

# Consequences of poor reporting for the development of Cochrane reviews

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# Research reporting is like swimwear



**Research reporting is like swim-  
wear**

**What it reveals is  
suggestive  
...but what is  
conceals is vital**

**Mahajan 2007 (evidence-mangled: apologies!)**

THE LANCET

"In addition to being a breach of human rights, intimate partner violence is associated with serious public health consequences that should be addressed in national and global health policies and programmes."

# Overview

- Why is study reporting so important to systematic reviews?
- What is the impact of study reporting on systematic reviews?
- What is the quality of reporting of Cochrane and other systematic reviews?

# Overview

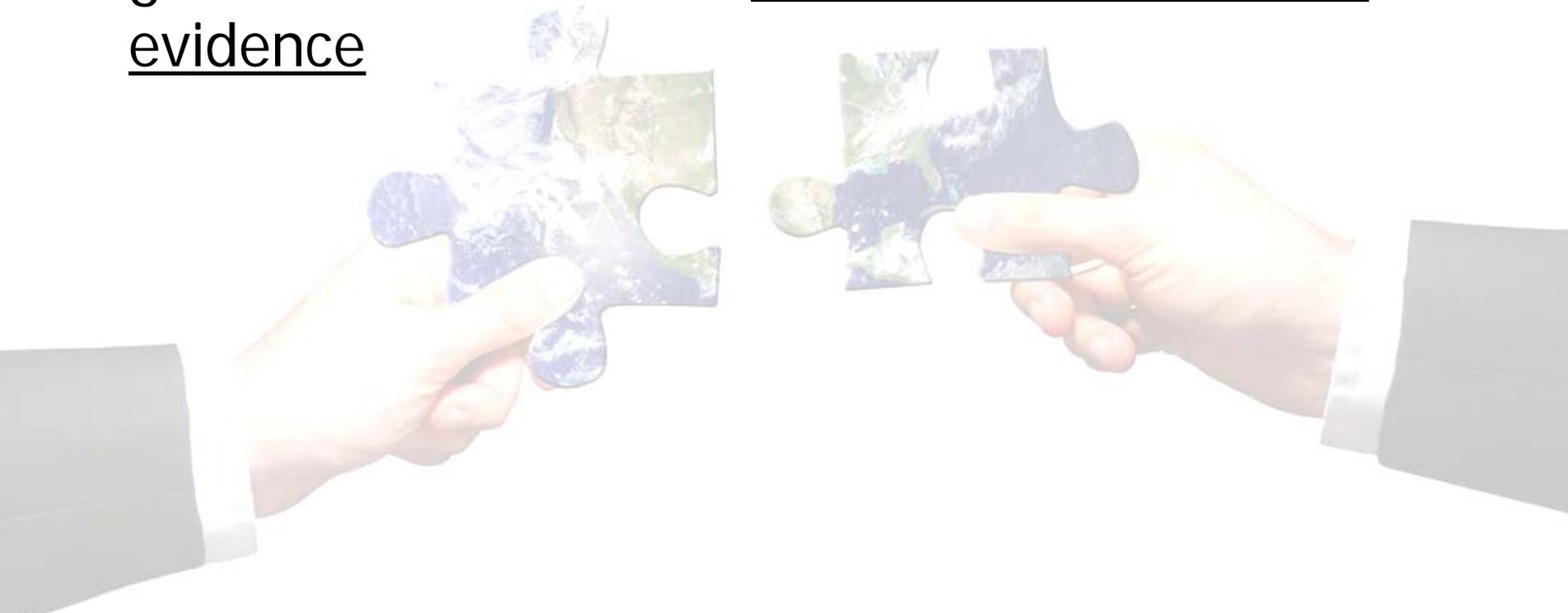
- Why is study reporting so important to systematic reviews?
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# What is Evidence-Based Healthcare?



