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Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine
(2025) 33:36
https://doi.org/10.1186/s13049-025-01345-y

Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine

MATTERS ARISING Open Access

Using the properties of the odds ratio to improve precision in meta-analysis: an update on the benefits of targeted deployment of physician-led interprofessional pre-hospital teams on the care of critically ill and injured patients

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The recent systematic review and meta-analysis titled "the benefits of targeted deployment of physician-led interprofessional pre-hospital teams on the care of critically Ill and injured patients" by Lavery and colleagues provides a useful review of the literature in an important research question [1]. The study also provides opportunity to refine its methods, and improve precision of the estimate of effect sizes, by utilising the symmetrical properties of the odds ratio. Given that the odds ratio for an outcome is the inverse of the odds ratio for other, mutually exclusive, outcomes [2], a simple inversion of mortality outcome effects will produce survival outcome effects, and allow pooling of all the outcomes reported in these studies.

This analysis was undertaken using the same random-effects pooling methodology as the original work with the meta package in R (R Foundation for Statistical Computing, Vienna, Austria) [3] and produces similar effect sizes with the benefits of increased precision, and potentially the improved interpretability of a single result (Fig. 1).

The opportunity was also taken to construct a funnel plot, which has some utility in the assessment of publication bias [4], which demonstrated visual symmetry, providing some reassurance that significant publication bias is unlikely (Fig. 2).

While this re-analysis does not mitigate the limitations of the initial study in terms of significant heterogeneity of study characteristics and outcome, it does provide a more efficient use of the available data. Improved understanding of the properties of commonly used statistical techniques is likely to result in more reliable results and greater interpretability of the available evidence.

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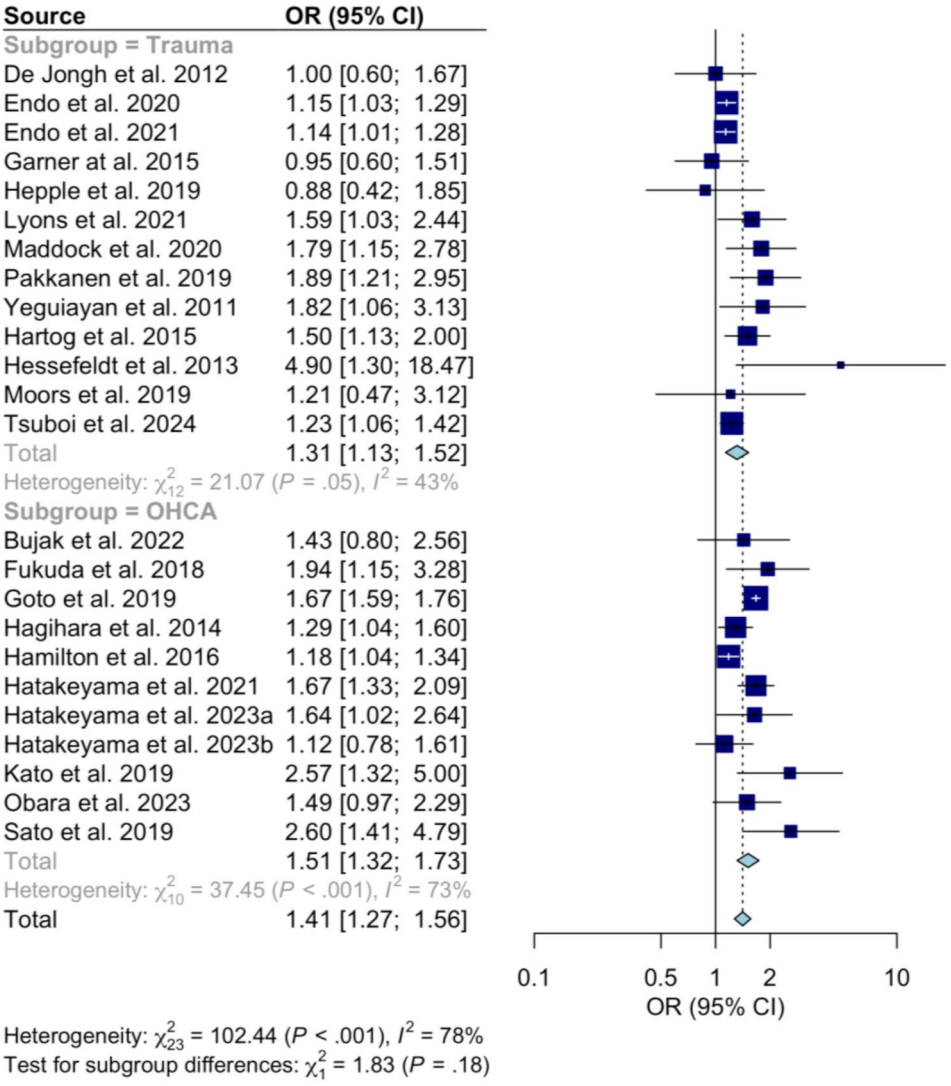

