

The EQUATOR Network: facilitating transparent and accurate reporting of health research



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Although billions are spent each year on health research, much of this research is not reported adequately in the literature. This seriously undermines the usability of reported findings and misleads clinicians, researchers, policymakers and, ultimately, patients. The EQUATOR Network is a new international initiative that aims to improve the clarity, completeness and transparency of scientific publications by providing resources and education relating to the reporting of health research and assisting in the development, dissemination and implementation of robust reporting guidelines.

'If the CONSORT recommendations were followed in the reporting of future studies, the effects of Morita therapy would be clearer. Much important data within the included studies were so poorly reported that clinicians, funders and recipients of care might have reason to feel let down by the research community.'

He, Y and Li, C, Morita therapy
for schizophrenia, *Cochrane review*¹

Systematic reviews stand proudly on the top of the evidence pyramid²; Cochrane reviews have the most privileged place of all. Clinicians, health care researchers and policymakers rely on synthesized evidence more than ever before. And yet hundreds of systematic reviewers are struggling with the problem of poor reporting of primary studies when developing those reviews. Inadequate description of research methods and findings prevents critical evaluation of the quality and relevance of the research, undermines confidence in the results, and limits the further use of such research.

There is a wealth of evidence that much of the published health research is reported poorly. We provide just a few examples here to demonstrate a lack of essential information in research articles. Chan and Altman³ assessed the reporting of several important methodological aspects in 519 published randomized trials indexed in MEDLINE in December 2000. Characteristics closely related to the validity of research findings (i.e. power calculation, definition of primary outcomes, random sequence generation and allocation concealment) were each described adequately in less than half of the publications. Moher *et al*⁴ examined epidemiological and reporting characteristics and bias-related aspects of 300 systematic reviews (of which 125 were Cochrane reviews) indexed in MEDLINE during November 2004. The overall quality of reporting of key aspects of methodology was very inconsistent with particularly discouraging findings for non-Cochrane reviews. Glasziou *et al*⁵ assessed descriptions of treatments in 80 studies, trials and systematic

reviews published during one year in *Evidence-Based Medicine*, a journal that is aimed at doctors working in primary care and general medicine. Crucial elements of the intervention descriptions were missing in 41 of those published studies thus preventing clinicians making use of the treatments in their clinical practice.

Writing, reviewing and editing research publications is not easy. However, this rather grim picture of the quality of research descriptions indicates a collective failure of authors, peer reviewers and editors (as well as research funders and publishers) to ensure the availability of reliable health research publications.

What can be done to improve the reporting of research?

Guidelines and checklists are tools designed to help individuals meet certain standards by providing sets of rules or principles that guide towards appropriate behaviour⁶. They are successfully used in many areas of human activities (e.g. aviation checklists, clinical practice guidelines, surgical checklists⁷).

Similarly, many guidelines and checklists have been developed by groups of scientists, methodologists and journal editors to guide descriptions of various types of health research studies. Most biomedical journals require authors to comply with the 'Uniform Requirements for Manuscripts Submitted to Biomedical Journals' prepared by the International Committee of Medical Journal Editors (ICMJE)⁸. This document states the ethical principles in the conduct and reporting of research and provides recommendations relating to specific elements of editing and writing. In addition to the Uniform Requirements, a number of guidelines provide specific recommendations on the description of the methods and findings of specific types of research. These reporting guidelines specify a minimum set of items needed for a clear and complete account of what was done, reflecting on particular issues that might introduce bias into the research. Adherence to reporting guidelines improves the accuracy and transparency of publications^{9,10}. Probably the most influential so far is the CONSORT Statement¹¹ for the reporting of randomized controlled trials; other examples include STROBE¹² for observational studies in epidemiology, and STARD¹³ for diagnostic accuracy

studies, but many others have been published in recent years¹⁴.

Most of these guidelines were developed in isolation without the focused collaboration or co-ordination in their development or implementation that can be seen, for example, in the clinical practice guideline field¹⁵. That isolation contributes to the limited uptake of the available guidance and the as yet limited influence of guidelines on the quality of health research publications.

The EQUATOR Network

In 2006, the UK NHS National Knowledge Service, driven by the motivation to provide clinicians with more usable and better quality research information, granted funds to initiate the EQUATOR (Enhancing the QUALity and Transparency Of health Research) Network programme. This international initiative seeks to improve the quality of scientific publications by promoting transparent and accurate reporting and to contribute substantially to improving the reliability of published health research.

The EQUATOR Network is an 'umbrella' organization that provides information resources, training, evaluation feedback, and support for the development of robust reporting guidelines (and hopefully much more in the future) to the key players that influence the quality of health research information: researchers (authors), journal editors, peer reviewers and scientists developing reporting guidelines.

