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ANALYSIS OF ROAD TRAFFIC INJURIES, HOSPITALIZATION PATTERNS AND MORTALITY IN SRI LANKA: EPIDEMIOLOGICAL TRENDS AND CONTRIBUTORY FACTORS

Introduction

Road traffic injuries (RTIs) represent a critical global public health challenge, resulting in over 1.35 million fatalities annually. Alarmingly, approximately 93% of these deaths occur in low- and middle-income countries, which bear a disproportionate burden of this preventable epidemic [1]. Beyond the immediate loss of life, RTIs impose a substantial economic strain on developing nations, with costs related to medical care, lost productivity, and property damage estimated at 1–3% of their gross domestic product (GDP) [2].

Sri Lanka is profoundly affected by this issue. Epidemiological data indicate that approximately one in seven Sri Lankans is hospitalized annually due to accidents. Of the roughly 145,000 deaths reported each year, nearly 12,000 are attributable to accidents, with an estimated 70% of victims succumbing to their injuries before reaching a medical facility [3]. Globally, RTIs are currently the seventh leading cause of death and are projected to rise to the fifth position by 2030 if prevailing trends persist [1].

The distribution of fatalities by vehicle type reveals specific areas of concern. According to the Central Bank of Sri Lanka's 2023 Road Safety Report, buses and passenger vehicles are implicated in approximately 60% of road traffic fatalities. Motorcycles contribute to around 35% of reported accidents, and three-wheelers account for about 12% [4]. Sri Lanka's road traffic death rate remains notably high, being twice that of high-income countries and approximately five times higher than the rates observed in the world's safest nations [5].

This persistent high mortality is exacerbated by infrastructural deficiencies and behavioral risk factors. Nearly 40% of the nation's road network is classified as being in poor or very poor condition [4]. Human factors are equally critical, with alcohol or drug use implicated in 45% of accidents and speeding in approximately 40% [4].

The clinical consequences of RTIs are often severe, including complex vascular trauma. The affected population is predominantly young adult males (87%), with a mean age of approximately 37 years [6].

This study, therefore, aims to systematically analyze the epidemiological patterns of RTIs in Sri Lanka, focusing on injury incidence, hospitalization rates, mortality patterns, and the principal contributing factors to inform targeted interventions and improve trauma care systems.

Goal

The primary objective of this study is to analyze the epidemiological patterns of road traffic injuries in Sri Lanka, with particular emphasis on injury incidence, hospitalization rates, mortality patterns, and the main contributing factors. By examining these aspects across diverse settings and regions, the study seeks to identify high-risk populations and the primary causes of accidents, thereby generating evidence to inform and enhance road safety policies and trauma care strategies.

Material and methods of research

This retrospective epidemiological study was conducted using secondary data obtained from published reports, peer-reviewed research articles, and official statistical databases. The principal

data sources included reports and databases from the Sri Lanka Police, the Ministry of Health, the Central Bank of Sri Lanka, the Sri Lanka Road Development Authority, and the Sri Lanka Road Safety Council. Supplementary information was derived from World Health Organization (WHO) reports [1], the Central Bank of Sri Lanka's 2023 Road Safety Report [4], relevant peer-reviewed studies [2, 6, 7], and media reports [3, 5].

The extracted data encompassed information on accident characteristics, victim demographics, injury patterns, hospitalization parameters, mortality statistics, and contributing risk factors. Data were synthesized and are presented using descriptive statistics, including numbers, percentages, and mean values, to provide a clear and comprehensive overview of the findings.

The results of the research and their discussion

The analysis of road traffic injury patterns in Sri Lanka reveals a significant and disproportionate burden on the healthcare system and specific population subgroups. A synthesis of key epidemiological indicators is presented in Table 1.

Table 1 – Epidemiological Indicators of Road Traffic Injuries in Sri Lanka

Parameter	Finding	Data Source
Annual accident-related hospitalizations	~1 in 7 Sri Lankans	Minister of Health [3]
Annual accident-related deaths	~12,000	Minister of Health [3]
Pre-hospital mortality rate	~70%	Minister of Health [3]
Vascular injuries caused by RTA	44.66%	National Hospital Sri Lanka [6]
Male predominance in vascular trauma	87.38%	National Hospital Sri Lanka [6]
Mean age of vascular injury patients	37.13 years	National Hospital Sri Lanka [6]
Fatality involvement – buses/passenger vehicles	60%	Central Bank Report 2023 [4]
Accident involvement – motorcycles	35%	Central Bank Report 2023 [4]
Accident involvement – three-wheelers	12%	Central Bank Report 2023 [4]

As detailed in Table 1, RTIs constitute a major health burden in Sri Lanka, with approximately one in seven individuals requiring hospitalization annually due to accidents 33. The high pre-hospital mortality rate of approximately 70% suggests critical challenges in the timely delivery of emergency medical services and access to effective trauma care [3]. Vascular trauma predominantly affects young adult males, with a mean age of 37 years and 87% of cases occurring in men 66. This demographic profile underscores the significant impact of RTIs on the economically active segment of the population.