# What is Evidence-Based Healthcare?

- Achieving the best care for individual patients (or communities) that addresses their problems, based on great clinical skills and best available research evidence



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[Peer Review Congress](#)

## Discussion Sections in Reports of Controlled Trials Published in General Medical Journals

### Islands in Search of Continents?

Michael Clarke, DPhil; Iain Chalmers, MSc

*JAMA*. 1998;280:280-282.

## Discussion Sections in Reports of Controlled Trials Published in General Medical Journals

### Islands in Search of Continents?

Michael Clarke, DPhil; Iain Chalmers, MSc

- Research (publications) should always begin with a systematic review (within introduction) and conclude with an updated systematic review of the evidence (within discussion)
- Need to report what do we already know and what does the new study add to the totality of the evidence

C. X. 20.

*La Libris & Bibliotheca*

T R E A T I S E

*In Libris* OF THE *Collegii Regii*  
*Medici Edinburgae.*

S C U R V Y.

IN THREE PARTS.

*Allegii* CONTAINING *Prægiæ*

An inquiry into the Nature, Causes,  
and Cure, of that Disease.

*Medicor.* Together with *Edinburg.*

A Critical and Chronological View of what  
has been published on the subject.

By JAMES LIND, M. D.

Fellow of the Royal College of Physicians in *Edinburgh.*

E D I N B U R G H:

Printed by SANDS, MURRAY, and COCHRAN

For A. KINCAID & A. DONALDSON.

MDCCLIII



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# Research totality in oral health

## RESEARCH REPORTS

### Clinical

D.R. Moles<sup>1\*</sup>, I.G. Needleman<sup>1</sup>,  
R. Niederman<sup>2</sup>, and J. Lau<sup>3</sup>

<sup>1</sup>Eastman Dental Institute for Oral Health Care Science, University College London, 256 Gray's Inn Road, London, WC1X 8LD, UK; <sup>2</sup>dsm-Forsyth Center for Evidence-Based Dentistry, The Forsyth Institute, Boston, MA, USA, and Department of Health Policy and Health Services Research, Goldman School of Dental Medicine, Boston University, Boston, MA, USA; and <sup>3</sup>Center for Clinical Evidence Synthesis, Tufts-New England Medical Center, Boston, MA, USA: \*corresponding author, d.moles@eastman.ucl.ac.uk

*J Dent Res* 84(4):345-349, 2005

## Introduction to Cumulative Meta-analysis in Dentistry: Lessons Learned from Undertaking a Cumulative Meta-analysis in Periodontology

