










SPECIAL COMMUNICATION

# Pursuing Health Sector Transformation Plan, Saudi Vision 2030: Establishing a Trauma Epidemiology Center to Reduce Road Traffic Injuries in Saudi Arabia

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## ABSTRACT

The burden of road traffic injuries (RTIs) continues to impact healthcare systems, with considerable economic losses worldwide. Risk factors associated with RTIs include young age, male sex, speeding, driving under the influence, non-use of seatbelts, unsafe road infrastructure, unsafe vehicles, diminished post-crash care, and inadequate traffic law enforcement. The rate of RTIs in the Kingdom of Saudi Arabia (KSA) has increased with more than 25,000 injuries and approximately 13.2 deaths per 100,000 population in 2020. In line with the KSA 2030 vision, a new trauma epidemiology center was established by the Saudi Red Crescent Authority, the national provider of prehospital services in KSA. It aims to reinforce traffic safety by identifying high-risk groups, providing updated traffic safety-related scientific materials, and reducing the mortality rate caused by vehicular crashes.

**Keywords:** Road traffic injuries, traffic safety, trauma, trauma epidemiology, Saudi Arabia.

## Introduction

The burden of road traffic injuries (RTIs) continues to impact healthcare systems with significant economic losses worldwide [1]. RTIs have caused over one million deaths in low- and middle-income countries and 20-50 million non-fatal injuries per year. In most countries, 3% of the gross domestic product is spent on vehicular crashes and their consequences. Risk factors linked to RTIs include young age, male sex, speeding, driving under the influence, non-use of seatbelts, unsafe road infrastructure, unsafe vehicles, diminished post-crash care, and inadequate traffic law enforcement [2]. The rate of RTIs in the Kingdom of Saudi Arabia (KSA) has increased with more than 25,000 injuries and approximately 13.2 deaths per 100,000 in 2020 [3,4]. A recent meta-analysis confirmed that excessive speeding is among the leading causes of RTIs in KSA. Vehicular crash surveillance was recommended to guide traffic safety measures [5]. In the 2030 vision of the KSA, the health sector was restructured to improve health services and reinforce traffic safety [6]. This has initiated a shared responsibility between the concerned authorities

for enforcing traffic regulations, ensuring road safety, and developing standards for road safety to curb the impact of RTIs in KSA [7-9]. Launched in July 2017, the Ministerial Committee of Traffic Safety coordinates traffic safety strategies, investigates vehicular crashes, implements safety measures, guides preventive programs, and shares traffic safety data [10]. As a part of this vision, a new Trauma Epidemiology Center (TEC) was established by the Saudi Red Crescent Authority (SRCA), the national provider of prehospital services in KSA. It aims to reinforce traffic safety by identifying high-risk groups using various epidemiological methods,

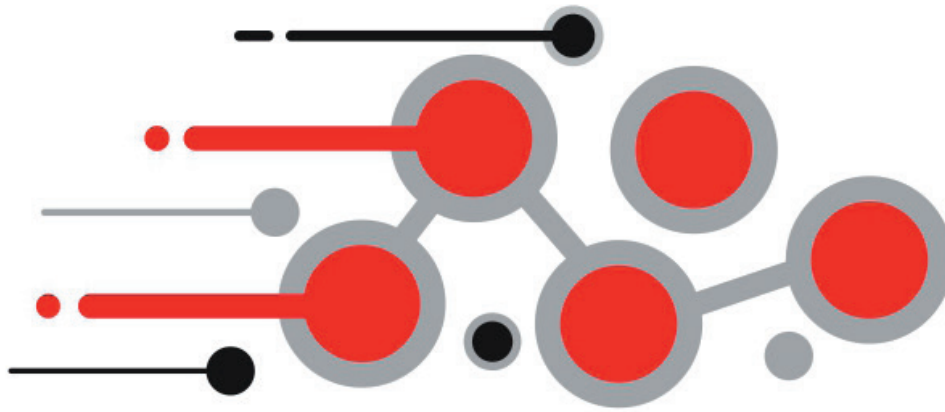
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**Figure 1.** TEC logo. The five circles signify the prevalence of traumatic injuries geographically. The color red symbolizes blood, while black symbolizes most affected areas. The lines, attached to the circles, represent data, and they signify speed as a factor in RTIs.

providing updated scientific materials, and supporting injury prevention programs [11,12].

