

Peer review under scrutiny

The practice of seeking an expert's comments on submitted articles is as old as *Philosophical Transactions of the Royal Society* and is the central mechanism for assessment of the quality of manuscripts before publication in scientific journals. In recent years, a number of editorials and articles have addressed various issues related to the process of peer reviewing, reflecting the increasing interest on the subject¹⁻⁷. Six years ago, thanks to the efforts of the editors of some of the leading medical journals, a conference on peer review was held in Chicago, Illinois⁸. The meeting focused attention on problems connected with manuscript assessment and helped to stimulate research into relevant aspects of peer review.

A second international congress on peer review in biomedical publications was held in Chicago, Illinois, in September 1993 and brought together editors and researchers from 20 different countries. *The Journal of the American Medical Association (JAMA)* has devoted one of its recent issues to publishing 26 articles selected from 110 papers presented during the conference⁹.

The published papers discuss several interesting aspects such as effectiveness of peer review as a quality control mechanism, role of blinded reviews, author's views on editorial practices and cognitive aspects of manuscript assessment.

M. Abbey, M. D. Massey, S. Galandiuk and H. C. Polk (*The American Journal of Surgery*) determined what percentage of manuscripts rejected by their journal were subsequently published in other journals indexed by MEDLINE. They found that 62% of the manuscripts rejected by them remained unpublished in core medical journals. More than half of the articles, ultimately published, appeared in journals

with a lower circulation rate. Their findings imply that review process effectively prevents publication of manuscripts of a lower quality.

The effect of peer review and editorial processes on the readability of articles has been measured by J. C. Roberts, R. H. Fletcher and S. W. Fletcher (*Annals of Internal Medicine*). Editorial practices were found to improve the readability of the articles as measured by indices such as the Gunning fog index and the Flesch reading ease score. Readers, mostly practising physicians, however did not agree with the peer assessment with respect to the importance of published articles. Articles which received high marks for importance were often judged as less relevant to clinical practice. This difference in opinion may be because the reviewers recommend articles containing new information and the clinicians are reluctant to accept unestablished findings.

Peer review is thought to be a good defence against scientific misconduct. Yet, numerous articles with fabricated or plagiarized or redundant (duplicate) data get published despite peer review. H. N. Nigg and G. Redulescu (*Bulletin of Environmental Contamination and Toxicology*) report four cases of misconduct encountered in their journal since 1990. In three cases, the authors belonged to institutions in India.

P. A. Rochar *et al.* of Mount Sinai Hospital confirm our suspicion that scientific articles published in journal supplements are generally of inferior quality when compared with those published in the parent journal. Their finding is based on assessment by blinded reviewers of the quality of articles on randomized control trials of drug therapies published in *American Journal of Cardiology*, *American Journal of Medicine* and *American Heart Journal*.

What is the impact of blinded peer review? D. N. Laband and M. J. Piette from the Department of Economics, Auburn University, drew a sample of 1051 articles in 28 economics journals published during 1984 and found that articles in journals using nonblinded peer review received lesser number of citations than those in journals using blinded peer review. Journals using nonblinded review appear to publish a large number of papers that should not have been published.

The basis for recommending blinded reviews is that many researchers have the apprehension that reviewers recommend and editors accept articles that originate from prestigious or better-known institutions and those submitted by authors who have more previous publications. J. M. Garfunkel and colleagues (*Journal of Paediatrics*) found in their analysis that there is no difference in the acceptance rate of major manuscripts from institutions of greater prestige and from other institutions. However, a significant correlation existed between institutional rank and recommendations or decisions to accept case reports and brief reports. M. Fisher, S. B. Friedman and B. Strauss (*Journal of Developmental and Behavioural Paediatrics*) also concluded from a randomized controlled trial that there was no significant difference in the scoring of manuscripts and recommendations when reviewers were either blinded or nonblinded to the previous publication record of the author.