- Only 8/25 trials adequately reported to include in the meta-analysis

# Excluding studies due to missing information



Uncertainty

Risk of selection bias



Potentially huge  
impact on healthcare



Precision

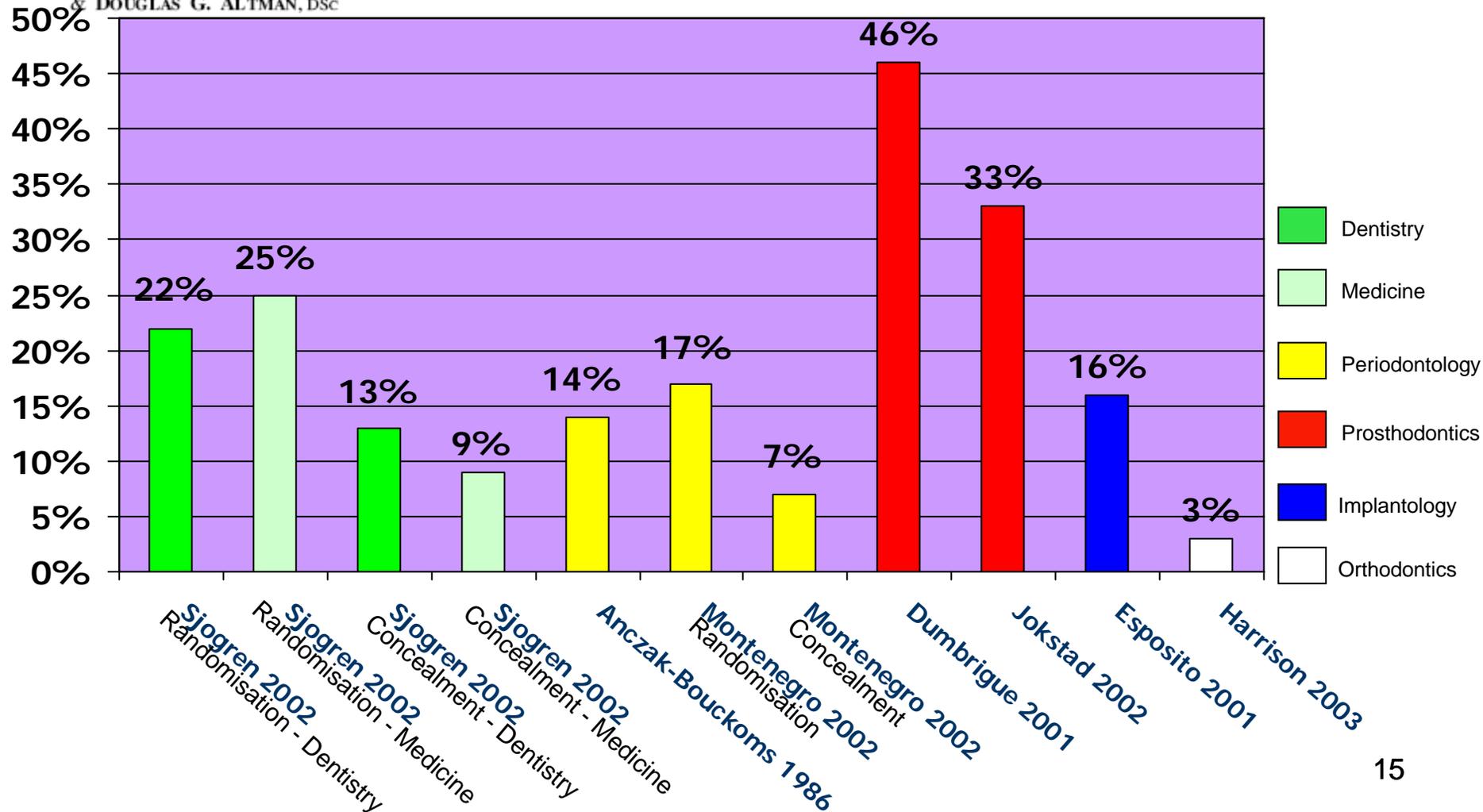


# Reporting of methodology



# Improving the completeness and transparency of reports of randomized trials in oral health: The CONSORT Statement

IAN NEEDLEMAN, PhD, FDSRCS (ENG), HELEN WORTHINGTON, PhD, DAVID MOHER, PhD, KEN SCHULZ, PhD  
& DOUGLAS G. ALTMAN, DSC



## Impact of poor reporting of methods

- Internal validity
  - Risk of bias
  - Balancing of confounders
  - Analytic errors
- External validity
  - Types of patients
  - Types of intervention
  - Setting

