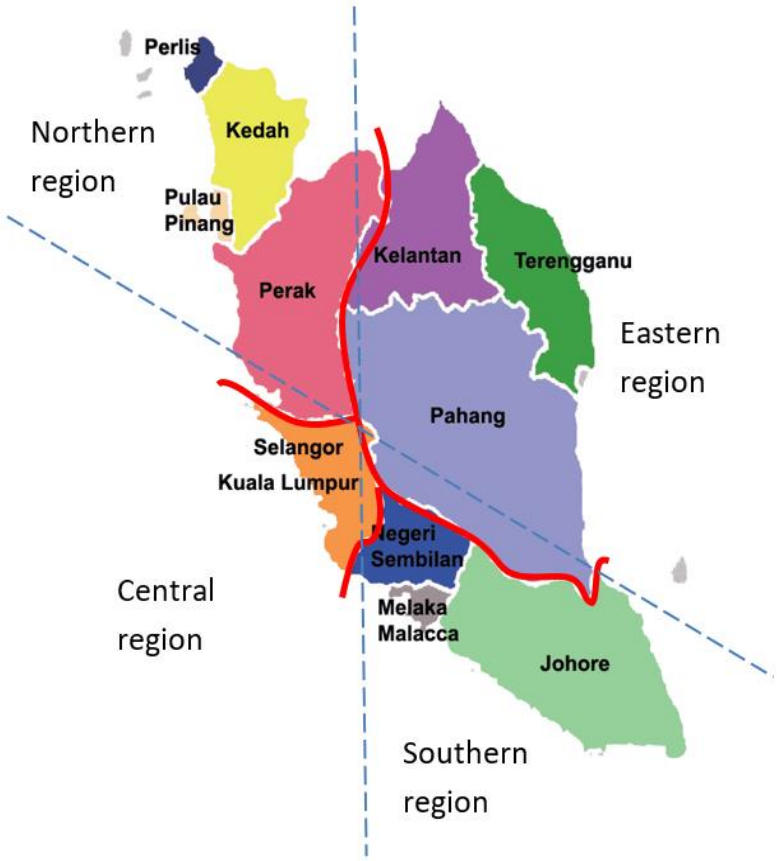

Figure 1: Regions in Peninsular Malaysia (used in the study/project)

2.2 Questionnaire

The Motorcycle Riding Behavior Questionnaire (MRBQ) was used to measure the riding behavior of the workers' pre- and post-intervention. However, for this study, we use only pre-intervention data. This study utilizes the simplified Malaysian Version of MRBQ, which was also used in the previous survey conducted by Azman et al. (2017). This self-administered questionnaire is an adapted version of the original MRBQ (Elliott et al., 2007) and a Persian version of the MRBQ (Motevalian et al., 2011), which was then back-translated and tested for its psychometric properties. The Malaysian version of the MRBQ consists of five components of riding behavior which are Safety Violations (Cronbach's Alpha = 0.902), Traffic Errors (Cronbach's Alpha = 0.903), Speeding (Cronbach's Alpha = 0.80), Safety Equipment (Cronbach's Alpha = 0.84) and Precaution (Cronbach's Alpha = 0.42). The overall reliability of the Malaysian MRBQ is 0.70. The simplified Malaysian version of MRBQ consists of four constructs, namely safety violations, traffic errors, speeding, and safety equipment. Table 1 lists the description of each construct that reflects the typical risky riding behavior among motorcyclists. A comparison between the prevalence of these constructs in different regions in Peninsular Malaysia was carried out to exhibit a localized motorcyclist riding behavior.

Table 1: Description of constructs that reflects the typical risky riding behavior among motorcyclists

Risky Riding Behavior	Descriptions
Traffic violation	Violations of traffic rules such as the unlicensed, improper wearing of a helmet, and riding in the opposite lane
Traffic error	mistakes or wrong decisions made during motorcycle riding
Speeding	Behaviors of riding over the speed limit
Safety equipment	The use of safety equipment to increase safety while riding; non-wearing of personal protective equipment (PPE), including helmet, safety vest, etc.

3.0 RESULTS AND DISCUSSION

The finding of this study is discussed in the following three subsections, i.e., overall riding behavior prevalence, cases recorded by riding behavior, and cases recorded by region.