Analysis of vehicle involvement reveals distinct trends. Buses and passenger vehicles are associated with a disproportionate share (60%) of fatalities 44, pointing to potential safety deficiencies within the public transport sector. Conversely, motorcycles, involved in 35% of reported accidents, reflect their inherent vulnerability in mixed-traffic environments [4]. Three-wheelers contribute to approximately 12% of accidents, representing a smaller, yet still notable, proportion of incidents [4].

A detailed examination of contributory factors and infrastructural conditions is presented in Table 2.

Human factors emerge as the predominant contributors to road traffic accidents in Sri Lanka. Alcohol or drug use (45%), speeding (40%), and driver negligence (57%) are among the most frequently cited causes 2,42,4. These behavioral risks are compounded by substandard road infrastructure, with approximately 40% of the national road network classified as being in poor or very poor condition [4].

Table 2 – Contributory Factors to Road Traffic Injuries in Sri Lanka

Factor Category	Specific Factor	Percentage
Human Factors	Alcohol/Drug Influence	45%
	Speeding	40%
	Driver Negligence	57%
	Aggressive Driving	14%
Infrastructure	Roads in Poor/Very Poor Condition	40%
Accident Types	Rear-end Collisions	26%
	Angle Collisions	18%
	Pedestrian Accidents	17%
Anatomical Location	Lower Limb Vascular Injuries	50.47%

The typology of accidents further elucidates underlying issues. The prevalence of rear-end collisions (26%) suggests challenges in maintaining safe speeds and following distances. Angle collisions (18%), frequently occurring at intersections, may indicate deficiencies in traffic management and control. Pedestrian accidents (17%) highlight the vulnerability of non-motorized road users and the need for improved pedestrian infrastructure [7].

Regarding injury patterns, lower limb vascular injuries constitute a substantial proportion (50.47%) of vascular trauma cases [6]. Injuries to the popliteal artery are particularly severe and pose a significant risk of limb loss without prompt and specialized surgical intervention. Notably, a significant number of vascular trauma cases present during evening hours, underscoring the necessity for adequate trauma care services during peak periods [6].

Conclusions

Road traffic injuries persist as a major public health crisis in Sri Lanka, characterized by high hospitalization rates and a substantial proportion of fatalities occurring prior to hospital arrival. Human factors, including alcohol use, speeding, and driver negligence, are the primary drivers of this epidemic, with poor road infrastructure acting as a significant exacerbating factor.

Young adult males constitute the most affected demographic, particularly in cases involving severe lower limb vascular trauma. These findings underscore the urgent need for a multi-faceted approach encompassing enhanced road safety legislation and enforcement, targeted public awareness campaigns, substantial investment in road infrastructure improvements, strengthened public transport safety protocols, and the development of a more robust and accessible trauma care system to mitigate the devastating impact of road traffic injuries in Sri Lanka.

LITERATURE

1. Road traffic injuries / World Health Organization // Fact Sheet. – Geneva: WHO, 2022. – 8 p.

2. Jayasinghe, B. C. Evaluating Geographical Variations of Road Traffic Accidents in Matara, Sri Lanka / B. C. Jayasinghe, N. C. Withanage, P. K. Mishra // Revue Internationale de Géomatique. – 2025. – Vol. 34. – P. 707–727.

3. Accidents hospitalize 1 in 7 Sri Lankans annually: minister / Xinhua // SriLankanNews.net. – 2025. – July 7.

4. Perera, S. How many more must die before Sri Lanka fixes its killer roads? / S. Perera // Sri Lanka Brief. – 2025. – May 15.

5. The Grim Reaper in overdrive // The Island. – 2025. – March 21.

6. Vascular injury pattern and workload: A tertiary care center experience from Sri Lanka / D. Ranasinghe, J. Arudchelvam, R. Cassim [et al.] // Sri Lanka Journal of Surgery. – 2024. – Vol. 42, № 1. – P. 12–18.

7. Karunarathna. M. D. S. M. Identification of accident black spots / M. D. S. M. Karunarathna, A. G. H. J. Edirisinghe, W. P. A. M. Pathirana // Journal of Sustainable Civil and Environmental Engineering Practices. – 2025. – Vol. 3, No. 2. – P. 1–15.