

ARTICLE

Improving Reporting Standards in Biomedical Journals

by Jason Roberts, PhD
Managing Editor, Headache
Past-President, ISMTE
journal@absnet.org

In this first of two articles Jason Roberts examines the problem of poor reporting in biomedical journals, how it undermines otherwise good research, and what solutions are emerging to tackle this problem. The article concludes by addressing why editorial offices need to be a part of the solution. In next month's issue of EON, a second article will examine how editorial offices can institute reporting guidelines to encourage authors to raise standards.

What Are Poor Reporting Standards?

In recent years there have been very vocal campaigns to ensure authors include full disclosure statements with their submissions

alongside calls for journals to promote ethical practices in publishing. As the publishing industry continues to strive towards greater transparency in peer review, coupled with increasingly competitive markets that force journals to constantly raise standards, a new movement is coalescing to improve reporting practices.¹ The origins of this growing debate can be traced to health science journals, but increasingly all scientific fields are examining the problem, specific to their own contexts.

Research published since the mid-1990s suggests poor reporting (though not necessarily poorly conducted research) is prevalent.² The problem is not just contained to

1 Simera I, Moher D, Hirst A, Hoey J, Schultz KF, Altman DG. Transparent and accurate reporting increases reliability, utility and impact of your research: reporting guidelines and the

EQUATOR Network. *BMC Medicine* 2010; 8:24

2 Altman DG. The scandal of poor medical research. *BMJ* 1994; 308:283-284

In this issue:

Articles

- *Improving Reporting Standards in Biomedical Journals* **1**
- *Camping Out at EMUG* **5**

Columns

- *Tips & Tricks* **7**
- *Taming Technology* **9**
- *Portrait of an Editorial Office* **11**

Miscellaneous

- *Calendar* **16**

Improving Reporting Standards

continued

submissions under review. Retrospective studies of published material frequently reveal reviewers did not pick up reporting problems – this is perhaps inevitable as reviewers are also authors and the common errors are simply perpetuated.³

What constitutes poor reporting? Typically the problem is focused upon results that are undermined by omissions, inaccuracies, or ineffectual descriptions of research methodologies. This creates a major problem: It becomes difficult to replicate a study (a critical defect if the research ideas presented are ever to be expanded). Of equal importance, it is often impossible to discern how the results were obtained. For many readers this may weaken their confidence in the quality of the data and results presented. It may even lead them to question the veracity of the data. Additionally, poor reporting may obscure errors, biases, and other influences. As Loder and Penzien note:

Good reports should contain a clear explanation of the study methods, describe statistical techniques in enough detail to allow verification of the results from original data, report all results, and interpret and present findings in a balanced and forthright way.⁴

Is this important? Clearly the *British Medical Journal (BMJ)* thinks so. A review of the initial triage of manuscripts at the *BMJ* by Elise Langdon-Neuner revealed all manuscripts were subjected to a methodological review to determine if the manuscript was worthy of full peer review. As part of an upcoming research project on reporting standards, the *Headache* editorial office (the managing editor and

statistical consultant) determined that 79% of all rejections at *Headache* contained either a major or minor methodological concern. The most typical concerns include poor descriptions of research plans and the omission of crucial data alongside explanations of how it was obtained.

The rapid expansion in published research means the sheer volume of poorly reported material is likely to be massive. This fact generates significant consequences. For example, prescribing behaviors may be erroneously influenced. Alternatively, research projects may set off in the wrong direction based on faulty methodological descriptions. Very real concerns exist that standards are weakest at small or regional journals, yet these publications constitute part of the corpus of peer-reviewed literature. The published results are then picked up in major review articles and meta-analyses (a phenomenon termed *evidence upgrade*) and suddenly flawed reports are featured in practice-influencing articles. A common problem, admittedly caused by the additional issue of poor analytical practice in writing review articles, is that data from several studies are often pooled together. Incorrect inferences are then drawn because there may be significant differences in how data are collected between studies. This problem could be avoided if each study had described fully the method of data collection.

Weak reporting standards, it should be noted, are not just restricted to unsophisticated or inexperienced authors. It appears most authors are prone to making fundamentally simple, and correctable if spotted, errors. How do we know this? By looking at the evidence generated by the

³ Altman DG. Poor-quality medical research: what can journals do? *JAMA* 2002; 287 (21):2765-2767.