Fig. 1 A forest plot showing the survival outcomes in patients receiving physician-based care compared to standard care

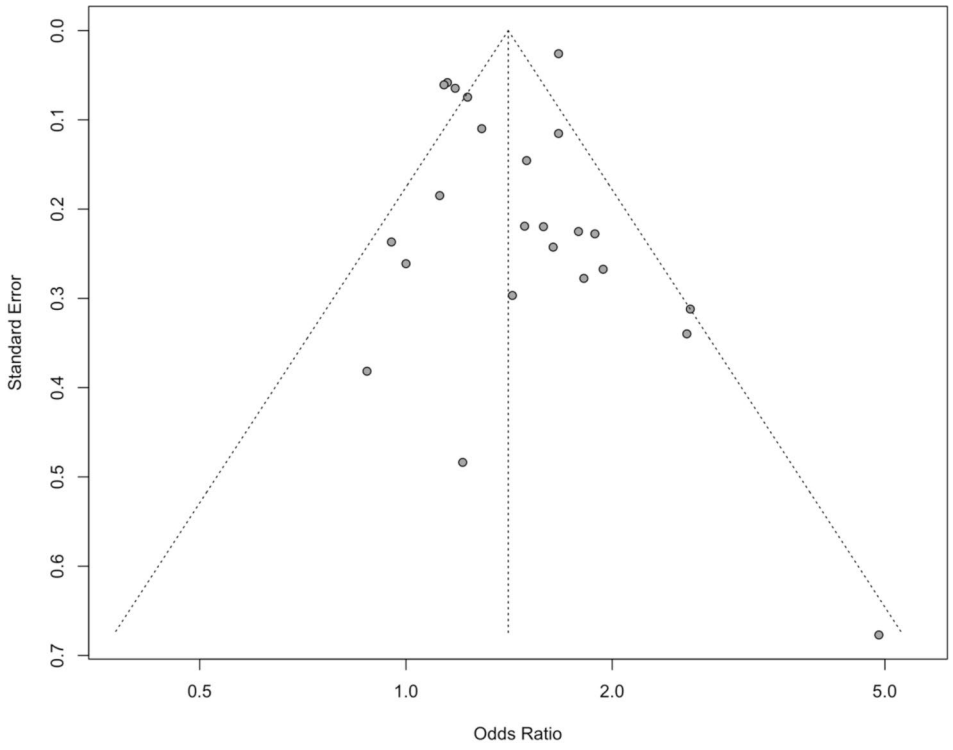

Fig. 2 A funnel plot for studies assessing outcomes in patients receiving physician-based care compared to standard care

Acknowledgements
The author is grateful for the encouragement of this submission by the senior author of the original work described.

Author contributions
RM is the sole author.

Funding
Unfunded.

Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 7 February 2025 / Accepted: 11 February 2025
Published online: 03 March 2025

References

1. Lavery MD, Aulakh A, Christian MD. Benefits of targeted deployment of physician-led interprofessional pre-hospital teams on the care of critically ill and injured patients: a systematic review and meta-analysis. Scand J Trauma Resusc Emerg Med. 2025;33(1):1.
2. Cummings P. The relative merits of risk ratios and odds ratios. Arch Pediatr Adolesc Med. 2009;163(5):438–45.
3. Balduzzi S, Rücker G, Schwarzer G. How to perform a meta-analysis with R: a practical tutorial. Evid Based Ment Health. 2019. pp. 153–60.
4. Lau J, Ioannidis JPA, Terrin N, Schmid CH, Olkin I. The case of the misleading funnel plot. BMJ. 2006;333(7568):597–600.

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