



## Fatal road traffic accidents in Mauritius (2006 – 2011) – A retrospective study

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### ABSTRACT

Road traffic injuries are the leading cause of death worldwide. It is a real public health challenge for all the concerned agencies in reducing the number of road accidents. Road traffic accidents are becoming alarming in Mauritius and the present study was carried out to analyze the trends of fatal road traffic accidents in Mauritius from January 2006 to December 2011. The data was reviewed from the records of Traffic Management and Road Safety Unit, and the Ministry of Public Infrastructure, Land Transport and Shipping with ethics clearance obtained from the Ministry of Health and Quality of Life. A total of seven hundred and seventy seven (777) fatal road traffic accidents were reported during the study period. The road traffic accidents involving male drivers outnumbered those of female drivers. Most of the fatalities recorded occurred during weekends (35.26%), especially on Sundays. About half of the cases (51%) belonged to 16 – 44 years age group. Pedestrians and riders comprised of 63.4% of all the victims of fatal accidents. Given that young and productive males and females that can contribute the economic growth of a nation lose their lives unnecessarily in road traffic accidents, the outcome of this study can help the planners to take safety measures, to implement strict traffic rules, to risk stratification in the susceptible population and to educate the people regarding road safety measures.

**KEY WORDS:** *Road traffic accidents; Gender; Age; Road users; Road safety measures; Public health challenge; Retrospective study; Mauritius*

### INTRODUCTION

The WHO Global status report on road safety 2015 indicates that worldwide the total number of road traffic deaths has plateaued at 1.25 million per year, with the highest road traffic fatality rates in low-income countries and the most common in Young adults aged between 15 and 44 years.<sup>1</sup> Speeding, driving under the influence of alcohol, riding without restraint, poor vehicle maintenance and poor road conditions are some of the etiological factors of fatal crashes. The number of road traffic accidents increased by 12.0% from 23,563 in 2013 to 26,400 in 2014 including 125 fatal cases which was up by 5% from the preceding year.<sup>2</sup> Many studies have been conducted worldwide on patterns of road traffic fatalities and the risk factors<sup>3-10</sup> while

the current status of literature shows one study<sup>11</sup> on road traffic accidents in Mauritius. Clarke *et al*<sup>9</sup> observed that over 65% of the accidents occurred due to driving at excessive speed, a driver in excess of the legal alcohol limit, or the failure to wear a seat belt, or some combination of these. A cross-sectional study in Tirana district, Albania showed that younger age, high speed and alcohol consumption were strong and significant predictors of fatal accidents.<sup>10</sup> Agnihotri *et al*<sup>11</sup> studied fatal road traffic accidents associated with alcohol consumption in Mauritius and found that road traffic accidents were reduced in number after the Amendment of the Road Traffic Act which decreased the maximum permissible blood alcohol concentration from 0.08% to 0.05%. However, studies concerning fatal road traffic accidents in terms of day and place of occurrence and category, age and gender of victims are very limited in Mauritius. This highlights the need for a study on the epidemiology of traffic fatalities on the roads of Mauritius. This study analyzed the trend of fatal road accidents in Mauritius over a 6-year period (2006-2011) in order to understand and determine potential preventive measures.

## METHODOLOGY

A retrospective analytical study on fatal road traffic accidents was conducted in the year 2012. Ethics clearance was obtained from the Ministry of Health and Quality of Life on 15 June 2012. Permission was obtained from the Police department to access data. A data over the last six years from January 2006 to December 2011 obtained from the Traffic Management and Road Safety Unit, and the Ministry of Public Infrastructure, Land Transport and Shipping were analyzed. All road users, irrespective of age, involved in fatal road traffic accidents in Mauritius, were included in the study. Subjects who passed away in the fatal accidents were classified as victims.

Drivers who passed away in the fatal accident were also classified under the victim category. Hit and run cases were excluded because of lack of information about those cases. The victims were also studied in terms of their category as road user. The category "driver" referred to car, bus and lorry driver, "rider" to motorcycle rider, "cyclist" to cycle rider, "pillion rider" to passenger on the motorcycle, "passenger" to seated passengers of car, bus and lorry, "helper" to anyone who was the standing passenger in the lorry and "conductor" to bus conductor. Excel 2007 was used for the statistical analysis of data.

