

An Introduction to StatReviewer

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Conflict of Interest

- We are the founders of the StatReviewer system, a commercial product
- Tim is affiliated with several journals and an academic institution, but they are in no way involved in this project

The Problem

- The poor quality of much published medical research has been labeled as a “scandal” (Altman, 1994).
- Many published articles suffer from low statistical power, errors in fact, errors in reporting, skewed or biased findings, and findings that are even maliciously misleading *
- The problem of low quality research reports is so prevalent that one author has begun to hypothesize that most research findings are actually false (Ioannidis, 2005).

Why is There a Problem?

- Most peer reviewers are not professional methodologists or statisticians.
 - It has been observed that despite their good intentions, peer reviewers often provide inaccurate statistical criticism or advice to submitting authors (Altman, 2002; Cicchetti, 1991).
- Because most medical researchers are themselves not professional statisticians, they often lack the expertise to evaluate critically their own approach to the analysis or do not possess the skills to effectively respond to the reviewer's assessment of it.

Why is There a Problem?

- Only a fraction of journals (33%), employ a professional statistician to assist in the review process or to arbitrate the conflicting advice that is received by authors (Goodman et al., 1998).
- A second problem encountered in peer review is the simple lack of qualified/unbiased reviewers who have time to volunteer for conducting peer review. The best scientists are often the busiest and rarely have time to volunteer for peer review.
- Thus, despite the best intentions of all involved, the peer review system is not particularly well suited to provide high quality criticism of the statistical methods of reviewed manuscripts (Horrobin, 2001).

StatReviewer Solution

- The application automates elements of statistical/methodological reviewing
 - Standardized reporting guidelines (CONSORT, STROBE, STARD, PRISMA)
 - General statistical reporting
 - Uniform requirements for medical journals

Inside StatReviewer

- Interface
- 4 Applications in 1:
 - Parse – any document type
 - Categorize – determine the manuscript type
 - Scan – reporting
 - Report – 4 different styles

Reporting

1. Classic Review
 2. Editor Review
 3. Checklist
 4. Scores – quality, risk
- Consistency & Education
 - Improving the Reporting Culture

8a Randomization: Sequence generation

Complete.

8b Randomization: Type

Please report if the randomization assignments were generated without restriction (e.g., simple randomization), or if restrictions were used such (e.g., restricted randomization, blocked randomization, stratified randomization, or minimization).

9 Randomization: Allocation Concealment Mechanism

To prevent selection bias, it is important to conceal future randomization assignments from the investigators. Please report how the foreknowledge of future assignments were concealed from the investigators who were enrolling participants by reporting:

- How the randomization schedule was concealed from the investigators (e.g., third-party allocation, central randomization, pharmacy administered).

10 Randomization: Implementation

The process of randomizing participants into a trial has three steps: sequence generation, allocation concealment, and implementation. To properly describe these steps please report:

- Who generated the allocation sequence (e.g., study statistician)?
- Who assigned participants to study groups (e.g., the research nurse opened the sequentially numbered envelope containing the randomization assignment)
- Who enrolled participants into the study (e.g., the research assistant evaluated eligibility, obtained informed consent, and enrolled the participants).

11a Blinding

Complete

A Statistical/Methodological Review

