A Study on Curbside Overtaking in Sri Lankan Streets

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ABSTRACT

Overtaking slower moving vehicles on the curbside under mix traffic condition is very common in Sri Lanka. The overtaking should never be done from the curbside as a rule of thumb, also rules and regulations regarding the overtaking should be never broken by drivers. Traffic accidents statistics reveal that main cause for serious accidents in Sri Lanka are excessive speed and incorrect overtaking. However, to the best of authors' knowledge any research about curbside overtaking behavior has not been done so far. Objectives of this study are to investigate self-reported drivers' overtaking behavior, and to find out drivers' perspective about current rules and regulations on overtaking. A questionnaire form was developed, and a survey was conducted to collect data among 430 people in Colombo district. Chi–square tests and multinomial logistic regression analysis were done. Chi – square test results showed that among the selected variables, gender, age, occupation, driving license availability, charged a fine or accident due to curbside overtaking are the main factors that affect the curbside overtaking. The results of this study are facilitative to understand characteristics and some reasons behind curbside overtaking. Some methods such as educate public about dangerous overtaking and rules by organizing awareness programs, increasing fine for curbside overtaking, and imposing new laws are suggested to minimize the number of road accidents caused by overtaking slow moving vehicles on the curbside of the road.

KEYWORDS: *overtaking, drivers' misbehavior, traffic accidents, road safety, questionnaire survey.*

1 INTRODUCTION

Road accidents are defined as an unplanned injury, death, or property damage that occurs as a result of a series of circumstances. Accidents are becoming one of the most common causes of death (WHO, 2021). Road Traffic Accidents (RTA) are killing people at an alarming pace all over the world. Road traffic accidents take the most lives from all traffic accidents and it has become the most significant problem in the world. The number of persons killed in RTA each year is believed to be at 1.2 million, with an additional 50 million persons wounded. (Pathak et al., 2018).

Sri Lanka has a rate of annual road collision fatalities per capita (17.4) that is twice that of high-income nations and five times that of the world's top performing countries (Bandyopadhyay, 2020; Amarasingha, 2021). The stated death rate 17.4 is the highest in the South Asian area among Sri Lankas' nearest neighbors. According to the National Council for Road Safety (NCRS), over 38,000 incidents occur each year, resulting in over 3,000 fatalities and 8,000 serious injuries; the majority of these collisions occur between April and December, during the holiday season. Traffic accidents statistics Sri Lanka reveal that the most of accidents happening are due to overtaking and excessive speed, which leads to fatal injuries and severe damages to vehicle, properties as well as the passengers. Overtaking is one of the most difficult and significant maneuvers on undivided roads, where vehicles use the opposing lane to pass slower vehicles as oncoming vehicles approach from the opposite direction. Drivers must maintain road disciplines otherwise they risk endangering not only their self, passengers in vehicle, also other road users. Therefore, main aim of our study is to investigate the overtaking behavior of slow-moving vehicles from curbside. There are many studies focused on traffic accidents and overtaking but any study about overtaking from curbside could not be found in the literature.

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2 LITERATURE SURVEY

Iversen and Rundmo (2004) identified reasons of risk behaviors and involvement of accidents in traffic. The attitude of the drivers' risky behavior, reasons to break the rules and causes for the severe damages were investigated. This study was based on a questionnaire survey carried out among Norwegian drivers. The findings revealed that attitudes toward traffic safety issues, especially attitudes toward speeding, influenced participation in risky traffic behavior. Risky behavior had an effect on the number of near- misses and injuries, age and gender were found to influence attitudes and risk behavior. Wang et al. (2020) have conducted research about e – bike riders in China. A questionnaire survey was conducted to find out risky riding behaviors of electric bike riders in Nanning and Guiling cities. Tracking Survey and Random survey methods were used and collected total 573 valid samples. Results of this study showed the relationships between risky riding behavior, riding confidence with safety attitudes and risk perception.

