Comment on: 'Vitruvian plot: a visualisation tool for multiple outcomes in network meta-analysis'

Ostinelli *et al* developed an interesting visualisation tool, the Vitruvian plot, to present multiple outcomes in network meta-analysis.[1] We write to make some suggestions and potential improvements.

First, to present the strength of statistical evidence, the authors colour the sectors according to the p values of a Z-test. According to the Cochran handbook,[2] this could lead to over-reliance and misinterpretation of p values, and assertive judgements about imprecision. One solution is to use a partially contextualised approach, according to the guidance of the GRADE working group.[3] This approach also encourages researchers to use absolute values. After choosing reference intervention, researchers need to set thresholds for effects, which classify interventions into those with a trivial, small, moderate or large effect.[3] The specific magnitude of the potential benefit or harm is more conducive to helping readers understand the evidence accurately.

Second, in the Vitruvian plot, the increase in absolute event rate is in a 1:1 ratio with the increase in sector radius. Taking into account the general reader's understanding of statistics,[4] this could lead to misunderstandings. For example, if the radius is doubled, the area will be quadrupled. The sector area cannot accurately represent the corresponding absolute estimates. We suggest that the absolute event rate should be comparable to the ratio of shaded sectors to total sector area, which will avoid misunderstandings by graphically sensitive readers.

Third, the original Vitruvian plot cannot show both the specific magnitude of the potential benefit or harm and the certainty of evidence at the same time. Especially when we use effect size to colour the sector, the certainty of evidence could present information of imprecision.[3] We propose improvements to the Vitruvian plot to increase the presentation of the certainty of evidence. This facilitates the user to read the evidence coherently.

Based on the original design, we improved the original Vitruvian plot as shown in figure 1. The data presented in the figure are fictitious. For demonstration purposes, we set the same threshold for each outcome. The green and red in the sector represent the two directions of the effect. The ratio of the shaded sector area to the total sector area is consistent with the absolute event rate. The area outside the circle is used to present the certainty of evidence.

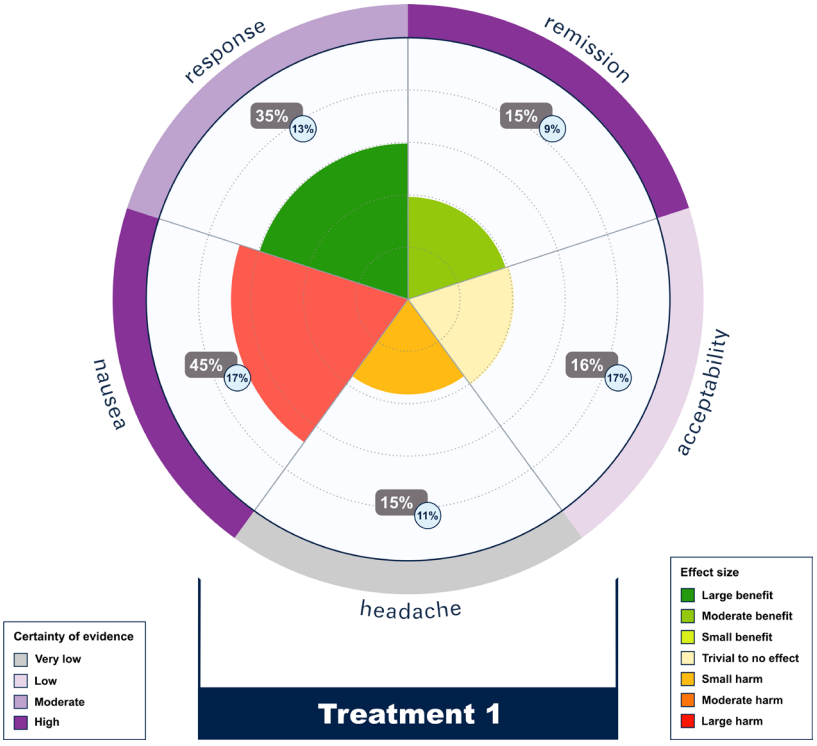

Figure 1 Improved Vitruvian plot.

We find the Vitruvian plot to be very useful and sincerely hope that our suggestions could refine this visualisation tool for multiple outcomes in network meta-analysis.

Honghao Lai,[1,2] Mingyao Sun,[3] Bei Pan,[4] Long Ge [1,2]

[1]Evidence-Based Social Science Research Center, School of Public Health, Lanzhou University, Lanzhou, China
[2]Department of Social Medicine and Health Management, School of Public Health, Lanzhou University, Lanzhou, China
[3]Evidence-Based Nursing Center, School of Nursing, Lanzhou University, Lanzhou, China
[4]Evidence-Based Medicine Center, School of Basic Medical Sciences, Lanzhou University, Lanzhou, China

Correspondence to Dr Long Ge, Evidence-Based Social Science Research Center, School of Public Health, Lanzhou University, Lanzhou 730000, Gansu, China; gelong2009@163.com

Contributors LG and BP conceived the idea. HL and MS designed and drawn the plot. HL wrote the first draft of the letter. LG and BP supervised the study. All authors critically revised the manuscript. HL is the guarantors. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests No, there are no competing interests.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; internally peer reviewed.

To cite Lai H, Sun M, Pan B, *et al*. *Evid Based Ment Health* 2022;**25**:e5.

Received 13 July 2022
Accepted 2 August 2022
Published Online First 25 August 2022

Evid Based Ment Health 2022;**25**:e5. doi:10.1136/ebmental-2022-300547

ORCID iD
Long Ge http://orcid.org/0000-0002-3555-1107

REFERENCES

1 Ostinelli EG, Efthimiou O, Naci H, *et al*. Vitruvian plot: a visualisation tool for multiple outcomes in network meta-analysis. *Evid Based Ment Health* 2022. doi:10.1136/ebmental-2022-300457. [Epub ahead of print: 25 May 2022].
2 Schünemann HJ, Vist GE, Higgins JPT. Chapter 15: Interpreting results and drawing conclusions. In: Higgins JPT, Thomas J, Chandler J, *et al*, eds. *Cochrane Handbook for systematic reviews of interventions version 6.3*. 2022. Cochrane, 2022. www.training.cochrane.org/handbook
3 Brignardello-Petersen R, Izcovich A, Rochwerg B, *et al*. Grade approach to drawing conclusions from a network meta-analysis using a partially contextualised framework. *BMJ* 2020;371:m3907.
4 Galesic M, Garcia-Retamero R. Statistical numeracy for health: a cross-cultural comparison with probabilistic national samples. *Arch Intern Med* 2010;170:462–8.