3.1 Overall Prevalence of Riding Behavior

Figure 2 shows the overall percentage of motorcyclist risky riding behavior in Peninsular Malaysia. Safety equipment recorded the highest percentage of non-compliance among the listed behavior. The most frequently reported construct among the working population is followed by traffic error, speeding, and safety violations. This pattern happen might be due to workers commuting a short distance in the rural area. Based on this pattern, enforcement activity focusing on motorcycle safety equipment especially helmet-wearing enforcement in the rural area is proposed.

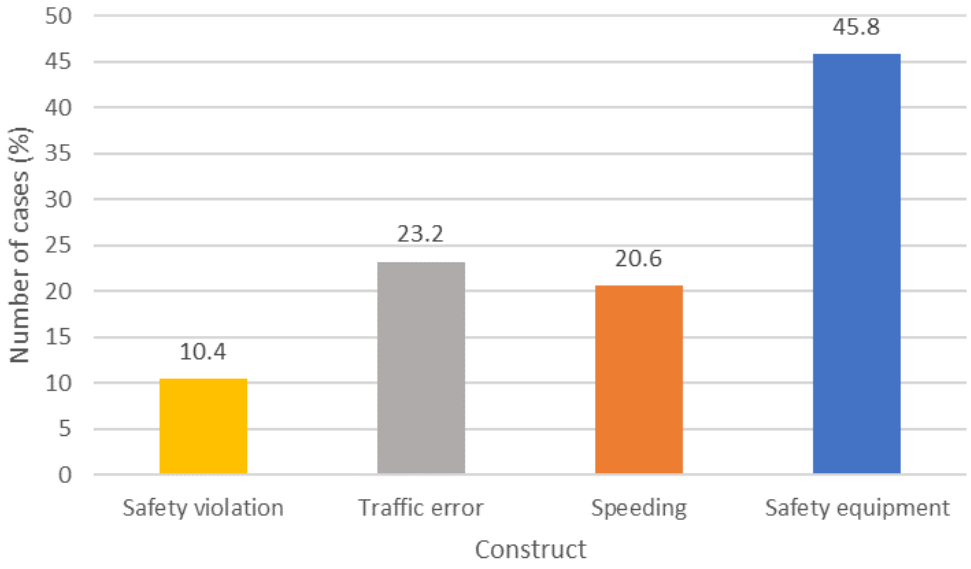

Figure 2: Overall percentage of motorcyclist risky riding behavior in Peninsular Malaysia

3.2 Recorded Cases by Riding Behavior

Figure 3 shows the number of recorded cases according to the risky riding behavior defined in Table 1. In terms of safety violations, in general, all regions recorded almost a similar percentage between 20 and 30%. However, the central region is slightly higher than the rest with 29.3%. The high number of motorcycles in the central region according to the total number of registered motorcycles/vehicles in Selangor and Kuala Lumpur could be the reason. The very high population in this regional area may contribute to the motorcycle preference for daily commuting activities to avoid the high traffic volume. Also, the high living cost in this urban region could be another factor in commuting preference for motorcycles.

As for the traffic error and speeding riding behavior, the central and northern regions recorded an almost similar pattern. Both regions have a percentage of the specified risky riding behavior exceeding the mean value of 25. Despite this similarity, more motorcyclists in the northern region are involved in traffic error (34.6% of the total traffic error cases) whereas the central motorcyclist community has a higher tendency of speeding (32.6% of the total speeding cases). This finding exhibit that the availability of a good road network in this region is abused.

In contradiction, observation of the usage of safety equipment revealed a different pattern. This risky driving behavior was dominantly contributed by the eastern region motorcyclists by almost 40% of the total number of safety equipment non-compliance cases. The localized dominant motorcyclist riding behavior according to the regional area is listed as follows:

i. Traffic error should be emphasized for the northern region;
ii. Motorcycle speeding should be emphasized in the central region;
iii. Compliance with safety equipment should be emphasized for the eastern region; and
iv. Safety violation is approximately similar for all regions.

It is to be noted that this listing means that a strategic action plan on the specific riding behavior is proposed to be emphasized in the stated region. An exact proportion of riding behavior by region is discussed in the next section.

3.3 Recorded Cases by Region

Further analysis was conducted to observe the risky riding behavior by region. Figure 4 shows the prevalence of risky riding behavior recorded by region. Overall, the non-compliance of safety equipment is significant for all regions, in which all areas are exceeding the mean. Even though analysis in the previous section explains that any intervention concerning this issue should be prioritized in the eastern region, this result found that it is still the most prominent in other areas. An almost similar percentage of the safety equipment non-compliance was shown in three regions, which are central (38%), northern (38.7%), and southern (38.7%). The deviation of percentage between these regions is ≤1%.