Rezagholipour et al. (2016) conducted a research study on decreasing overtaking series accidents on two - lane curved roads in Iran. As the method of data collection two distinct driver behavior patterns were examined. Vehicle behavior in zigzag overtaking was the first model. The results show accurate accident modeling in provisioning and a reduction in accident rates also some ideas were provided to reduce overtaking accidents on two-lane curved roads. Richter et al (2017) revealed about reasons, results, and countermeasures of overtaking accidents on two-lane rural roads in Germany. The goal of this study was to identify the infrastructure and traffic- related factors that influence the occurrence and consequences of overtaking incidents, as well as drivers' overtaking behavior. As a result, they discovered that severe overtaking accidents can be avoided in Germany by incorporating road design groups and related overtaking rules into the supervision for the design of rural roads.

Asaithambi and Shravani (2017) has done a research study about lane Overtaking behavior of vehicles on undivided roads in non-lane based mixed traffic conditions in India. Overtaking data was obtained using a car and the registration plate method on a 1.2 km two-lane two-way an undivided road located in Mangalore city of India. According to the findings of the study, the average overtaking time for flying overtaking was 7.4 seconds and 9.2 seconds for accelerative overtaking. The mean overtaking time for heavy goods vehicles was bigger (10.3seconds) than for other vehicle classes. The mean overtaking time (7.5 seconds) was shorter for cars and two-wheelers, which may be attributed to their greater maneuverability. Heavy vehicles had a longer mean overtaking distance (145.0 meter), while two wheelers had a shorter distance (101.6 meter).

Mocsári (2009) conducted a study in Hungary about possible solutions to make overtaking maneuvers safer by using intelligent systems in the vehicle. Data was collected using video recordings and the instruments were installed in the car. As the conclusion they have mentioned that vehicle drivers should be made aware that speeding in the course of overtaking was also considered speeding, the primary features of accelerated, continuous, and numerous overtaking should be explained to drivers during their training. In another study by Kashani et al (2016) in Iran, identified significant variables influencing overtaking maneuvers on two-lane, two-way rural roads. The data was gathered, and the study was conducted using a field data gathering approach. On the remote roads of Zanjan and East Azerbaijan regions, an expert of transportation engineer was accompanied and recorded correspondent information of drivers performing overtaking maneuver. Pearson's chi-square test was used to select variables, which were then entered into a multivariate logistic regression mode. The model's findings revealed that for drivers aged 40 to 49, the likelihood of conducting a "lane sharing" move was around four times larger than that of doing a "cutting in" overtaking movement. The likelihood of executing a "cutting in" overtaking maneuver was lower among drivers who knew where police locate.

Llorca et al (2013) studied about the effect of age and gender on overtaking maneuver on two-lane, two-way roads in Spain. A passenger car was used settled with four cameras, laser rangefinders and a GPS tracker to collect data. This vehicle was driven at a significantly slower speed than the normal operating speed of different 4 road segments in Valencia (Spain) and observed 214 overtaking maneuvers. Multi factor ANOVA and multiple linear regression model were used for the analysis. Data analysis showed that there was a difference in behavior across age and gender categories, with young male overtaking drivers being more aggressive. Overtaking timings were roughly 1 second faster than other drivers, also showed 4 km/hr. higher difference in average speed.

Mehta et al. (2015) considered about evaluation of the passing behavior of motorized vehicles when overtaking bicycles on urban arterial roadways in India. A sensor array consisting of an ultrasonic sensor, a GPS receiver, and a video camera were mounted to a bicycle to collect data. On various sorts of urban arterials, a total of 5,227 passing incidents were observed in one month. It was revealed that when there is no bike lane, the proportion of passing autos moved laterally to the left and encroached into the next lane is higher. Drivers on arterial routes without on-street bike lanes tended to provide greater lateral clearance by changing lanes or infringing on the next lane.

According to the literature review, several studies on the overtaking maneuver have been conducted all over the world. Some experiments were preceded by questionnaire surveys, while others were carried out using on-the-spot video recordings. In most of the investigations, the data were analyzed using the chi square test and the multi nominal logistic regression test. There were several studies on right-side overtaking, but no studies were found on curbside overtaking.