⁴ Loder EW, Penzien DB. Improving the quality of research reporting: *Headache* steps up to the plate. *Headache* 2009; 49:3, 335-340

Improving Reporting Standards

continued

emerging solution to this problem.

Reporting Guidelines – A Solution

Starting with the development of the CONSORT (Consolidated Standards of Reporting Trials) Statement in 1996, more than 100 reporting guidelines have been developed to fit every type of manuscript ranging from Randomized Controlled Trials to Observational Epidemiological Studies. What are reporting guidelines? Typically developed by a group of methodological experts in certain fields they are:

[S]tatements that provide advice on how to report research methods and findings. Usually in the form of a checklist, flow diagram or explicit text, they specify a minimum set of items required for a clear and transparent account of what was done and what was found in a research study, reflecting in particular issues that might introduce bias into the research.⁵

The most widely-known guideline to date is the CONSORT Statement. Recently revised, it is a 25-item checklist for authors of Randomized Controlled Trials to consider when describing their research findings. The hope is that by following these checklists, authors can provide a more complete picture of their research or at least account for omissions in information. The CONSORT checklist is freely downloadable at:

www.consort-statement.org/

Some sample criteria from the CONSORT Statement include:

- Eligibility criteria for patients;
- Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed;
- Type of randomization;
- The numbers of participants who were randomly assigned, received intended treatment, and were analyzed for the primary outcome;
- Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses.

The evidence is already in on the effectiveness of employing reporting checklists and the results are encouraging.^{6,7}

Consequently, a number of larger titles have begun to endorse one or more reporting checklists. How they ensure adherence to reporting standards varies between titles. Some insist authors supply evidence that their manuscript conforms to the information inclusion criteria outlined in reporting guidelines such as CONSORT. For example, the *Journal of the American Medical Association* and the *BMJ* both demand authors upload a copy of the relevant reporting checklist with their submission, be it CONSORT for a Randomized Controlled Trial or one of myriad other options. Other journals prefer to *advise* authors to consult the reporting guidelines appropriate for their study. The benefits of both approaches will be explored in next month's issue of *EON*.

Reporting guidelines do not necessarily correct problems inherent in a manuscript but they can illuminate where problems exist.

⁵ EQUATOR Network *Introduction to reporting guidelines* www.equator-network.org. Accessed July 19, 2010.

⁶ Plint AC, Moher D, Morrison A., Schulz KF, Altman DG, Hill C, Gaboury I. Does the CONSORT checklist improve the

quality of reports of randomised controlled trials? A systematic review. *Med J Aust.* 2006; 185(5): 263–267.

⁷ Egger M, Jüni P, Barlett C. Value of flow diagrams in reports of randomized controlled trials. *JAMA.* 2001; 285(15):1996–1999

Improving Reporting Standards

continued

Consequently they are a useful resource for authors, reviewers, and editors alike.

Why Should Editorial Offices Get Involved?

Clearly, as editorial office staff, we look to ensure our titles provide superior quality peer review and publish, if not always the very best articles, then articles that have been substantially improved before publication. Implementing a reporting standards policy that includes endorsing the employment of reporting checklists represents a tremendous approach towards achieving that objective. Though studies are still under way to determine a causal link, one might speculate that if journals publish more articles written in such a way as to replicate the study, there stands a greater chance of citation.

Setting up a reporting policy is relatively straightforward (and will be discussed in next month's companion article). The job has been made easier by the creation of an organization called the EQUATOR Network. This group was created to provide a portal of resources to expand the use of reporting guidelines. Their express hope is that such guidelines become a

widespread, and perhaps routinely used, facet of the submission and peer-review process. By visiting www.equator-network.org, a rich library of materials can be found ranging from the guidelines themselves, news of on-going research in the use and success of guidelines, and sample editorials from journals written ahead of their respective launches of campaigns to improve reporting standards. ISMTE and EQUATOR have promoted each other's activities in the past and will continue to do so in the future.

Busy editors, along with publishers who most likely cannot expend effort on something with no discernable opportunity for income generation, can spend little time to research the best approach to improving reporting standards, developing a comprehensive policy, and providing the necessary resources ahead of launch. For pro-active editorial office staff, this represents an excellent opportunity to take the lead on an activity with clear benefits for readers and authors alike.



Going to the ISMTE North American Conference?

Meet with Jason Roberts from 8-8:30 a.m. on Wednesday, August 4, for a breakfast panel discussion on "The EQUATOR Network - how editorial offices of biomedical and science journals can help improve the quality of manuscripts for publication."