LEADING CONTRIBUTORY FACTORS FOR ROAD TRAFFIC ACCIDENTS IN SRI LANKA

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According to the records of traffic headquarters, road traffic accidents are increasing at an alarming rate in Sri Lanka. Number of deaths and critical injuries report due to road traffic accidents are unbearable to a country like Sri Lanka. The data set used for the current study includes traffic accident information collected from traffic headquarters from January 1, 2014, through December 31, 2014. An exploratory analysis was conducted followed by factor analysis to identify the factors that significantly affect the severity of accidents. Moreover, Hotspots are used to identify the divisions and places more prone to accidents followed by cluster analysis to identify the factors that contribute to accidents. Circular statistical analysis was used to detect circular variables in data and their behavior, Hierarchical and K-modes clustering to cluster data, and GIS mapping to map data concerning DS (Divisional Secretariats) divisions and police stations. Among 35,964 accidents in 2014, 2260 deaths, 19,851 severe injuries, and 13,853 damages were reported. Most of them were in the 30-50yrs age group. The highest number of accidents were in Western provinces. Also, high in *Colombo, Nugegoda, Kelaniya, Gangawatakorale (Kandy)* and *Gampaha* DS divisions. Cities such as *Kurunduwatta, Maharagama, Kadawatha, Kandy* and *Gampaha* are more prone to accidents. More accidents were reported in rural areas than the urban area. From January to December, there is a noticeable increase in the number of accidents. Days of the week, months on year show the same circular accident counts throughout the respective time. In addition, the *A-grade* roads are the most vulnerable to accidents and not safe for drivers/pedestrians. Neither clustering algorithm was able to produce a viable clustering structure. However, factors that can influence accident severity, which are Environmental factors (road surface, light condition, weather condition, and location type), Driver/rider age limit, driver/rider gender, human factor, pedestrian factor, vehicle factor, alcohol test, and traffic control were identified. Circular data, hourly, monthly, daily, weekly, and direction wise gave the same pattern throughout the year. Finally, we have a plethora of knowledge regarding Sri Lankan road traffic accidents, which we can use to develop better data collection methods that will assist reduce traffic accident statistics.

Keywords: Circular Statistics, Exploratory Factor Analysis, Hierarchical Clustering, Hotspot Identification, Road accidents and Traffic