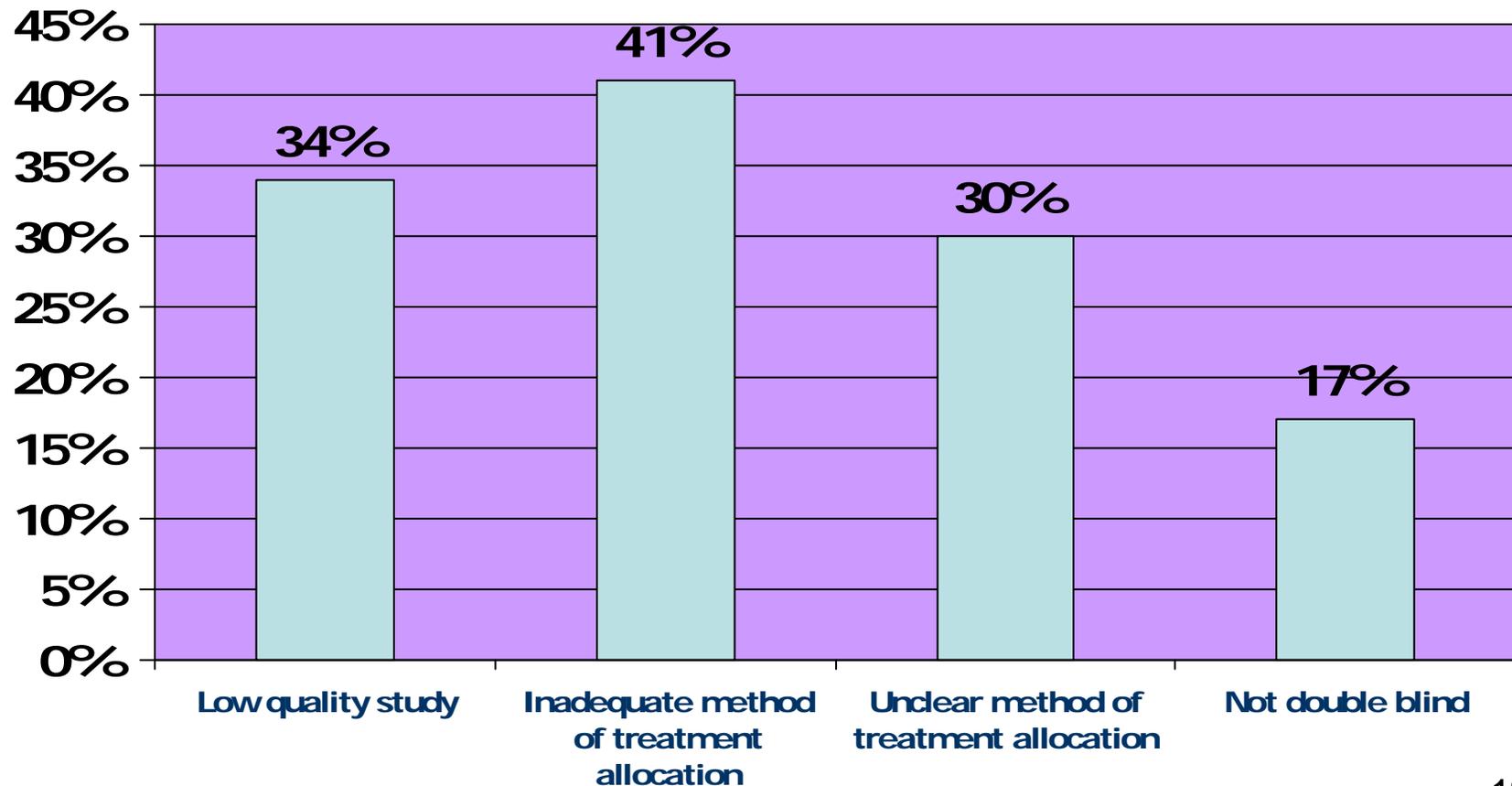


# Empirical evidence of bias

- What is the effect of inadequate methods of bias protection on the magnitude of outcome size?
- Studies in mid-late 1990s investigated effect of bias protection on data from published meta-analyses
- Comparison of ORs in meta-analyses of interventions; adequate vs. inadequate methodology: including randomisation, masking