## RESULTS

**Figure 1** shows the distribution of fatal road traffic accidents in Mauritius from 01 January 2006 to 31 December 2011. A total of 838 victims (Male 703; Female: 135) were recorded during this period including 777 fatal accidents. The number of traffic fatalities has been fluctuating from 2006 to 2011 with majority of fatal accidents in year 2008 and 2010.

**Figure 2** shows the distribution of fatal accidents according to the day of occurrence. Almost half of all fatal road traffic accidents were reported during weekends especially on Saturdays and Sundays.

**Table 1** shows the district wise distribution of fatal accidents. Pamplemousses (19.69%) and Plaines Wilhems (19.18%) were the most common districts accounting for 39% fatalities. Savanne had the lowest fatal accidents.

**Table 2** shows the distribution of victims classified as per road user category. Most fatal collisions involved pedestrian victims, accounting for about 34.5% of all victims followed by riders (28.9%).

**Table 3** shows the age group groups of victims involved in fatal road accidents. About half the victims were aged 16 to 44

years with commonest affected age group

16 – 29 years (27.8%).

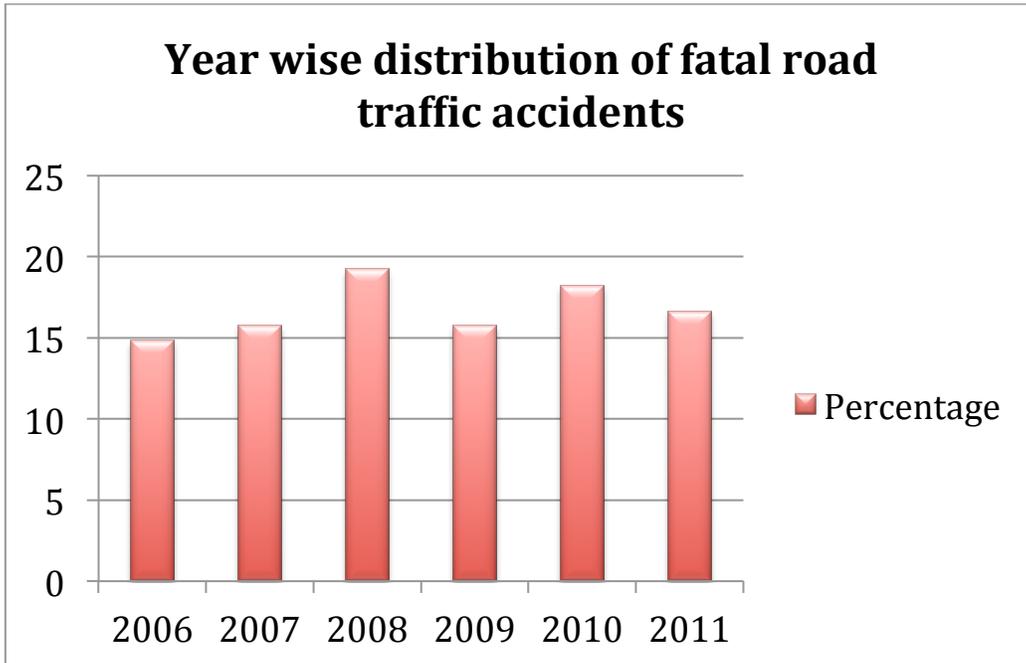


Figure 1: Year wise distribution of fatal road traffic accidents

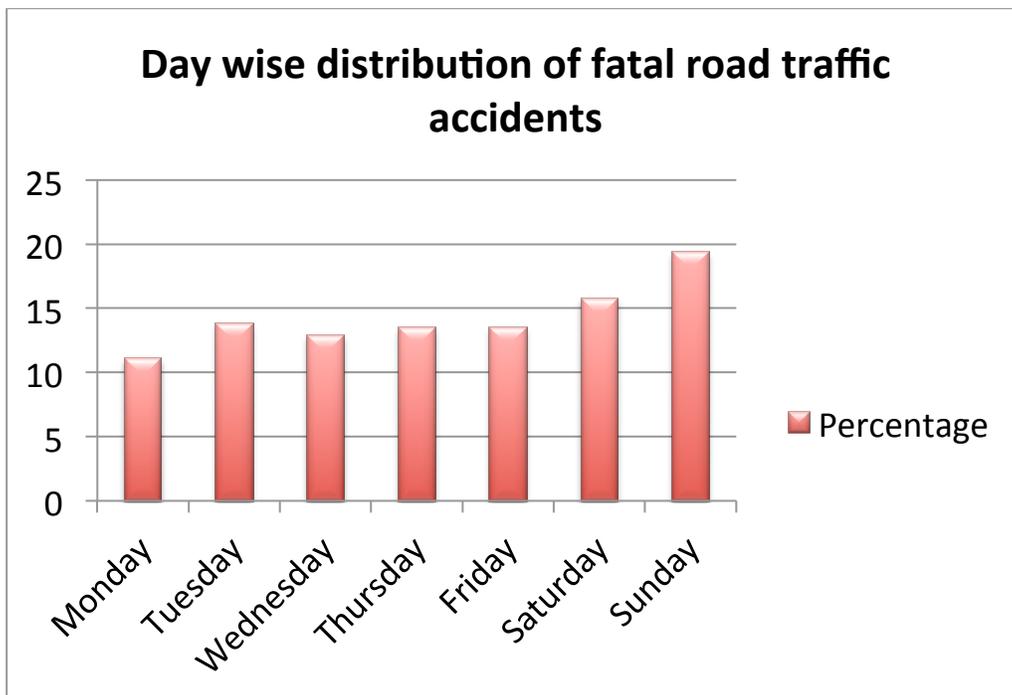


Figure 2: Distribution of fatal road traffic accidents by day

**Table 1: Distribution of fatal road traffic accidents by District**

District	Number	Percentage
Port Louis	111	14.29
Pamplemousses	153	19.69
Plaines Wilhems	149	19.18
Moka	68	8.75
Flacq	73	9.40
Grand Port	66	8.49
Savanne	33	4.25
Black River	50	6.44
Rempart	74	9.52
