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Forrest plots or caterpillar plots?

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LETTERS TO THE EDITOR

Forrest plots or caterpillar plots?



The recent tutorial by Li et al. [1] is of great interest. They describe the multiple ways of using a forest plot to enhance the ability to make comparisons between data items. May I suggest one slight variation to this end? The caterpillar plot. The only difference with the forest plot is that for a caterpillar plot, the items (usually individual studies) are sorted in order of increasing effect size.

The effect of this sort in order of effect size is illustrated in Fig. 1. In this plot it is clear how each individual study effect size (in this case a bacteremia incidence) relates not only to the summary effect, but also to a central reference line. Moreover, the relationship of effect size and the degree of overlap of the caterpillar legs (the 95% confidence intervals of the studies) is more clearly apparent than is the case within a forest plot. This facilitates the visualization of heterogeneity “at a glance”.

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Bacteremia incidence
Antibiotic methods - control groups

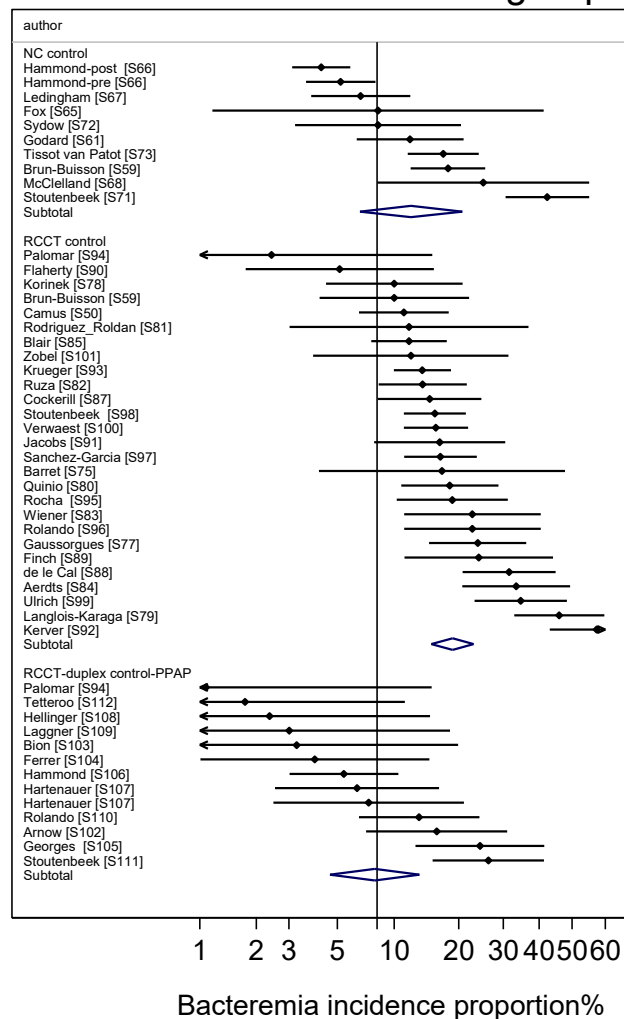


Fig. 1. Caterpillar plots of the group specific (small diamonds) and summary (large open diamond) bacteremia incidence per 100 patients and 95% CI of control groups from studies of VAP prevention. NC is nonconcurrent control. RCCT is randomized concurrent control. RCCT duplex study control groups received protocolized parenteral antibiotic prophylaxis (PPAP). For comparison, the summary bacteremia incidence (vertical line) derived from a set of 36 observational studies are shown. Note that the x axis is a logit scale. Details of data and derivation of figure provided in the study by Hurley [2]. This figure is adapted as in the study by Hurley [2] and used here under the terms of the Creative Commons Attribution 4.0. International License (<http://creativecommons.org/licenses/by/4.0/>).

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Conflict of interest: The author here declares that he has no conflicts of interest relevant to the material presented in this article to declare.

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Reply to letter to the editor “Forrest plots or caterpillar plots?”



Caterpillar plot—a slight modification to forest plot

We thank Dr Hurley’s comment [1] on our tutorial [2]. A caterpillar plot is essentially a slight modification to a forest plot, with the point estimates ordered by their magnitudes. We agree with Dr Hurley that sorting the point estimates could (1) aid in the easy visualization of heterogeneity for effect sizes among the included individual studies and (2) help readers with quick intake of the 95% confidence intervals of individual studies by presenting the caterpillar legs. This type of modification to a forest plot can be especially helpful when the number of included individual studies is large and when the focus is on investigation of the general pattern of point estimates among the included studies. Drawing caterpillar plots can be easily carried out because the codes or packages are readily available in some tools such as SAS, STATA, and R, to mention a few.

Nevertheless, caterpillar plots are not so popularly used as forest plots. Potential reasons include that (1) only point estimates can be ordered in caterpillar plots (i.e., we cannot sort the individual studies by year of publication or by authors’ last names to explore other patterns), (2) many meta-analytical researches use a forest plot aiming to make the individual point estimates and studies fully discernible, rather than assessing the pattern of point estimates across all the included studies, and (3) the software recommended by Cochrane collaboration (i.e., RevMan) cannot produce a caterpillar plot. These issues would therefore impair the possible applicability of caterpillar plots in the current literature. And it remains largely unknown about whether caterpillar plots can be widely accepted and applied in health research.

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A call for consensus guidelines on classification and reporting of methodological studies



We have read with great interest the recently published letters to the editor on methodological studies. The authors highlight important gaps with regard to the classification and reporting of methodological studies [1–3]. We agree that there is an urgent need for reporting guidelines in this field of research, and our group at McMaster University in Canada is currently working on developing guidance for these studies. This enterprise is registered on the EQUATOR network as the METHodological Review reportIng Checklist [4]. We have recently conducted a pilot study on a sample of methodological papers from 2017 and have identified many concerns, some of which were also raised in Dr. Puljak’s letter and related commentary (e.g., issues with classification, reporting of sampling methods, and search strategies) [5].

First, the nomenclature of such studies is not uniform. In the letters referenced previously, at least four appellations are used: research-on-research, meta-epidemiological studies, methodological studies, and meta-research. We have identified many more names attributed to methodological studies such as systematic review, systematic survey, literature survey, and so on [6–8]. The lack of uniform nomenclature makes it challenging to index and identify this group of studies.

Second, the fundamental design of methodological studies varies. While some investigators approach methodological studies as systematic reviews (e.g., with a comprehensive search and screen), others approach them as before–after studies, cross-sectional or longitudinal studies [9–11]. This has further implications for the sampling