Research Brief

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The rank-heat plot is a novel way to present the results from a network meta-analysis including multiple outcomes

Summary

A particularly useful feature of network meta-analysis (NMA) is the ability to rank the effectiveness and safety of each intervention in the model for each outcome. There are numerous ways to present the NMA results, which can make their interpretation challenging for knowledge users. The rank-heat plot is a novel and simple graphical approach to improve the presentation of results from the treatment ranking analysis for multiple outcomes that may increase interpretability.

Implications

Treatment ranking in an NMA can be displayed with various graphical means, some of which can impede their application by knowledge users. Another challenge is the multitude of results from an NMA, which makes it difficult to present all data in a single table or figure in a way that is easy to interpret for readers. We propose the rank-heat plot, an efficient way to present the results of ranking statistics, particularly when a large amount of data is available. Clinicians can use the ranked-heat plot to discuss which agent is optimal across the different outcomes with their patients and caregivers; and guideline developers can use it to inform their recommendations, as well as policy makers, to decide about drug coverage.

Reference: Veroniki AA, Straus SE, Fyraridis A, et al. The rank-heat plot is a novel way to present the results from a network meta-analysis including multiple outcomes. J Clin Epidemiol. 2016;76:193-9.

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What is the current situation?

- Network meta-analysis (NMA) simultaneously compares multiple interventions for a clinical condition based on a network of trials and allows for ranking of treatments according to their effectiveness or safety

- NMA can be of great value to knowledge users (i.e., clinicians, policymakers, guideline developers); however, presenting NMA results in an accessible manner can be challenging

What is the objective?

To present a novel and simple graphical approach to improve the presentation of results of the treatment ranking in an NMA for multiple outcomes

How was the review conducted?

- The results of 3 previously published systematic reviews and NMAs were used to present different approaches for the graphical representation of the ranking statistics

- Three illustrative examples from previously conducted NMAs were used to represent small (3 outcomes and 8 treatments), medium (5 outcomes and 15 treatments), and large (5 outcomes and 30 treatments) datasets with respect to the number of treatments and outcomes studied in an NMA

- Graphical methods used to present treatment ranking results in previously published NMAs are presented alongside a novel method (the rank-heat plot)

What did the review find?

- NMA findings can be numerically summarized using 1) the mean or median treatment ranking, 2) the probability for each treatment in an NMA being the best (P(best)), or 3) the surface under the cumulative ranking (SUCRA) curve

- Graphical methods can be used to present the results for a single outcome (pie chart, rank chart, rankogram, stacked bar plot, bubble plot, SUCRA plot) or multiple outcomes (scatterplot, rank-heat plot)

- Some methods can only present P(best) or SUCRA values (rankogram, stacked bar plot, bubble plot, SUCRA plot), while others can present mean/median ranking as well (pie chart, rank chart, scatterplot, rank-heat plot)

- Compared to existing methods, the rank-heat plot has the advantage of being able to display the ranking of a large number of treatments; identifying treatments that have not been evaluated in particular outcomes; and displaying information for more than 3 outcomes in one figure