

pone.0023477

- 5 Smith R. Let's simply scrap authorship and move to contributorship. *BMJ* 2012;344:e157. doi: 10.1136/bmj.e157
- 6 Gasparyan AY. Authorship and contributorship in scholarly journals. *European Science Editing* 2012;38(3):58-59.
- 7 Bosch X, Pericas JM, Hernández C, Torrents A. A comparison of authorship policies at top-ranked peer-reviewed biomedical journals. *Archives of Internal Medicine* 2012;172(1):70-72. doi: 10.1001/archinternmed.2011.600
- 8 Tao KM, Li XQ, Zhou QH, Moher D, Ling CQ, Yu WF. From QUOROM to PRISMA: a survey of high-impact medical journals' instructions to authors and a review of systematic reviews in anesthesia literature. *PLoS One* 2011;6(11):e27611. doi: 10.1371/journal.pone.0027611
- 9 International Committee of Medical Journal Editors I. Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Ethical Considerations in the Conduct and Reporting of Research: Authorship and Contributorship. 2009. Available at http://www.icmje.org/urm_full.pdf (accessed 18 November 2012).
- 10 Matheson A. How industry uses the ICMJE guidelines to manipulate authorship—and how they should be revised. *PLoS Medicine* 2011;8(8):e1001072. doi: 10.1371/journal.pmed.1001072
- 11 Shaw D. The ICMJE's definition of authorship is illogical and unethical. *BMJ* 2011;343:d7192. doi: 10.1136/bmj.d7192.
- 12 Alves D, Arkani-Hamed N, Arora S, Bai Y, Baumgart M, et al Simplified models for LHC new physics searches. *Journal of Physics G: Nuclear and Particle Physics* 2012;39(10):105005. doi: 10.1088/0954-3899/39/10/105005
- 13 [No authors listed] An international randomized trial comparing four thrombolytic strategies for acute myocardial infarction. The GUSTO Investigators. *The New England Journal of Medicine* 1993;329(10):673-682. doi: 10.1056/NEJM199309023291001
- 14 Huth EJ. Guidelines on authorship of medical papers. *Annals of Internal Medicine* 1986;104(2):269-274.
- 15 Baskin PK, Gross RA. Honorary and ghost authorship. *BMJ* 2011;343:d6223. doi: 10.1136/bmj.d6223.
- 16 Horton R. The hidden research paper. *JAMA* 2002;287(21):2775-8. doi: 10.1001/jama.287.21.2775
- 17 Bosch X, Ross JS. Ghostwriting: research misconduct, plagiarism, or fool's gold? *The American Journal of Medicine* 2012;125(4):324-326. doi: 10.1016/j.amjmed.2011.07.015
- 18 Ross JS, Hill KP, Egilman DS, Krumholz HM. Guest authorship and ghostwriting in publications related to rofecoxib: a case study of industry documents from rofecoxib litigation. *JAMA* 2008;299(15):1800-1812. doi: 10.1001/jama.299.15.1800
- 19 Bosch X, Esfandiari B, McHenry L. Challenging medical ghostwriting in US courts. *PLoS Medicine* 2012;9(1):e1001163. doi: 10.1371/journal.pmed.1001163
- 20 Wislar JS, Flanagan A, Fontanarosa PB, Deangelis CD. Honorary and ghost authorship in high impact biomedical journals: a cross sectional survey. *BMJ* 2011;343:d6128. doi: 10.1136/bmj.d6128.
- 21 Bonekamp S, Halappa VG, Corona-Villalobos CP, Mensa M, Eng J, Lewin JS, Kamel IR. Prevalence of honorary coauthorship in the American Journal of Roentgenology. *American Journal of Roentgenology* 2012;198(6):1247-1255. doi: 10.2214/AJR.11.8253
- 22 Fang FC, Steen RG, Casadevall A. Misconduct accounts for the majority of retracted scientific publications. *Proceedings of the National Academy of Sciences of the United States of America* 2012;109(42):17028-17033. doi: 10.1073/pnas.1212247109

Criticism of peer review and ways to improve it

Hasan Shareef Ahmed

Research and Evaluation Division, BRAC, Dhaka, Bangladesh; shareef.ha@brac.net

Armen Yuri Gasparyan

Departments of Rheumatology and Research and Development, Dudley Group NHS Foundation Trust (A Teaching Trust of the University of Birmingham, UK), Russells Hall Hospital, Dudley, West Midlands, UK; a.gasparyan@gmail.com

Abstract This paper reviews some critical aspects of peer review in developed and developing countries. Though the peer review process is criticised for some of its drawbacks, it is still widely accepted as a tool for preserving the integrity and quality of scholarly communication. Peer review varies widely across journals and countries. Many developing and some developed countries suffer from substandard and biased peer review mainly due to the lack of training in peer review. The peer review process is still slow, expensive, poor in detecting scientific misconduct, and open to abuse. It needs reforming to make it more effective worldwide.