In October 2007 the EQUATOR Network launched its website¹⁶, which currently provides links to over 80 published reporting guidelines. In general, guidelines take the form of checklists, with varying amounts of accompanying explanation and examples. In the first nine months the website had over 12,000 visitors from 149 countries. A major upgrade is in process that will enhance the site with more background information about the guidelines, an online discussion forum and new educational materials.

Education is an important element of the EQUATOR Network's activities. Several workshops have already been held. So far these have targeted mainly journal editors, who play a vital role in determining and safeguarding the quality of publications. Encouraging journal editors to

support research reporting guidelines and use them actively in peer and editorial review is one of the most important EQUATOR tasks. Kay Dickersin with her colleagues analysed discussions of 12 editorial manuscript meetings at *JAMA*¹⁷. They classified 2,376 spoken and written phrases concerning 102 manuscripts into three broad categories – science, journalism and writing. The most frequent phrases used at the editorial meetings concerned scientific issues (1,274 phrases, 54%), including research design and methods, presentation and interpretation of results, analysis methods, population studied, power and sample size, measurement variables and measures used, the need for additional data, generalizability, quality of data, and conflict of interest. These researchers also highlighted the major role of peer review in editorial decision-making, demonstrated by the fact that more than 25% (459/1,773) of the spoken phrases referred to comments by reviewers. Although the authors cautioned against generalizing their results to other journals, one can clearly see the potential impact of better research reporting, which can be achieved by authors' adherence to reporting guidelines, on the efficiency of the editorial meetings.

Benefits for research and publishing community

The ultimate responsibility for the design and conduct of research and its clear and complete publication lies with the researchers. Teaching young researchers basic principles of good research reporting and raising awareness of the available reporting guidelines can reduce many current problems and improve the quality of submitted manuscripts. Collaboration with organizations involved in research and professional education is crucial. Experienced researchers, as well as experienced editors and peer reviewers, can also benefit from the use of reporting guidelines. Use of reporting checklists by authors and peer reviewers promotes the completeness of the research report and strengthens the whole editorial process. It can improve and speed up journal decision-making.

Bringing together all available reporting guidelines into one portal should facilitate their wider use by authors. Journals can significantly contribute to this process by providing a link to the EQUATOR resource centre from their instructions

to authors and by encouraging authors to use the appropriate guidelines. Linking to the EQUATOR portal also alleviates the need for journals to seek the latest guidance on reporting relevant health research and to update their instructions frequently. Time and money are saved while the authors are still best served. Some journals and publishers have already implemented this policy and EQUATOR website statistics show growing traffic coming from those journals¹⁸.

Strong support from health research funders and publishers is vital for the success of this effort. Those organizations can help significantly to raise the awareness of problems associated with poor research reporting by employing strategies that encourage the production of high quality research reports and by introducing measures that assess the implementation of reporting guidelines. Further, they can provide much-needed financial support and leadership in the development and maintenance of robust reporting guidelines.

Checklists prevent errors and omissions. Few would knowingly fly on a plane where the pilot did not use a takeoff and landing aircraft checklist. A similar culture is needed to ensure the completeness and accuracy of research reports. The EQUATOR Network will assist in developing those processes.

Publishers and both public and private research funders have a societal responsibility to the research and clinical communities and should support initiatives like the EQUATOR Network. Although the EQUATOR project has now attracted the attention of some research funders (UK National Institute of Health Research and Medical Research Council), the support is still not sufficient to allow all essential activities. In order to become a truly international initiative, the Network needs global support from a wide range of organizations.

The EQUATOR Network's future plans

The EQUATOR Network was formally launched at an inaugural meeting in London in June 2008^{19,20}. Invited speakers drew attention to many problems relating to the poor standard of current health research reporting and its consequences for a wide range of research users, and discussed possible solutions and challenges²¹. The EQUATOR Network aims to expand the nature and geographical spread of its activities by involving more individuals,

organizations and countries and through fostering closer relationships with its major stakeholders. Additional financial resources will allow the further development of EQUATOR's research and knowledge translation programmes. The EQUATOR Network will take a lead in addressing problems highlighted at its launch meeting and elsewhere, including clarifying misconceptions about reporting guidelines, assisting in the development of robust and truly helpful guidelines and helping to overcome barriers to their implementation. EQUATOR will continue to respond to suggestions from the many relevant groups with an interest in improving the credibility and value of research designed to improve health.

Health research is leading the way in the effort for clear, complete and transparent reporting, although some encouraging initiatives are also emerging in other research areas^{22,23}. What distinguishes health research from other scientific activities is the nature of the research population. Many individuals volunteer and willingly take the risk of participating in research studies to improve health care for future generations. We should always have in mind the responsibility to the research participants when conducting and reporting the findings of those studies. Recognition of this responsibility must be clearly demonstrated in our actions.

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