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LETTER

Traffic Patterns and Emergency Medical Services Prenotification Transport Estimates in Trauma Activations [Letter]

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Dear editor

We are writing in response to the insightful article by Gorgens et al, titled "Traffic Patterns and Emergency Medical Services Prenotification Transport Estimates in Trauma Activations".[1] This study significantly enhances the limited literature on EMS prenotification accuracy by exploring discrepancies between estimated and actual transport intervals (ETI and ATI) during trauma activations. The authors' use of rigorous methodologies, such as the Wilcoxon Rank Sum test, effectively highlights key findings on EMS efficiency.

While commendable, the study could benefit from addressing several limitations. First, the analysis hypothesizes the impact of peak versus off-peak hours on transport discrepancies but lacks real-time traffic data. Integrating historical and live traffic data, including congestion levels and route-specific delays, could refine accuracy analysis. Second, focusing solely on an urban trauma center in Manhasset, NY, limits generalizability. Traffic dynamics and EMS practices vary widely across regions, necessitating broader datasets. Third, while GPS and navigation apps are mentioned, their utilization by EMS personnel remains unexamined. These technologies could offer insights into improving ETI accuracy.

To address these limitations, we propose the following approaches to advance research in this area. Future research should include live and historical traffic data from sources such as Google Maps, Waze, or local traffic control centers.[2] Additionally, integrating data from IoT devices that monitor road conditions and traffic density could provide a deeper understanding of how traffic influences ETI discrepancies. Conducting a multicenter study across urban, suburban, and rural settings would allow for comparative analysis and help identify location-specific and universal factors affecting ETI accuracy.[3] Incorporating data from regions with varying traffic infrastructures, such as areas with high congestion versus those with minimal traffic, could also enhance the study's impact. Developing machine learning models trained on diverse datasets, including real-time GPS data, weather conditions, historical traffic patterns, and patient characteristics, could significantly improve ETI predictions.[4] For example, an AI-based system could dynamically adjust ETI estimates based on factors like siren use, road conditions, and even local traffic enforcement policies. The application of *Edge Computing* could enable EMS vehicles to process data locally and provide real-time updates to receiving trauma centers, enhancing communication and decision-making. Future studies should explore how ETI discrepancies directly impact trauma patient outcomes, resource allocation, and interdisciplinary teamwork. Understanding this relationship could provide a stronger rationale for investing in technology-driven solutions.

In conclusion, the study by Gorgens et al is a vital contribution to EMS research and serves as a strong foundation for further exploration. By integrating broader datasets, leveraging advanced technologies like AI, and expanding research to diverse settings, we can develop systems that not only improve ETI accuracy but also enhance trauma care outcomes globally.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors utilized QuillBot and SciSpace to refine the language without altering the scientific substance of the manuscript.

Disclosure

The authors declare no conflicts of interest in this communication.

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