<b>Total</b>	<b>777</b>	<b>100.01</b>

**Table 2: Classification of victims by category of road user**

Category	Number of victims	Percentage
Pedestrian	289	34.44
Rider	242	28.88
Driver	112	13.37
Passenger	88	10.50
Cyclist	69	8.23
Pillion Rider	30	3.58
Helper	7	0.84
Conductor	1	0.12
<b>Total</b>	<b>838</b>	<b>100.01</b>

**Table 3: Classification of victims by age**

Age of victims (years)	Number of victims	Percentage
<15	39	4.65
16-29	233	27.80
30-44	195	23.27
45-59	199	23.75
≥60	161	19.21
N/A	11	1.31
<b>Total</b>	<b>838</b>	<b>99.99</b>

## DISCUSSION

Road traffic accidents are a major cause of death in developing and developed countries. The high-risk groups need to be identified towards which preventive measures should be directed. The results of present study demonstrate that fatal road traffic accidents were common during weekends, especially on Sundays. This may be due to a higher traffic flow during weekend topped up with increased alcohol consumption during weekend. Indeed the study of Pigman *et al*<sup>12</sup> showed that in rural areas, most accidents occurred on Saturdays, Fridays and Sundays. Similar picture was seen for two-lane roads with accidents being more common on Sundays and Saturdays, while for expressways maximum accidents occurred on Sundays. During weekend there is usually a higher volume of traffic and the associated congestion might amount to increased fatal RTAs. Alcohol-linked accidents occur mostly at nighttime and towards the end of the week<sup>13</sup>. Since almost 50% of all traffic fatalities in Mauritius occur from Friday to Sunday, all measures aiming to prevent accidents in general should be accentuated towards the end of the week and during weekends.

