

Importance of the distinction between quality of methodology and quality of reporting

The quality of a report of research and its methodological quality are two very different issues that should not be confused. The REMARK checklist is a list of essential elements that should be addressed in a report of a tumour marker prognostic factor study.¹ It is a reporting guideline. As we wrote “High-quality reporting of a study cannot transform a poorly designed or analysed study into a good one”. Further, in the REMARK explanatory paper we stated explicitly that “REMARK is not intended to dictate standards for the quality of research and it should not be used as such.”²

The recent review by Petrushnko et al³ inappropriately applied REMARK and likely led readers to the mistaken impression that REMARK provides metrics for assessment of the quality of a study. These authors wrote:

“The REMARK is a well-established scoring system for evaluating the quality and appropriateness of study design, methods and analysis of published biomarkers along with addressing their deficiencies ... The REMARK scoring system aims to identify articles who have conducted an adequate assessment of the reported biomarker.”

These statements reflect a serious misinterpretation. REMARK addresses only how well authors reported key aspects of their methods and the findings of their research. Good reporting helps readers to judge whether the study design and analysis and interpretation were sound. But good reporting is not a measure of methodological quality, so a “REMARK score” cannot validly be used in that way. A similar error has been seen with the reporting of observational studies.⁴

Petrushnko and colleagues went further and averaged the scores across multiple studies of each biomarker to provide a supposed measure of the strength of evidence, which is a separate concept from methodological quality and is something else that REMARK cannot validly inform. Based on this incorrect use of REMARK, their conclusions may be seriously wrong. Such errors can contribute flawed information to the medical evidence base and could promote suboptimal medical care for patients. Further, the authors make the same error when stating that they conducted their systematic review “according to PRISMA guidelines”. PRISMA is also a reporting guideline;⁵ it is not guidance on how to conduct a review.

We regret that none of the authors, peer reviewers or editors seems to be aware of the critical distinction between reporting quality and methodological quality. We hope that our letter brings clarity to this issue and can deter others from making similar errors in the future.

Reviews of published studies show that adherence to REMARK is well below an acceptable level. We encourage this journal to add adherence to REMARK as a requirement in the Instructions for authors

submitting papers about biomarkers and TRIPOD⁶ for multivariable risk prediction models. All research should be reported transparently and completely. Guidelines for reporting many types of research can be found on the website of the EQUATOR Network (www.equator-network.org).

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