

Increased number of dispatches in emergency medical services correlates to response time extension

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Aim: This study investigated the correlation between the number of emergency medical service (EMS) dispatches and response time extension. In addition, we conducted a simulation to assess the potential for reducing response times by relocating the ambulance based on the number of dispatches.

Methods: This retrospective observational study analyzed data on patients treated with EMS between May 1st and June 25th, 2021, in an urban area (Chiba City, Japan). Spearman's rank correlation tests were used to analyze the correlations among the number of dispatches, response time extension, and ambulance distance. We created a heat map to visualize the number of dispatches and distribution of emergency case occurrences, and simulated the relocation of the EMS team with the lowest number of dispatches to the closest EMS team with the highest number of dispatches.

Results: In total, 7,915 emergency cases were included. The median response time across all dispatches was 9 minutes, whereas that for the response time extension cases was 12 minutes. There was a significant positive correlation between the increased number of dispatches, response time extension, and ambulance distance. The relocation simulation significantly shortened the average response time from 13 minutes and 30 seconds to 12 minutes and 11 seconds.

Conclusion: An increased number of dispatches significantly increased the response time extension cases and ambulance distance. Our simulation suggests that EMS relocation can potentially shorten the response time. While increased dispatches influence the response time extension, optimal EMS allocation may improve response times.

Keywords: Computer simulation, dispatch, emergency medical services, response time.

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List of Abbreviation

None.

Conflict of interests

T. Nakada is the CEO of Smart119 Inc. and Y. Tochigi is the employee of Smart119 Inc. The funding source had no role in the design, practice, or analysis of this study.

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Consent to participate

Not applicable.

Consent for publication

Not applicable.

Ethical approval

At our institution, ethical approval is not required for statistical analyses using anonymized data.