3 METHODOLOGY

3.1 Study Area

Research study was conducted in the Colombo district of Sri Lanka as it is most populated district in Sri Lanka. According to the department of Census and Statistics, the current metro area population of Colombo in 2021 is 619,000**,** a 0.98% increase from 2020 (Department of census and statistics, 2021). Sri Lanka's motor vehicle population was increased by 7 to 7.2million in 2017 and most of the vehicles are registered in Colombo district as mentioned in the country's motor vehicle market published by the Ceylon Chamber of Commerce.

3.2 Development of Questionnaire and Data Collection

To achieve the study's goals, data were collected using a questionnaire survey to learn about drivers' ideas about overtaking behavior, current overtaking rules use in Sri Lanka and how it has affected in road accidents. By conducting the pilot study and examining prior research, the dangerous features and habitual behavior were discovered. A total of 430 survey forms was printed and distributed. This questionnaire consists of three parts; in the first part of the questionnaire include questions related to users' socio-economic characteristics like age, gender, profession, living district and etc. In the second part, respondents were asked some questions about driving and experience they had about overtaking and related rules like driving license class, vehicle type they use, accidents happened due to overtaking, awareness about current rules and regulations about overtaking. In the final part they had to give some ideas about how we can improve this drivers' misbehavior in the road.

Targeted respondents for the questionnaire survey are in the range of age from 18 to 60 which can be filled by anyone even who does not have license. "Have you overtaken from left side" is the dependent variable and there are several independent variables which was made to do the analysis easily. The sample size calculation was done according to the Equation 1 (Barlett et al,2001).

$$N = \frac{z^2 P(1-p)}{d^2} \quad (1)$$

Where, N = sample size, z^2 = Value corresponding to confidence level, d = Margin of error, P = expected population proportion. The minimum sample was obtained by assuming a 95% confidence level (Z = 1.96) and a 5% margin of error (d =0.05). To obtain the minimum sample size expected population proportion of 50% was assumed. This resulted in a minimum sample size of 385.

3.3 Cronbach's Alpha Reliability Test

A 5-unit Likert scale from 1 to 5 was utilized to obtain this information from the respondents, where 1 = never, 2 = rarely, 3 = occasionally, 4 = sometimes, and 5 = always. This eliminates problematic survey questions such as open-ended and fill-in-the-blank questions. Cronbach's Alpha reliability test was used to determine the internal consistency between items on a scale in order to investigate the correlation between each item on the Likert scale. A number between 0 and 1 is used to represent this. The

acceptable range for alpha is 0.70 to 0.95, with values less than 0.70 being regarded suspect (Garth, 2008).

3.4 Data Analysis

Aim of this study is to understand the reasons behind drivers' misbehavior on the road and to figure out ways to avoid or reduce curbside overtaking. The most common tool for studying a similar aim is a questionnaire. Mainly there is two categories, dependent and independent variables. Dependent variable is, "have you overtaken from left side". Categories of the vehicle type, age of the drivers, whether they have license or not, driving license classes they have, in which district they mostly drive or travel within and the occupation will be independent variables of the study. Data was entered and analyzed using SPSS statistical software.

3.4.1 Chi- square Statistics

When employing a crosstabulation, also known as a bivariate table, the Chi-Square statistic is the most typically employed to analyze tests of independence. Crosstabulation shows how is the distributions of two categorical variables at the same time, with the intersections of the variables' categories showing in the table's cells. One variable's classification appears in rows when the other variable's classification appears in columns. Each variable must have two or more categories and each cell reflect the total count of cases for a specific pair of categories. The researcher can examine if the observed cell counts are significantly different from the predicted cell counts by computing the Chi-Square statistic and comparing it to a critical value from the Chi-Square distribution. A chi-square test with a p-value less than or equal to the significance threshold indicates that there is sufficient evidence to substantiate that the observed distribution differs from the predicted distribution. A p-value greater than 0.05 indicates that the null hypothesis is strongly supported. It demonstrates that the null hypothesis should be retained, and the alternative hypothesis rejected. Equation 2 was used to determine the Chi-square statistics (Cheng Hua, 2021);

$$X^2 = \Sigma\frac{(Oi-Ei)2}{Ei} \quad (2)$$

where Oi is the observed number of counts and Ei is the expected number of counts.