Another form of bias suspected in handling of manuscripts is gender bias. J. R. Gilbert, E. S. Williams and D. G. Lundberg (*JAMA*) assessed whether the manuscripts received by the journal had different manuscript processing characteristics associated with the gender of the corresponding author, editor and reviewer. Participants in this retrospective cohort

study included 8 male and 5 female editors, 2452 male and 930 female reviewers and 1698 male and 462 female authors. Interestingly, the study revealed that gender differences exist in editor and reviewer characteristics. Female editors summarily rejected manuscripts at a higher rate than male editors ($p < 0.001!$). Male editors utilized male reviewers more often than female reviewers, while female editors used reviewers of both genders at equal rates. Female editors were assigned manuscripts with female corresponding authors at a higher rate. Male reviewers took significantly longer time to return the manuscripts than female reviewers. Gender of the reviewers and corresponding authors had no association with the recommendation made by the reviewers. There was no evidence of gender bias in the final acceptance rate of manuscripts.

M. Nylenna, P. Riis and Y. Karlsson (*Journal of Norwegian Medical Association*) studied the association between the characteristics of referees and their assessment of manuscripts, and also the influence of manuscript language. Experienced and young referees were found to provide better reviews than their older colleagues. In Scandinavian countries, an English version of a manuscript was more easily accepted than its national version, and the submission of an article in mother tongue appeared to be a handicap.

How do authors view editorial practices? The subject has been investigated by B. J. Sweitzer and D. J. Cullen (*Journal of Clinical Anaesthesia*). They ascertained from authors of unsolicited articles their views on the evaluation of their manuscripts. Opinion was sought on timeliness, quality, clarity, specificity and educational value of reviewer's comments as well as their satisfaction or dissatisfaction (because of delay, unclear comments, overlooking important data, tone of the review, lack of knowledge of the reviewer, etc.) with the reviews. Authors of accepted manuscripts gave a favourable rating for reviewers. Authors of articles in the category of 'accept with revision' were satisfied that the review process led to improvement in their manuscripts. Authors of articles in 'reject but resubmit' category believed that the review process improved subsequent preparation of manuscripts. Worst scores were provided by authors of 'reject outright' articles. Only 30% in this group responded and

among them only 20% believed that they were helped by the review process.

Can the nature of manuscript assessment be improved to help editors in decision making? Editors often encounter situations when reviewers do not agree in their recommendations on a manuscript. On such occasions editors either use an arbitrary cut-off score to determine acceptance or use their discretion. Editors would be helped if the reviewers provide a structured assessment and there are objective criteria to measure the reliability and quality of reviews.

J. P. Kassirer and E. W. Campion (*New England Journal of Medicine*) in their paper discuss the cognitive aspects of manuscript assessment. They try to blunt the criticism that there are no rules governing peer review and that the process is arbitrary and subjective. They point out that the fundamental task of a manuscript reviewer is to 'detect and describe flaws' and that in the assessment of manuscripts there is a rejection threshold – a level at which the cumulative faults of a paper turn the scales towards rejection. Manuscript assessment also has a sensitivity and specificity. Wrong recommendations are unavoidable in the review process since even in the best of hands false positive and false negative results do occur. If this state has to change, the cognitive aspects of how a reviewer makes an assessment of manuscripts have to be better understood. J. P. Kassirer and E. W. Campion (*New England Journal of Medicine*) have categorized and listed the various aspects of a manuscript on which a reviewer is expected to comment. The categories include deficiencies of design, deficiencies in presentation, deficiencies in interpretation and assessment about the importance of research. Under each category flaws are listed. The list makes the reviewers' job in making objective assessment on articles easy.

M. K. Cho and L. A. Bero from the Institute for Health Policy Studies, California, have developed two instruments, one for measuring the methodologic quality and another to assess the clinical relevance of reports on clinical research. Both have been tested and found reliable, valid and applicable to a variety of research designs.

A grading instrument with a 14-point scoring system and a scoring guide to measure objectively the quality of reviews

is provided by I. D. Feurer *et al.* (*Journal of Vascular Interventional Radiology*). The seven attributes in the system include timeliness, etiquette, completion of a grade sheet, and provision of (i) sectional reviews, (ii) supporting references, (iii) specific recommendations and (iv) new insights or perspectives. The authors have tested the scoring system and found it valuable to identify outstanding and weak reviewers.

