

Beyond Tradition: Time to Reform Peer Review

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DOI: [10.35898/ghmj-831264](https://doi.org/10.35898/ghmj-831264)

ABSTRACT

Peer review is a cornerstone of research practice and scientific publishing, serving as a bridge between new proven science and presumably false scientific findings. However, the process often experiences delays, inconsistencies, biases, and deficiencies in the availability of qualified reviewers, so consequently fails to meet the needs of both the authors and the journals. This perspective outlines core challenges associated with peer review and proposes recommendations to enhance the efficacy of the process and improve the overall quality of reviews. Recommendations include providing different types of incentives to reviewers, developing a structured and guidelines-based reviewing system, and greater rigor over reviewer selection. Additionally, the incorporation of artificial intelligence now needs to be considered.

Keywords: Peer review; Guidelines; Artificial Intelligence; Journals; Open access.

Received: 20 July 2025

Reviewed: 29 July 2025

Revised: 02 September 2025

Accepted: 11 November 2025.

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Perspectives

Peer review is a process in which original papers are evaluated by reviewers to assess the scientific and technical quality of the paper (Ali & Watson, 2016). Although its roots can be traced back to the Royal Society in London as early as 1665, the modern form of the peer review system emerged in the mid-1970s (Ali & Watson, 2016; Walbot, 2009). The peer review process has received widespread support since it serves as a way to distinguish between new proven science and potentially erroneous scientific reporting. Despite its significance, there are several shortcomings surrounding this process that may compromise its integrity and cause potential delays in the submission process. To date, some publishers have implemented initiatives to establish a more structured and efficient peer review system; however, the desired outcomes have not yet been achieved (Candal-Pedreira et al., 2023). This perspective presents key challenges associated with the peer review process and suggests recommendations for improvement.

Peer review is often a lengthy, inconsistent, and sometimes unfair process that requires very competent individuals in their field of specialization to adequately evaluate a paper within their field. However, many of these individuals devote limited time and attention to the review process because of their personal and professional obligations, as well as contributing their time with no compensation. In turn, the publication and review process of a manuscript can be significantly disrupted, putting an additional burden on the authors, editors, journals, and publishers (Drozdz & Ladomery, 2024). Moreover, the peer review is inherently subjective. As a result, it is vital to appoint reviewers who have experience in relevant fields and are interested in the topic. Lack of interest in the subject or restricted availability of spare time may result in impaired judgment and poor decision making, potentially

overlooking the quality and novelty of the paper (Marcoci et al., 2022). Establishing a well-organized and structured peer review system will offer mutual benefits to all parties involved in this process (authors, reviewers, journals, publishers, and the broader scientific community).

A good reviewer should provide constructive feedback to the authors as well as the journal editor; where necessary, authors also benefit from reviewers' comments that show them how their paper can be improved. Where a paper is rejected, it is also helpful if the publisher is able to offer to transfer the manuscript, along with reviewers' comments, to another journal within the same publishing group.

A competent, objective, and equitable evaluation and review of research is a key obligation of publishing journals and a duty that editors owe to the scientific community and society. However, due to the vast amount of scientific manuscripts being written nowadays and the overwhelming need for a very large number of qualified reviewers, we need to take several steps in order to make the review process more effective and improve overall review quality (Hanson et al., 2024; Mosa et al., 2023). Some publishers have begun to adopt a more flexible system that offers incentives to reviewers, with the aim of encouraging greater participation in reviewing activities. Also, since most publishers charge the authors Article Processing Charges (APCs), a portion of these fees can be allocated to provide a symbolic cash reward to reviewers for each research paper reviewed.

In addition, the journals might establish a scoring system to provide scores to reviewers depending on the integrity and timeliness of their evaluation. Subsequently, based on these scores, the reviewers may be eligible for benefits, such as APC discounts and fast-track consideration for their submitted papers. Furthermore, publishers and journals should provide clear guidelines for reviewers by obligating them to respond to different questions regarding different aspects of the paper raised by the journal editor, and indicating whether each aspect is adequately discussed or not, and if not, whether improvements are possible and how the authors can make such improvements. This approach will encourage authors to submit more complete manuscripts, and reviewers will know what to critique and provide feedback on it (Drozdz & Ladomery, 2024).

Given current advancements, the integration of artificial intelligence (AI) into the peer review process represents a viable option. Research has shown the efficacy of AI in peer review and demonstrated good agreement between AI evaluations and human reviewers (Liang et al., 2024; Biswas et al., 2023). The AI can aid journal editors in assessing submitted manuscripts prior to peer review by determining eligibility for review, adherence to journal and reporting standards, and identifying data fabrication. It can also assist in alleviating biases associated with authors and their affiliations (Bauchner & Rivara, 2024; Nashwan & Ahmed, 2025).

In summary, while peer review is an essential component of scientific practice, it faces challenges that interfere with its efficiency and fairness, which must be addressed. Bias, subjectivity, and limited time availability cause delays and inconsistencies. The peer review process needs to be thoroughly examined to achieve optimal effectiveness. Improving this process will lead to better outcomes for all parties involved in this process.

Conflict of Interest

There is no conflict of interest.

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Cite this article as:

Mosa, A. A., Haji, J. R., & Mohammad, A. M. (2025). Beyond Tradition: Time to Reform Peer Review. *GHMJ (Global Health Management Journal)*, 8(3), 412–414. <https://doi.org/10.35898/ghmj-831264>