# Bias and exaggeration of treatment effect

Schultz et al. 1995,  
Moher et al 1998,  
Juni et al. 2001



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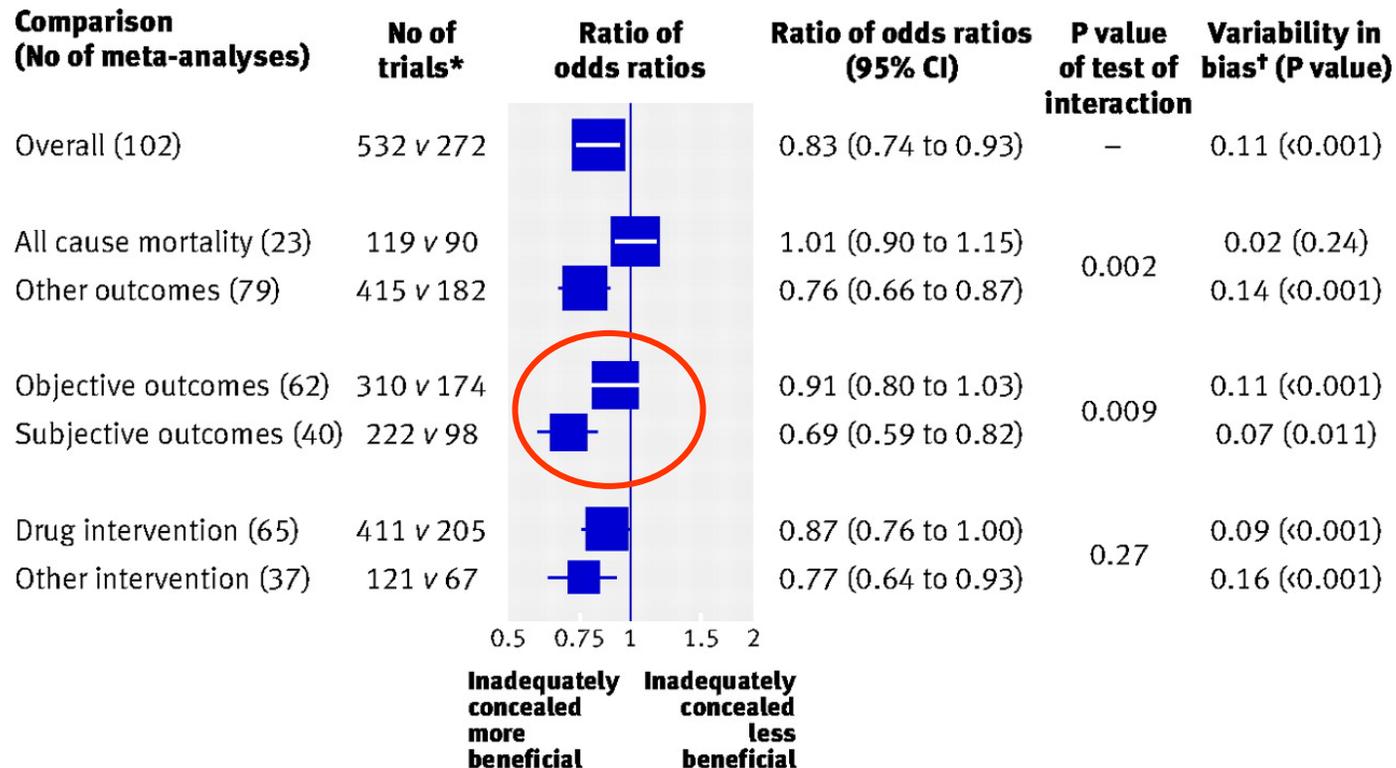
## Empirical evidence of bias in treatment effect estimates in controlled trials with different interventions and outcomes: meta-epidemiological study

Lesley Wood, research student,<sup>1</sup> Matthias Egger, head of department and professor of epidemiology and public health,<sup>2</sup> Lise Lotte Gluud, senior registrar,<sup>3</sup> Kenneth F Schulz, vice president of quantitative sciences and clinical professor,<sup>4</sup> Peter Jüni, head of division and reader in clinical epidemiology,<sup>2</sup> Douglas G Altman, director and professor of statistics in medicine,<sup>5</sup> Christian Gluud, head of department,<sup>3</sup> Richard M Martin, reader in clinical epidemiology,<sup>1</sup> Anthony J G Wood, research assistant,<sup>1</sup> Jonathan A C Sterne, professor of medical statistics and epidemiology<sup>1</sup>