3.4.2 Multinomial Logistic Regression

Multinomial Logistic Regression analysis is a predictive analysis and is used for explaining the relationship between a nominal or ordinal dependent variable and one or more independent variables. When the dependent variable is qualitative and if it has more than two possible answers or categories, then multinomial logistic regression could be used to estimate the probability of occurrences for each of the alternatives. A likelihood ratio test, chi-square test and a comparison of the complete model to a null model are included in the model fitting information of multinomial logistic regression. The full model will have all of the predictors, whereas the null model will not. The 5% significance level (p- value) is used to determine if an overall model is fit or not. The null hypothesis (intercept only model) is rejected if the significance value is less than 0.05. This indicates that the final model is more important than the null model, and that the final model considered as fit. Equations 3 and 4 are used to determine the results (Long, 1997).

$$\log(\text{odds})=\text{logit}(P)=\ln(P1-P) = a+b1x1+b2x2+b3x3+\ldots \quad (3)$$

$$p = \left(\frac{\exp(a+b1X1+b2X2+b3X3+\cdots)}{1+\exp(a+b1X1+b2X2+b3X3+\cdots)}\right) \quad (4)$$

where: xi: the influencing independent variables for dependent variable "have you overtaken from the curbside", and bi: regression coefficients.

4 RESULT AND DISSCUSSION

A total of 430 survey forms were printed and distributed. Out of them, 291 (67%) were answered by male respondents and 139 (33%) were answered by female respondents. Despite the fact that there is some gender equality in the population of Sri Lanka, the number of females who hesitate to drive on the road is lower than expected. The majority of the people who answered the questionnaire was of the age group 19 to 28 which consisted of 42.32% of the total sample size. About 7% respondents were age below 18 years and the rest of 68% were age above 29 years. Also, most of the respondents are working in private sector, that is 37% and second highest value for the occupation was driving that is 22.5%. When distributing the questionnaires, special attention was paid to respondents who stated that driving is their primary source of income, as this allows for the collection of more precise information. Participants 302 (70%) had full license, 96 (23%) had just the learner's permit while 31 (7%) participants had not taken driving license, Nonetheless, from their experience, we were able to gather some information about curbside overtaking. From the total respondents 31% have met accident and 20% have stopped or charged a fine due to curbside overtaking respectively. Also, majority thinks that light motorcycles and three wheelers are the mostly overtaking vehicle types on the road.

4.1 Cronbach's alpha Reliability Test Results

All of the Likert scaled items were framed in negative order to apply Cronbach's Alpha reliability test to a set of items. The average correlation among the 10 items questioned is shown in the Table 1. Because the number is greater than 0.70, Cronbach's alpha value 0.899 indicates that the average correlation among the ten items in the questionnaire indicates satisfactory reliability

Table 1 - Reliability Statistics test results

Cronbach's Alpha	Cronbach's Alpha based on Standardized items	Number of items
0.899	0.861	10

4.2 Chi Square Test Results

Pearson's chi-square test was used to examine the impact of each independent variable on curb side overtaking maneuvers on roadways in this study. The findings revealed that the dependent variable "Have you overtaken from the curbside?" had a significance relationship with the majority of the variables. A significance level (α or alpha) of 0.05 was used to check association with the dependant variable. The variables gender, age, occupation, driving license status, vehicle type, accident involvement, awareness of rules, sufficiency of rules, charged a fine, and mostly overtaking vehicle type had a significant association between overtaken from the curbside.