Authors' misconduct receives considerable publicity while editorial misdeeds are unpublished. Dishonesty, favouritism, victimization and nondeclaration of conflict of interest are recognized as some of the unethical editorial practices. The true prevalence of editorial misdemeanour is unknown. D. G. Altman, I. Chalmers and A. Herxheimer from Oxford, England, draw attention to three cases of editorial misdeeds. One case is that the editor republished an article which appeared in another journal without consulting the author and then attacked it in an editorial, refusing a chance for the author to reply. Another case involved plagiarism of a commissioned review article. The third is an instance of not disclosing the editor's vested interest, which led to unfair assessment of a manuscript describing a randomized controlled drug trial. Altman and colleagues suggest that an International Medical Scientific Press Council be established to set a code of conduct for editors and to investigate when there is breach of prescribed conduct.

Journal publishers are concerned with the way in which authors select the journals for submission of their articles. Eric Frank from Emory University School of Medicine conducted a survey among the clinical and research faculty of Stanford University School of Medicine to evaluate authors' criteria. The most important factors for initial manuscript submission were journal prestige, the frequency with which a journal publishes related articles and the composition of the readership. Likelihood of acceptance, turn-around time, prior publication in a journal and acquaintance with the editor gained importance for subsequent submissions.

H. F. Judson of Stanford University draws attention to factors that threaten the peer review process. He writes: 'What was a high and interesting duty has become a wearisome chore'. Waning dedication and enthusiasm of the participants in the peer review process are likely to

lead to declining standards. He also cautions that peer review, which began as a measure to shield the autonomy of science from administrators and politicians, is threatened by internal politics such as rivalries between scientists and the likelihood of theft of ideas and insights by peer reviewers, who are often competitors of the authors of articles. Judson predicts that structural transformation in sciences would have its impact on peer review processes. Shortage of funds for research, intensification of competition, increasing pressure from funding agencies for research targeted at national needs, with emphasis on industrial and technological exploitation of research, are characteristics of the current transition. Profit motives determine the direction of research. Criteria for the evaluation of a research work are determined by non-scientists and the emphasis is on outcome

and endpoints than on inputs. Yet another transformation is the development of electronic collaboration, which offers considerable options for interaction between editors, authors and readers. New procedures for manuscript assessment are expected to replace the current practices.

What did the participants feel after the congress? Attitude survey conducted after the conference revealed that a vast majority of respondents thought that peer review improves the quality of publication, that the journals should adopt uniform standards for peer review and that the editors should encourage research to establish baseline data on the prevalence of scientific fraud. Among the respondents, 95% said that conferences on editorial peer review should be held regularly in the future.

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What NSU report leaves unanswered!

This refers to the Special Section of *Current Science* (25 June) in which you have closed the debate on NSU. To me it appears that the debate has been ineffective and inconclusive. I was surprised and somewhat disappointed to note that you have not summarized in clear terms, with reasonable details, what your authors and readers have generally opined about the new university. In your 'In this issue' column, there appears a remark 'there were few supporters of the NSU concept'. I just wonder if the term *few* is actually intended to mean *some* (equivalent to *a few*) or to imply *hardly any* (which it really does)! In the latter case, your authors' and readers' message is rather clear.

There are a few important questions that have been left unaddressed in the final report. Supporters of NSU and those actively engaged in its establishment should feel obliged to give serious thought to these. Some of them are:

1. NSU will be producing some 200 Ph D's every year. Where would they be

expected to go? Would they accept to work in other Indian universities/colleges whose academic environment would hardly match that of the said university?

2. Will the phenomenon of brain-drain not apply to the trained scientists coming out of NSU? Will they be allowed to go abroad, since in a free and democratic country nobody can be stopped from searching for a better working place? Will we allow brain-drain, giving the argument that science is universal and that complete mobility must be granted to scientists so that they could work in a place of their liking? But then we have to remember that there are moments when we become specially conscious of our nationalism and start talking of things like Indian science.

3. The report states that NSU would also train foreign students. Why spend the available resources on foreign students? Why not train more and more Indian students? After all, the university would hardly be able to cater to the academic needs of our vast population. That means we would be obliged to

concentrate our efforts fully on training as many Indians as possible.

I have a suggestion to make. All those who are involved in erecting NSU - a temple of academic excellence - should avoid accepting a faculty chair or any other position of importance on the completion of the task. In the end, they should hand over the institution to deserving people from within the country and from outside. This will reinforce the faith reposed on them by the general public and will also succeed in impressing upon the skeptics that NSU was not being created in their own interests but in the interest of the nation. Let us remember that great men, whose actions are motivated by a deep-rooted concern about the welfare of the society, gracefully leave a completed project to others to look after and move on to a newer venture.

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