The Pamplemousses and Plaines Wilhems regions of Mauritius had the highest number of fatal road traffic accidents. The study of Wyss *et al*<sup>13</sup> also showed increased fatal RTAs in urban areas on Saturdays were usually due to higher traffic volumes linked to shopping. Plaines Wilhems is the most populous district and mainly urban having numerous shopping places and malls with a high traffic density during weekends. As far as Pamplemousses is concerned, it is a rural area through which the motorway passes and the speed limit on motorways (110 km/h) being widely more than on two-lane roads (60 km/h), may contribute to an increased number of fatal accidents as a result of speeding. Port Louis being a capital

(urban) has less number of accidents as compared to Pamplemousses that may be due to slow traffic. Savanne is mainly rural having a smallest population density, had the lowest fatal accidents that could be due to low traffic density on the roads. In contrast with our findings, Liu *et al*<sup>14</sup> reported that rural roads are more likely to be the scene of run-of-road crashes as compared to the urban roads. Wilson *et al*<sup>15</sup> assessed the impact of speed cameras on speeding, road crashes, crashes causing injury and fatalities, and concluded that speed cameras are a worthwhile intervention for reducing the number of road traffic injuries and deaths. Skubic *et al*<sup>16</sup> reported a twofold increase in the trauma center admissions who were injured in motor vehicle crashes due to the removal of speed cameras.

The most common victim group comprised of pedestrians and riders, and belonged to 16-29 years age group. The studies conducted by Banthia *et al*<sup>3</sup>, Dulal *et al*<sup>4</sup>, Hijar *et al*<sup>5</sup>, Crilly<sup>6</sup> and Valent *et al*<sup>7</sup> argued that the most vulnerable victims to traffic fatalities were pedestrian and young adults. According to Banthia *et al*<sup>3</sup>, fifty percent RTA cases belonged to 21-40 years age group and Dual *et al*<sup>4</sup> found most venerable age group from 15 – 45 years. Liu *et al*<sup>14</sup> observed that young male drivers of age 15 to 24 years are more likely to be involved in run-of-road crashes as compared to other age groups of driver. Participants distracted by music or texting were more likely to be hit by a vehicle in the virtual pedestrian environment than were undistracted participants.<sup>17</sup> It is also observed that technological and social distractions increase crossing times, which are associated with the highest risk of pedestrian injuries.<sup>18</sup> The 3-day WalkSafe educational curriculum implemented in a high-risk district was shown to increase the pedestrian safety knowledge of elementary school age children.<sup>19</sup> Agnihotri *et al*<sup>8</sup>

concluded in a one year hospital based study that the traffic casualties of motorcyclists and pedestrians are considered a major problem in Nepal. Driving course to motor cycle drivers with emphasize on the road posters signal rules and regular checkup of their motor cycles especially commercial motor cycle<sup>20</sup>, mandatory pre-license training<sup>21</sup> and motorcycle helmets<sup>22</sup> are to be introduced as the preventable measures to reduce fatal motor cycle traffic accidents. Regarding motor cycle rider training, according to Kardamanidis *et al*<sup>20</sup>, most studies suffered from serious methodological weaknesses such as detection bias due to the poor use of outcome measurement tools, small sample sizes and short follow-up time after training therefore unable to draw any conclusions about the effectiveness of rider training on crash.

Liu *et al*<sup>14</sup> contended that the driver sleep, drivers with alcohol use, roadway alignment with curve, speeding vehicle, passenger car, road conditions, high speed limit road, and adverse weather are significant factors related to the high risk of fatal road traffic accidents.

## CONCLUSION

It is concluded that most of the factors responsible for road traffic accidents and its fatal consequences are preventable. There is a need for road safety education and a comprehensive multipronged approach to mitigate most of them. It remains critical for the national/country's Department of Transport and the Law Enforcement Agency worldwide to embrace the tide of the causes of fatal road traffic accidents and develop coherent strategies towards prevention such as the riders' training that needs rigorous research for its effectiveness, speed cameras, the pedestrian safety knowledge of school age children and improvement in roadway design.

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