Crosstabulation tables are used to evaluate which variable levels have the most influence on association, compare observed and predicted counts, or investigate the contribution to the chi-square statistic. Variables with the greatest differences can be identified by observing the discrepancies between observed and predicted cell counts. The observed count is the frequency that was observed in a certain cell of the crosstabs table. The expected count is the frequency that a cell is expected to have if the null hypothesis is correct. In below table it has shown the expected and observed values of our independent variable. The expected and observed values of our independent variable are displayed in Table 2.

According to Table 2 more females and less males have overtaken from curbside than expected. Age groups below 18 and 19-28 have overtaken from curbside than expected and at the same time age groups 29-38,39-48,49-58, and more than 50 observed values were less than expected. Respondents who work in the private sector and undergraduate students received greater values than predicted, while everyone else received lower values. Respondents with a learner's permit overtake from the curbside more than predicted, while those with a driver's license have a lower value than expected. Perhaps their lack of experience and carelessness led them to make this dangerous road move. Motorcycles and light vehicles overtook from the curbside more frequently than expected, but three-wheelers and heavier vehicles received lower values in the observation. Respondents who met accidents due to curbside overtaking are less than expected and respondents who charged a fine due to curbside overtaking are more than expected.

Table 2: Expected and Observed counts of the variables

Dependent variable: Overtaking slow moving vehicle from curbside			**Never**	**Rarely**	**Occasionally**	**Sometimes**	**Always**
1. Gender	Male	Observed	11	77	66	81	56
		Expected	16.2	67.7	55.5	79.9	71.7
	Female	Observed	13	23	16	37	50
		Expected	7.8	32.3	26.5	38.1	34.3
2. Age	<18	Observed	2	1	0	9	18
		Expected	1.7	7	5.7	8.2	7.4
	19-28	Observed	14	24	23	50	71
		Expected	10.2	42.3	34.7	49.9	44.9
	29-38	Observed	4	15	14	10	0
		Expected	2.4	10	8.2	11.8	10.6
	39-48	Observed	0	37	31	32	10
		Expected	6.1	25.6	21	30.2	27.1
	49-58	Observed	3	21	11	14	7
		Expected	3.1	13	10.7	15.4	13.8
	>59	Observed	1	2	3	3	0
		Expected	0.5	2.1	1.7	2.5	2.2
3. Occupation	Government employee	Observed	8	7	8	11	10
		Expected	2.5	10.2	8.4	12.1	10.8
	Private sector employee	Observed	8	19	21	49	62
		Expected	8.9	37	30.3	43.6	39.2
	own Business	Observed	0	15	13	9	0
		Expected	2.1	8.6	7.1	10.2	9.1
	Undergraduate	Observed	3	7	4	7	16
		Expected	2.1	8.6	7.1	10.2	9.1
	Driving	Observed	2	42	27	26	0
		Expected	5.4	22.6	18.5	26.6	23.9
	Other	Observed	3	10	9	16	18
		Expected	3.1	13	10.7	15.4	13.8
4. License Availability	Full license	Observed	15	93	75	75	44
		Expected	16.9	70.4	57.7	82.4	74.6
	Learners Permit	Observed	7	3	4	33	49
		Expected	5.4	22.4	18.3	26.2	23.7
	No license	Observed	2	4	3	9	13
		Expected	1.7	7.2	5.9	8.5	7.7
5. Mostly Drive/ Travel in Vehicle	Motorcycle	Observed	10	10	11	19	35
		Expected	4.7	19.8	16.2	23.3	21
	Light Vehicles	Observed	13	25	17	46	58
		Expected	8.9	37	30.3	43.6	39.2
	Heavy vehicles	Observed	0	18	19	16	1
		Expected	3	12.6	10.3	14.8	13.3
	Three wheelers	Observed	1	47	35	35	12
		Expected	7.3	30.2	24.8	35.7	32
	Others	Observed	0	0	0	2	0
		Expected	0.1	0.5	0.4	0.5	0.5
6. Accidents due to Overtaking	Yes	Observed	2	45	44	42	8
		Expected	7.9	32.8	26.9	38.7	34.8
	No	Observed	22	55	38	76	98
		Expected	16.1	67.2	55.1	79.3	71.2
7. Awareness of rules about Overtaking	Yes	Observed	23	81	65	102	86
		Expected	19.9	83	68.1	98	88
	No	Observed	0	13	5	11	11
		Expected	2.2	9.3	7.6	11	9.9
	unable to accessed	Observed	1	6	12	5	9
		Expected	1.8	7.7	6.3	9.1	8.1

Table 2: Expected and Observed counts of the variables continue..

