



EQUATOR Network: An umbrella organisation to tackle bias in the scientific literature

by Catherine Mary

A report on Ian Needleman's opening lecture at the 27th EMWA Conference, 20-22 November 2008, London, UK

When modern physicians read, in the *Treatise of the Scurvy* by James Lind [1], that the effect of '2 oranges and 1 lemon' was compared with that of 'two spoonfuls of vinegar three times a day' in patients at different stages of the disease, they will have little doubt that experimental bias is present.

Albeit less obvious, in the area of evidence-based medicine, methodological bias still threatens the scientific literature. This was demonstrated by Professor Ian Needleman (UCL Eastman Dental Institute, International Centre for Evidence-based Oral Health, Cochrane Oral health Group) in his opening lecture at the 27th EMWA conference. His lecture concerned the effective use of research data in healthcare and the threats to achieving this.

An emerging picture suggests that most articles published in medical journals are misleading, and authors of a recent study state that "Simulations show that for most studies and settings, it is more likely for a research claim to be false than true" [2]. Methodological and reporting bias have been identified at various levels of clinical reporting including concealment in clinical trials, the choice of reported outcomes and the choice of published results.

In the mid-1990s, several studies showed that bias protection in data published from meta-analyses can lead to considerable overestimation of the effect of a treatment [3] [4] [5]. Schultz et al. investigated the association between methodological quality and estimated treatment effect in 33 meta-analyses from the Cochrane Pregnancy and Childbirth Database [3]. They showed that the treatment effect was overestimated by 41% in inadequately concealed trials, by 30% for trials where the method of concealment was unclear or not stated, and by 17% in trials that were not double blind [3].

The impact of methodological weakness on bias further varies depending on whether the outcome is objective or subjective, as shown in a recent meta-epidemiological study of 146 meta-analyses embracing 1346 trials in a wide variety of clinical disciplines [6]. The authors quantified the ratio of odds ratios for intervention effects in trials with inadequate or unclear allocation concealment compared with trials with adequate concealment. There was little evidence of bias in trials assessing all-cause mortality or other objectively assessed outcomes such as laboratory measure-

Major aims of the EQUATOR network:

- to supply resources via the internet-based resource centre
- to develop a training programme (first training workshop delivered in Spring 2008)
- to support the development, dissemination and implementation of reporting guidelines
- to assess annually how journals implement reporting guidelines
- to conduct audit of reporting quality across the health research literature.

ments. In contrast, studies with subjectively assessed outcomes, such as patient-reported outcomes or physician-assessed disease outcomes, were associated with overestimation of intervention effects in studies with inadequate allocation concealment or lack of blinding [6].

Inadequate outcome reporting itself represents a significant source of bias. According to several studies, outcomes are selectively reported within publications and tend to be favoured if they are statistically significant. A cohort study of 102 randomised clinical trials showed that medians of 50% of efficacy outcomes and 65% of harm outcomes per trial were incompletely reported and could not be included in a meta-analysis. When published trials were compared with protocols, 62% of trials had at least 1 primary outcome that was changed, introduced or omitted [7].

Evidence of bias resulting from selective publication of results is also accumulating. A study comparing a review of published clinical trials with a review of trials registered in a cancer trials registry emphasises that positive results are more likely to be published than negative ones [8]. The study examined the survival impact of initial alkylating agent versus combination chemotherapy for the treatment of two cancers: advanced ovarian cancer and multiple myeloma. When only published trials were considered in the pooled analysis, combination chemotherapy showed a statistically significant survival advantage. This benefit was lost or diminished when all of the registered trials were considered [8].

Because healthcare is based on the available research evidence, inefficient use of research data hinders effective healthcare. The impact in public health can be huge, as

EQUATOR Network: An umbrella organisation ...

exemplified by the implementation of preventive measures against sudden infant death syndrome (SIDS). Although a significant benefit of putting infants to sleep on their backs was reported in 1970, routine advice to put them to sleep in this position was not given until the 1990s [9]. Systematic review of preventable risk factors for SIDS from 1970 would have led to earlier recognition of the risks of putting infants to sleep on their fronts, and might have prevented over 10,000 infant deaths in the UK and at least 50,000 in Europe, the USA, and Australasia.

Coordinated efforts of all stakeholders are needed to promote good reporting and standardisation of clinical trials. With this goal in mind, the CONSORT (Consolidated Standards of Reporting Trials) recommendations were set up in 1996. They include a checklist to guide the reporting of clinical research and a flowchart showing patient flow through the various stages in clinical trials. The checklist includes 21 headings and subheadings, intended to ensure that all the important aspects of trial quality are adequately addressed. These aspects include the description of the hypothesis, randomisation and blinding methods, patient follow-up, and the effect of trial quality on the interpretation of the results.

The CONSORT recommendations have so far been adopted by most general medicine and more than 100 specialist biomedical journals [10]. A recent meta-analysis that compared reporting in journals that have adopted the CONSORT recommendations with that in those that have not and within journals before and after adoption showed that adopting CONSORT had helped to improve the quality of reporting, but that journals do not enforce it enough [11].

Implementation of the CONSORT guidelines needs therefore to be strengthened through stronger editorial commitment and the development of training and resources. These developments are among the goals of the EQUATOR (Enhancing the Quality and Transparency of Health Research) network (See box)[12]. Arising from the work of CONSORT and other groups, the EQUATOR network seeks to improve the quality of health research literature by promoting the transparent and accurate reporting in scientific journals. Its inauguration in 2006 took the promotion of good reporting a stage further. It aims to act as an inter-

national 'umbrella' organisation covering all areas of health research and bringing together all stakeholders including developers of reporting guidelines, editors and peer reviewers, researchers, medical writers and publications professionals. EQUATOR, which is funded by public and private partners, held its official launch meeting in London in June 2008.

Catherine Mary

*Avicenne
Caluire, France
contact@avicenne-sciences.com
www.avicenne-sciences.com*

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Speaking of 'respectively'...

If you connect both speaker sets to terminals A and B respectively to deliver sound at the same time don't connect a speaker to more than one pair of speaker terminals.

Even if you leave *respectively* out here, you are still at a loss as what to do. At least we were!

Alistair Reeves
a.reeves@ascribe.de

Vital signs

Dear TWS

Along with, I guess, every other member of EMWA I recently received a Data Check of membership information. As a Nick Thompson Fellow, I am on the database as a life member. Those who know that I've not been too well of late will, I hope, be pleased to hear that my life membership expires on December 31, 2050. I'll be 104.

I'll do my best to comply with the prediction of the EMWA computer.

Geoff Hall
Geoffreyhall@aol.com