A comparison of the riding behavior pattern between regions revealed an exciting finding. In ascending order, the least riding behavior issue is the safety violation, followed by speeding, traffic error, and the most prominent is safety equipment usage. This pattern is recognized in all regions except the eastern. However, there is only a slight difference (≤1%)

between the traffic error and speeding issues in both central and southern regions. It is interesting to note that these two regions exhibit an almost comparable riding behavior pattern.

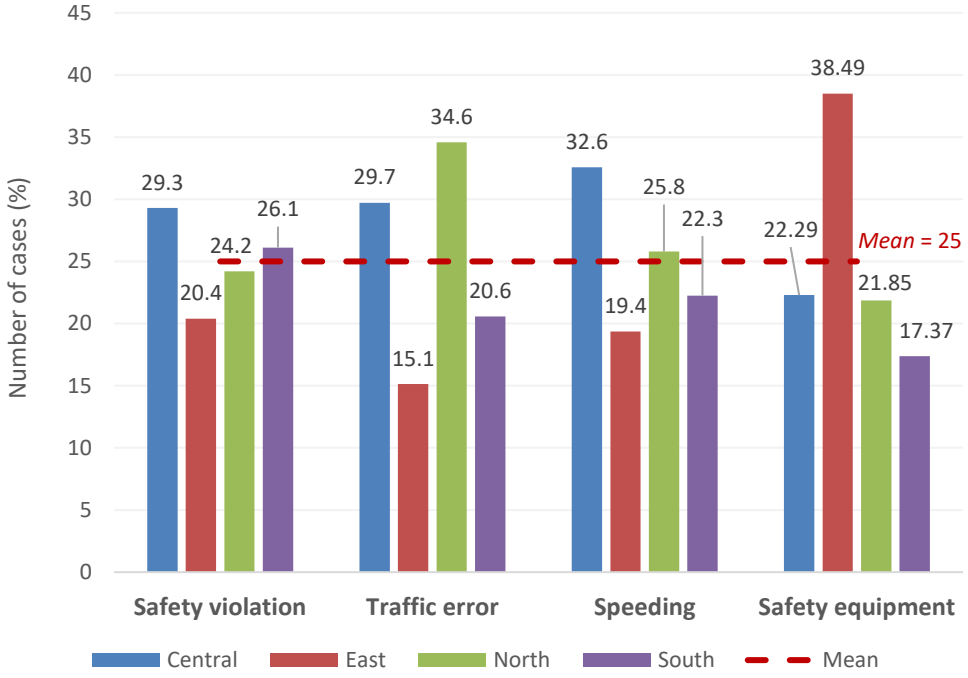

Figure 3: Number of recorded cases according to the defined risky riding behaviors