Dependent variable: Overtaking slow moving vehicle from curbside			Never	Rarely	Occasionally	Sometimes	Always
8. Enough rules have been taken	Yes	Observed	20	57	45	77	94
		Expected	16.4	68.1	55.9	80.4	72.2
	No	Observed	4	38	21	33	10
		Expected	5.9	24.7	20.2	29.1	26.1
	unable to accessed	Observed	0	5	16	8	2
		Expected	1.7	7.2	5.9	8.5	7.6
9. Stopped or Charged by police	Yes	Observed	20	56	66	97	98
		Expected	18.8	78.4	64.3	92.5	83.1
	No	Observed	4	44	16	21	8
		Expected	5.2	21.6	17.7	25.5	22.9
10. Mostly Overtaking Vehicle Type	Light motorcycles	Observed	17	33	10	78	98
		Expected	13.2	54.9	45	64.8	58.2
	motorcycles	Observed	3	20	13	0	0
		Expected	2	8.4	6.9	9.9	8.9
	Motor tricycles	Observed	0	21	29	10	3
		Expected	3.5	14.7	12	17.3	15.5
	Light vehicles	Observed	2	2	11	21	3
		Expected	2.2	9.1	7.4	10.7	9.6
	Motor lorries	Observed	1	11	10	5	0
		Expected	1.5	6.3	5.1	7.4	6.7
	Multi axial	Observed	0	6	6	3	0
		Expected	0.8	3.5	2.9	4.1	3.7
	Others	Observed	1	7	3	1	2
		Expected	0.8	3.3	2.7	3.8	3.5

4.3 Multinomial Logistic Regression Test Results

A multivariate extension of a chi-square study of three or more dependent categorical outcomes is multinomial logistic regression. A reference category is chosen from the levels of the multilevel categorical outcome variable in multinomial logistic regression, and subsequent logistic regression models are run for each level of the outcome and compared to the reference category. In this study "Always" was taken as the reference category. Likert scale questions were analyzed using this method. The parameter estimates show how each choice on the Likert scale compares to the reference category option (always) of the dependent variable "Have you overtaken from the curbside?" As indicated in Table 3, there are 34 parameter estimates values, with 18 of them having significant values less than 0.05.

The first set of results from Table represents comparison between those who chose the option "Never" and those who opted "Always". From those set of results, ten parameters are statistically significant, having a significant value less than 0.05. One of above from category "Never" is use horn while overtaking (P = 0.027). β value of that variable is 0.585 and it is positive. This positive number indicates that participants who responded positively to the Likert scale item "Use horn during curbside overtaking" were more likely to choose Never rather than Always for the variable "Use horn while curbside overtaking". If I explain it in a more simplify manner, drivers who overtake slow drivers from the curbside are never use horn while overtaking. Also, they never check police locations before overtaking, never check the space between front vehicle before overtaking according to the results of this table. When β value of the variable is negative it means that respondents are more likely to choose always over never in following variables. Carelessness and less experience are always common reasons for curbside overtaking according to the respondents and drivers check the road type whether it is rural or urban before curbside overtaking, care about the weather condition and always indicate signals when changing lanes. From the category "Sometimes", Checking the road type before curbside overtaking has a significance value of 0.002 and it has a β value of -0.696 but negative. Negative β value indicates that participants who responded negatively to the Likert scale item " Checking the road type before curbside

overtaking " were less likely to choose sometimes rather than Always for the variable " Checking the road type before curbside overtaking". According to the parameter estimation table drivers sometimes use horn while overtaking and check the space between front vehicle before overtaking.