Keywords Peer review; science communication; developing countries.

Introduction

Peer review is essential for quality control in scholarly communication. It has been used as a tool to uphold publishing standards for more than two centuries,¹ and is now based on solid empirical experience of numerous generations of science editors.² Unfortunately, standards of peer review vary across journals within and between developed and developing countries. Though its importance has been appreciated by most editors, the perception of its aims varies widely, and not all of them rely on fair, unbiased and truly scientific principles of peer review.³ Some view the process of analysing and commenting on journal submissions as a tool to disseminate best quality research data.⁴ Indeed, the primary aim of peer review is to select and disseminate valid and credible scientific research reports. This is why peer reviewers are often credited as gatekeepers of scientific communication, filtering out low quality and poorly readable contents.⁵ Unsurprisingly, the modern-day international scientific community values peer-reviewed literature and discourages publishing in non-peer-reviewed journals.⁶

Criticism of peer review

Peer review did not develop overnight. Publishers and editors from all over the world used it differently in the past decades, gradually improving some of its components, but unable to propose a perfect system of scientific quality control.⁷ One of the main opponents of the modern-day peer review, the former chief editor of *BMJ*, Richard Smith, finds

it difficult to scientifically define this process and qualify scholars involved in it as “peers”.⁸ His criticism relates to the facts that it is “a flawed process” operating in the absence of hard evidence of its effectiveness.⁷ He also refers to its expensiveness, unfairness towards unconventional, ground-breaking research, proneness to abuse, and failure to detect scientific misconduct.⁹ Many science editors strongly believe that peer review is imperfect and full of mistakes, but did not propose any better alternative.¹⁰ Instead, given the potential of the peer review to improve the quality of publications, some editors provide guidance for reviewers over the issues of writing and adhering to the principles of ethical research reporting.¹¹⁻¹⁴ Moreover, it is suggested that criteria for selecting experts with advanced reviewer skills to contribute to the effectiveness of the peer review be set.¹⁵

Apparently, editors should invite experts willing to contribute to the target journal as reviewers, who have up-to-date knowledge and skills in the subject area as well as in statistics, science writing and reporting.¹⁵ But it is difficult to find such people within one’s reach. The same criteria are applicable in both developed and developing countries, as modern science does not recognise national boundaries.

Why is peer review ineffective?

Peer review does not function properly primarily because of the huge, ever-growing number of journal submissions and publications. An estimated 1,350,000 papers were published in 23,750 journals in 2006.¹⁶ Obviously, such an unprecedented growth of publications can cause shortages of competent and available reviewers globally, and chances are high that some substandard papers will be published.

Another critical factor is that most reviewers are often not properly acknowledged and given incentives both academically and financially.¹⁷ Financial incentives and awards may work well both in developing and developed countries.

Interestingly, the reviewers’ efforts are often not appreciated by either publishers or the authors, whose research reports are critically analysed and corrected as a result of the high quality peer review.¹⁸ Finally, the quality of the peer review can be jeopardised because of its use without considering the issues of scientific infrastructure and culture.¹⁹

Blinding peer review

Masking reviewers’ and authors’ identities may limit some bias from the peer review process. Strong evidence supporting any of these models of peer review is missing. Based on empirical experience and experts’ opinion, journals from across the globe employ different models of peer review: single-, double-blind, or open. Several initial reports suggested that the majority of authors and reviewers prefer masking the reviewers’ identity.²⁰ Nonetheless, some editors of top-ranking journals, particularly the *BMJ*, pioneered implementation of an open model in 1999, aiming to ensure transparency and to increase reviewers’ accountability, the quality of their signed (open) comments, and the overall fairness of peer review.²¹ A large randomised study,

however, did not find any effect of this model on the quality of reviewers’ comments within *BMJ*.²² A similar study on a Danish general medical journal reiterated that unmasking reviewers’ identity does not provide benefits in terms of quality, and it may even decrease the number of reviewers wishing to comment and disclose their identity to authors.²³ Obviously, anonymity is essential for criticising without fear of exposing reviewers’ identity to their colleagues. This is why single- or double-blind models are still more preferable for small, professional communities, particularly for those from developing countries.