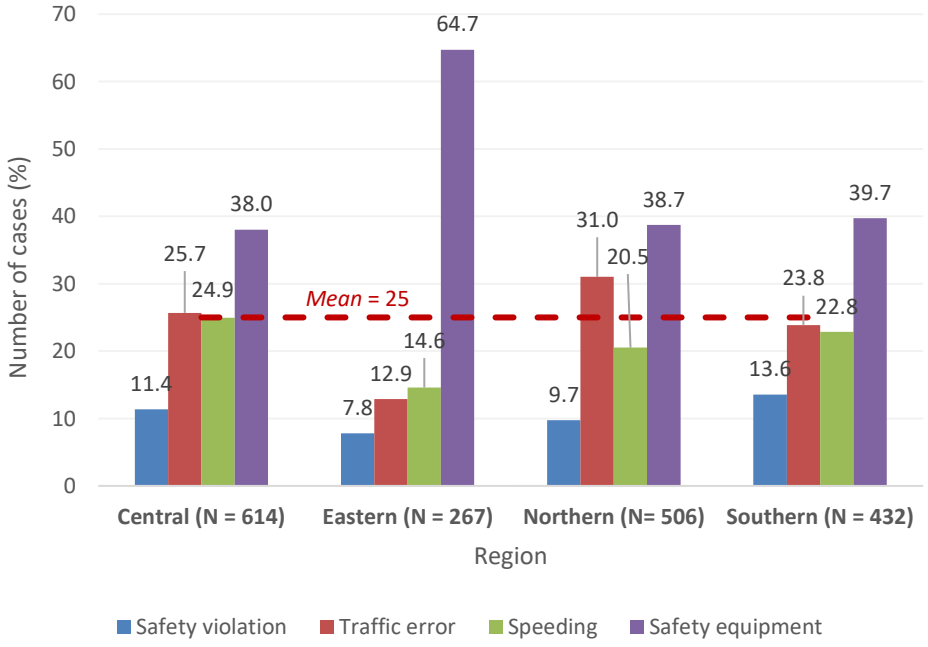

Figure 4: Prevalence of risky riding behaviors

4.0 CONCLUSION

In this study, the riding behavior of workers in different regions in Peninsular Malaysia during commuting was compared by evaluating the prevalence of risky riding behavior among motorcyclists in Peninsular Malaysia during commuting, identifying the most dominant region for a particular risky riding behavior and comparing the similarity of riding behavior pattern of workers between regions in Peninsular Malaysia during commuting. Accordingly, it can be concluded that:

i. Overall, safety equipment recorded the highest percentage of non-compliance among the listed behavior in each region; and
ii. Similarity of riding behavior pattern of workers in Central, Northern and Southern region.

Based on the presented findings, localized riding behavior in the Peninsular Malaysia regional area was determined. Therefore, an appropriate enforcement and advocacy approach for a particular region can be effectively constructed. This study is essential as a guide for a strategic regional commuting management plan, especially for motorcyclists.

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REFERENCES

Azhar, A. (2014). Commuting accidents: What does research show? Commuting Accidents Prevention Seminar, Monash University Malaysia, December 2014.

Azman, N. S., Mohamad, N. A., Ab-Rashid, A. A., Yei, L. S., Fin, L. S., & Voon, W. S. (2017). Safety violations, traffic errors and speeding as contributing factors in road crashes among young motorcyclists in Klang Valley (No. 216). MIROS Research Report.

Cabrera-Arnau, C., Prieto Curiel, R., & Bishop, S. R. (2020). Uncovering the behaviour of road accidents in urban areas. Royal Society Open Science, 7(4), 191739.

Dietz, P., Reichel, J. L., Werner, A. M., & Letzel, S. (2020). Study-related work and commuting accidents among students at the University of Mainz from 12/2012 to 12/2018: Identification of potential risk groups and implications for prevention. International Journal of Environmental Research and Public Health, 17(10), 3676.

Elliott, M. A., Baughan, C. J., & Sexton, B. F. (2007). Errors and violations in relation to motorcyclists' crash risk. Accident Analysis & Prevention, 39(3), 491-499.

Fildes, B., Morris, A., & Barnes, J. (2012). Analysis of injuries to young and old Victorian public transport users: 2006-2010. Monash University Accident Research Centre Report, 319.

Laksanakit, C. (2013). Impact of motorcycle defects on motorcycle safety in Thailand. Journal of Society for Transportation and Traffic Studies (JSTS), 5(1), 1-15.

Motevalian, S. A., Asadi-Lari, M., Rahimi, H., & Eftekhar, M. (2011). Validation of a Persian version of motorcycle rider behavior questionnaire. In Annals of Advances in Automotive Medicine/Annual Scientific Conference (Vol. 55, p. 91). Association for the Advancement of Automotive Medicine.

Rusli, R., Oviedo-Trespalacios, O., & Abd Salam, S. A. (2020). Risky riding behaviours among motorcyclists in Malaysia: A roadside survey. Transportation Research Part F: Traffic Psychology and Behaviour, 74, 446-457.

SOCSO (2015). Laporan Tahunan Pertubuhan Keselamatan Sosial 2015. Social Security Organisation, Malaysia.

Sukor, N. S. A., & Fujii, S. (2011). Factors affecting motorcyclists speeding behavior in different types of motorcycle lanes. A study from psychological perspectives. In Proceedings of the Eastern Asia Society for Transportation Studies Vol. 8 (pp. 390-390).

Sulong, A. W., Hassan, A., Mohamed, T. & Raja, A. (2019). Guidelines on safe work practice when commuting in oil palm plantations (2), 222–228.

Yaacob, S. S., Ismail, K. I., Shaarial, S. Z. M., Noor, N. M., Selvaraju, R. & Ghani, H. A. (2018). Commuting accidents among health care workers working in Malaysia government hospitals. International Conference of Occupational Health and Safety (ICOHS-2017), pp.79–87.