The center's logo, as shown in Figure 1, was designed to illustrate the relationship between RTIs and trauma prevention data.

To address RTIs in the country, the TEC developed five main strategies, namely, (1) trauma surveillance and registry development, (2) reinforcing national trauma-related scientific research, (3) providing experts in trauma epidemiology, (4) supporting trauma prevention programs based on scientific evidence, and (5) community engagement in trauma prevention initiatives.

***First strategy: trauma surveillance and registry development***

Data are essential for identifying the major risk factors of RTIs in the country. The gathered data include the basic demographic variables, most affected areas (black spots), mechanisms of injuries, and vehicle types. Furthermore, RTIs are investigated using the Haddon Matrix according to the host, agent, physical, and social environment before, during, and after the incident [13]. The automation of live data after being cleansed and managed, followed by electronic projection on operational dashboards, and ending up with proper interpretations are key factors in trauma surveillance imposed by the TEC to guide policymakers in their decisions. Moreover, geographical information systems have been used to understand the location of RTIs by mapping incidents and identifying high-risk areas and factors influencing the frequency of RTIs [14]. This is performed via location-allocation analysis, spatial hazard analysis, accessibility analysis, network analysis, density analysis, and loop analysis [15-17]. Collectively, these pooled data develop a well-structured and accessible trauma registry.

***Second strategy: reinforcing national trauma-related scientific research***

Scientific research is important in providing up-to-date evidence in the field of trauma at the national and

global levels [18]. The sociodemographic variables, risk factors, locations of the incidents, and mechanisms of injury should be understood to promote awareness and conduct prevention programs in the target populations. Sharing data, related to prehospital and hospital services, including the clinical outcomes of RTIs, improves the quality of the related projects. Finally, papers regarding the active measures to reduce RTIs are worth investing in because they guide traffic safety enforcement [19,20].

***Third strategy: providing experts in trauma epidemiology***

Trauma epidemiology tackles several public health concepts to prioritize prevention over intervention. Consulting experts in the field of trauma epidemiology is vital to maintain and update the traffic safety programs. This is established through specialized programs, specialized courses, and frequent field exposures.

***Fourth strategy: supporting trauma prevention programs based on scientific evidence***

Strengthening traffic safety by documenting strategies and best practices in a scientific document with a validated structural framework periodically facilitates the dissemination of information learned from the traffic safety community to reduce RTIs.

***Fifth strategy: community engagement in trauma prevention initiatives***

Recognizing the impact of communities and their role in trauma prevention is crucial to enhance traffic safety and reduce mortality. Involving the public provides a shared responsibility among the community members to participate in awareness campaigns, providing basic interventions, such as cardiopulmonary resuscitation and bleeding control.

**Partnership with Concerned Entities**

The TEC has constantly sought for international collaboration opportunities and local partnerships

(Ministerial Committee of Traffic Safety, Ministry of Interior Affairs, Ministry of Transport, Saudi Standards, Ministry of Health, Ministry of Education, Ministry of Municipal and Rural Affairs, and many others) to effectively curb the prevalence of RTIs [7-10,21-23].

## Conclusion

The increase in traffic-related injuries has warranted the development of preventive measures. Launched by the SRCA, the TEC actively enforces traffic safety within the region. Its strategies include trauma surveillance and registry development, reinforcing national trauma-related scientific research, providing experts in trauma epidemiology, supporting trauma prevention programs based on scientific evidence, and community engagement in trauma prevention initiatives.

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## List of Abbreviations

KSA	Kingdom of Saudi Arabia
RTIs	Road Traffic Injuries
SRCA	Saudi Red Crescent Authority
TEC	Trauma Epidemiology Center

## Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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## Consent to participate

Not applicable.

## Ethical approval

Not applicable.

## Author contribution

YA, AA, SA developed the manuscript concepts, design, and intellectual content. HA, M Alsaihani, M Almazroa, and AA reviewed the literature. YA wrote the manuscript and ensured the integrity of the work. FA and JA reviewed the manuscript, and all authors approved the final version of the manuscript.

## Availability of data and materials

Further information is available from the corresponding author upon reasonable request.

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