Peer review and growth of science in developing countries

Despite its shortcomings, peer review remains central to prepublication quality control.²⁴ As a “service to the profession”, it has some unmeasurable positive implications for authors and reviewers, who learn from more experienced professionals through peer review. Authors with extensive publishing experience would agree that constructive peer review and related revisions are instrumental in the dissemination of clear scientific results presented in a polished academic language. Those who publish original research papers would agree that input from a statistical reviewer is required for more accurate research reporting.¹⁵

In an attempt to succeed in the global competition, many developing countries allocate a reasonable amount of money to the publishing market, but fail to implement peer review and to get their scholarly journals indexed by prestigious databases.²⁵ There are many reasons for poor research performance in developing countries, including the language barrier, lack of training in science writing, difficulties in communicating with advanced specialists from mainstream science countries, and widespread scientific misconduct.²⁶⁻²⁸ Nonetheless, some countries, particularly Iran, overcame some of these obstacles in scholarly communication, increased the number of indexed journals and succeeded in publishing citable papers in the past decades.²⁹ Impressive are also the achievements in China, where peer review is obligatory and more than 5000 peer-reviewed journals are currently published. Most of these journals employ the three-level system: preliminary review by journal editors, evaluation by peers, and finally by the chief editor.³⁰

How to improve peer review

To improve the quality of peer review, one should define its objectives and formulate the tasks of the reviewers. Reviewers should be sufficiently skilled to identify scientific misconduct.²⁷ Editors may substantially shorten peer review time by selecting the best performing reviewers.¹⁵ But in reality, not all journals always have enough reviewers to choose from. In countries where peer review is still poorly developed, academic institutions should arrange training courses for researchers and editors involved in journal publishing. Ideally, such courses should be conducted by experts with experience of reviewing for top-ranking journals.

Would paid peer review improve its outcomes? *BMJ*, *The Lancet* and some other journals have used the system of financial rewards for reviewers, but there has been no study favouring such an approach. Besides, paid peer review is not feasible for most journals from across the globe owing to budget constraints. Perhaps more feasible and scientifically justifiable is to implement academic credit for quality comments, give a free subscription to the concerned journal, and publicise the names of the best reviewers on a regular basis. However, peer review needs some kind of reform to make it more effective worldwide. Further in-depth studies both in developed and developing countries may be helpful to this end.