Table 3: Parameter estimates of Multinominal Logistics Regression

Variable		β	Sig.
Never	Reasons for wrong side overtaking according to you- CARELESS	-0.654	0.008
	Reasons for wrong side overtaking according to you - LESS EXPERIENCE	-0.832	0.000
	Use horn while overtaking?	0.585	0.027
	Check the road type before overtaking? (Urban/ Rural)	-0.621	0.007
	Check whether police locations before overtaking?	0.696	0.014
	Care about the weather condition before overtaking? (Heavy rain/ Mist)	-0.865	0.011
	Check the space between front vehicle before overtaking	0.541	0.018
	Overtake slow drivers from the left side?	-1.232	0.000
	Indicate signals when you are changing lanes	-0.641	0.017
	Care about the weather condition before overtaking? (Heavy rain/ Mist)	-1.362	0.000
Sometimes	Reasons for wrong side overtaking according to you - LESS EXPERIENCE	-0.482	0.019
	Use horn while overtaking?	0.595	0.020
	Check the road type before overtaking? (Urban/ Rural)	-0.696	0.002
	Wait till visible the road ahead vehicle?	-0.863	0.001
	Check the space between front vehicle before overtaking	0.489	0.015
	Overtake slow drivers from the left side?	-0.901	0.000
	Use horn while overtaking?	-0.437	0.075
	Care about the weather condition before overtaking? (Heavy rain/ Mist)	-1.088	0.001
Dependent variable: Overtake slow drivers from the curb side? Note: Only significant variables are tabulated.			

5 CONLUSIONS

Overtaking slower moving vehicles from curbside in Sri Lanka investigated in this study. Questionnaire forms with Likert scale questions were collected. From this study drivers' curbside overtaking behavior was investigated also drivers' perception about current rules and regulations regarding curbside overtaking was investigated. The developed questionnaire was validated using Cronbach's alpha method that the value was 0.899 which is in acceptable level. This value is a good indication about the average correlation among the Likert scaled questions from the questionnaire. Chi-square test and multinomial logistic regression were used to analyze the data. From chi-square test some significance variables were found out such as gender, age, occupation, driving license availability, vehicle type, accidents happened before and charged a fine before due to curbside overtaking. Likelihood ratio test values from the multinomial logistic regression show that use horn while overtaking, check the road type while overtaking, check police locations before overtaking, wait till visible the road ahead vehicle, check weather condition, check space between front vehicle, indicate signals when changing lanes are the significant variables for the dependent value "have you overtaken from curbside".

The findings of this study are consistent with prior research conducted in other countries. In many studies, wrong side overtaking has been identified as a risky riding behavior which cause traffic accidents. In this study it is revealed that young male drivers are more likely to do wrong side overtaking and same results have been found in a study done by Lorca et al. (2013) in Spain. Motorcycles are identified as mostly overtaking vehicle type in our study as well as a study done by Mehta et al (2015) in India. Research done by Kashani et al (2016) in Iran found that overtaking maneuver was lower among drivers who knew where police locations are and same results can be seen in our study too. However,

curbside overtaking of slow vehicles was not clearly recognized to the authors' knowledge. The majority of overtaking study was carried out in nations with similar traffic conditions and driving behavior as Sri Lanka. Since there were no research about wrong side overtaking conducted in Sri Lanka this study helps to fill the research gap to some extent.

To overcome this curbside overtaking habit, several solutions can be suggested. According to several research, policymakers should implement driver-education and public-awareness campaigns. The suggested goals of these initiatives are to educate the public about the dangers of overtaking maneuvers and to reduce the number of dangerous drivers who engage in these activities on a regular basis, potentially leading to traffic accidents. According to several research, increasing the fine for curbside overtaking as well as imposing new laws for curbside overtaking will cause drivers to abandon the harmful practice. Finally, if these countermeasures will be successful in reducing curbside overtaking on the road. Also, it is suggested to investigate curbside overtaking behavior in rural areas of Sri Lanka.

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