References

- 1 Kronick DA. Peer-review in 18th-century scientific journalism. *JAMA* 1990;263(10):1321-1322. doi:10.1001/jama.1990.03440100021002
- 2 Jefferson T, Rudin M, Brodney Folse S, Davidoff F. Editorial peer review for improving the quality of reports of biomedical studies. *Cochrane Database of Systematic Reviews* 2007;(2):MR000016. doi: 10.1002/14651858.MR000016.pub3
- 3 Smith R. The trouble with medical journals. *Journal of the Royal Society of Medicine* 2006;99(3):115-119.
- 4 Bornmann L, Mungra P. Improving peer review in scholarly journals. *European Science Editing* 2011;37(2):41-43.
- 5 Shashok K. Content and communication: how can peer review provide helpful feedback about the writing? *BMC Medical Research Methodology* 2008;8:3. doi: 10.1186/1471-2288-8-3
- 6 Garmel GM. Reviewing manuscripts for biomedical journals. *The Permanente Journal* 2010;14(1):32-40.
- 7 Benos DJ, Bashari E, Chaves JM, Gaggari A, Kapoor N, LaFrance M, Mans R, Mayhew D, McGowan S, Polter A, Qadri Y, Sarfare S, Schultz K, Splittgerber R, Stephenson J, Tower C, Walton RG, Zotov A. The ups and downs of peer review. *Advances in Physiology Education* 2007;31(2):145-152. doi: 10.1152/advan.00104.2006
- 8 Smith R. Peer review: a flawed process at the heart of science and journals. *Journal of the Royal Society of Medicine* 2006;99(4):178-182.
- 9 Smith R. Classical peer review: an empty gun. *Breast Cancer Research* 2010;12 Suppl 4:S13. doi: 10.1186/bcr2742
- 10 Habibzadeh F. Judge the article, not the author. *Croatian Medical Journal* 2010;51(4):357-358. doi: 10.3325/cmj.2010.51.357
- 11 Gasparyan AY, Ayvazyan L, Blackmore H, Kitas GD. Writing a narrative biomedical review: considerations for authors, peer reviewers, and editors. *Rheumatology International* 2011;31(11):1409-1417. doi: 10.1007/s00296-011-1999-3
- 12 Gasparyan AY, Ayvazyan L, Kitas GD. Authorship problems in scholarly journals: considerations for authors, peer reviewers and editors. *Rheumatology International* 2012 [Epub ahead of print]. doi: 10.1007/s00296-012-2582-2
- 13 Bosetti F, Toscano CD. Is it time to standardize ethics guiding the peer review process? *Lipids* 2008;43(2):107-108. doi: 10.1007/s11745-007-3134-5
- 14 Lovejoy TI, Revenson TA, France CR. Reviewing manuscripts for peer-review journals: a primer for novice and seasoned reviewers. *Annals of Behavioral Medicine* 2011;42(1):1-13. doi: 10.1007/s12160-011-9269-x
- 15 Gasparyan AY, Kitas GD. Best peer reviewers and the quality of peer review in biomedical journals. *Croatian Medical Journal* 2012;53(4):386-389. doi: 10.3325/cmj.2012.53.386
- 16 Björk B-C, Roos A, Lauri M. Scientific journal publishing: yearly volume and open access availability. *Information Research* 2009;14(1):paper 391. Available at <http://informationr.net/ir/14-1/paper391.html> [accessed 6 December 2012].
- 17 Choi BC. Incentives to encourage peer review. *Journal of Postgraduate Medicine* 2006;52(4):325.
- 18 Weber EJ, Katz PP, Waeckerle JF, Callahan ML. Author perception of peer review: impact of review quality and acceptance on satisfaction. *JAMA* 2002;287(21):2790-2793. doi: 10.1001/jama.287.21.2790
- 19 Jawaid SA. Problems faced by editors of peer reviewed medical journals. *Saudi Medical Journal* 2004;25(1 Suppl):S21-5.
- 20 Fabiato A. Anonymity of reviewers. *Cardiovascular Research* 1994;28(8):1134-1139. doi: 10.1093/cvr/28.8.1134
- 21 Groves T. Is open peer review the fairest system? Yes. *BMJ* 2010;341:c6424. doi: 10.1136/bmj.c6424
- 22 van Rooyen S, Delamothe T, Evans SJ. Effect on peer review of telling reviewers that their signed reviews might be posted on the web: randomised controlled trial. *BMJ* 2010;341:c5729. doi: 10.1136/bmj.c5729
- 23 Vinther S, Nielsen OH, Rosenberg J, Keiding N, Schroeder TV. Same review quality in open versus blinded peer review in "Ugeskrift for Læger". *Danish Medical Journal* 2012;59(8):A4479.
- 24 Gasparyan AY. Peer review in scholarly biomedical journals: a few things that make a big difference. *European Science Editing* 2012;38(2):30-31.
- 25 Ahmed HS. Current status of scientific journals published in Bangladesh. *Journal of Scholarly Publishing* 1998;30(1):38-46.
- 26 Islam M. Academic publishing and the university presses: the case in a developing region (Saudi Arabia). *The Essential JSP: Critical Insights into the World of Scholarly Publishing – Vol. 2: Scholarly Publishing Emerging nations* 2012;2:224-32.
- 27 Saidi F. The dual role of peer-review systems in developing countries. *Archive of Iranian Medicine* 2007;10(4):519-521.
- 28 Ahmed HS. Scientific editing and scholarly publishing in Bangladesh: a personal journey. *European Science Editing* 2012;38(2):42-43.
- 29 Kharabaf S, Abdollahi M. Science growth in Iran over the past 35 years. *Journal of Research in Medical Sciences* 2012;17(3):275-279.
- 30 Qing F, Lifang X, Xiaochuan L. Peer-review practice and research for academic journals in China. *The Essential JSP: Critical Insights into the World of Scholarly Publishing – Vol. 2: Scholarly Publishing Emerging nations* 2012;2:146-55.