**BMJ, 2008; 336: 601 - 605**

- 146 meta-analyses (1346 trials)

**Fig 1 Ratios of odds ratios comparing estimates of intervention effects in 532 trials with inadequate or unclear allocation concealment versus 272 trials with adequate concealment.**

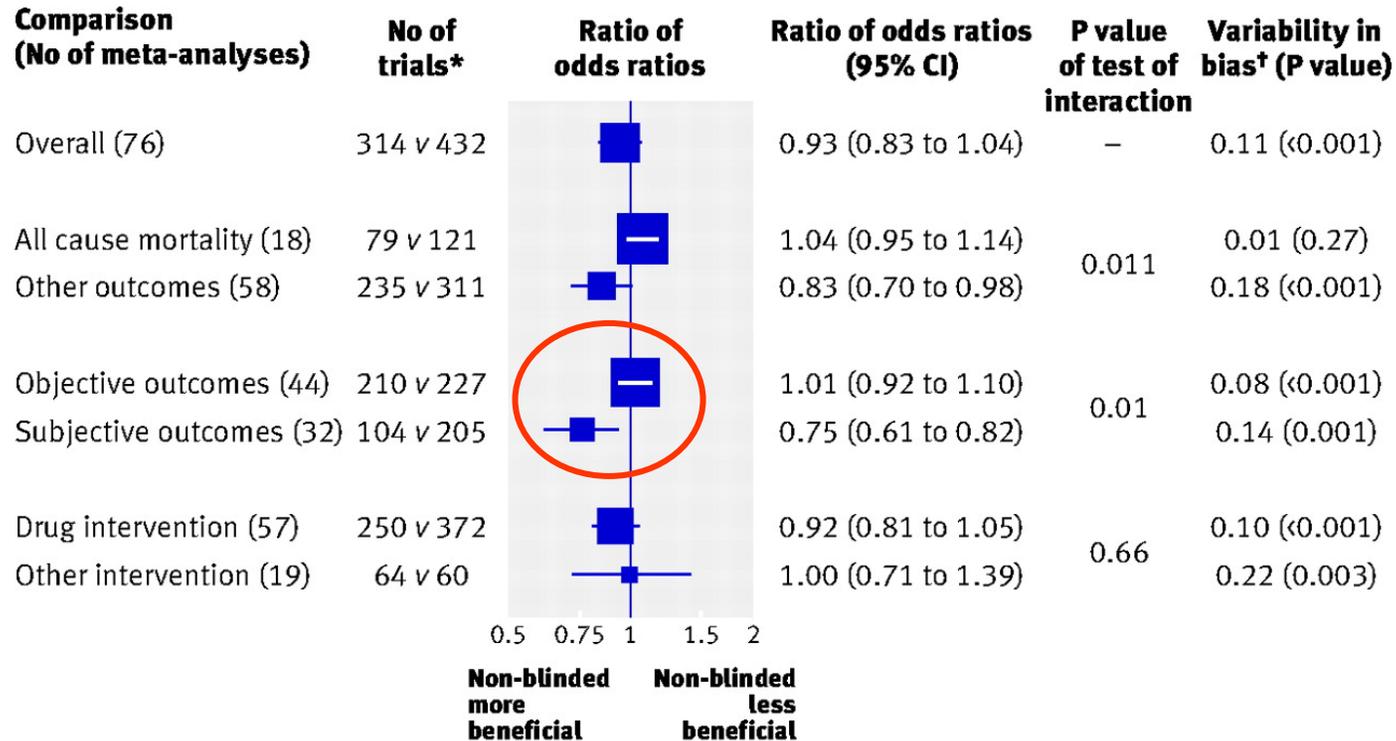


\* Inadequately or unclearly concealed v adequately concealed

† Between-meta-analysis heterogeneity variance

**Wood, L. et al. BMJ 2008;336:601-605**

**Fig 2 Ratios of odds ratios comparing intervention effect estimates in 314 non-blinded trials versus 432 blinded trials.**



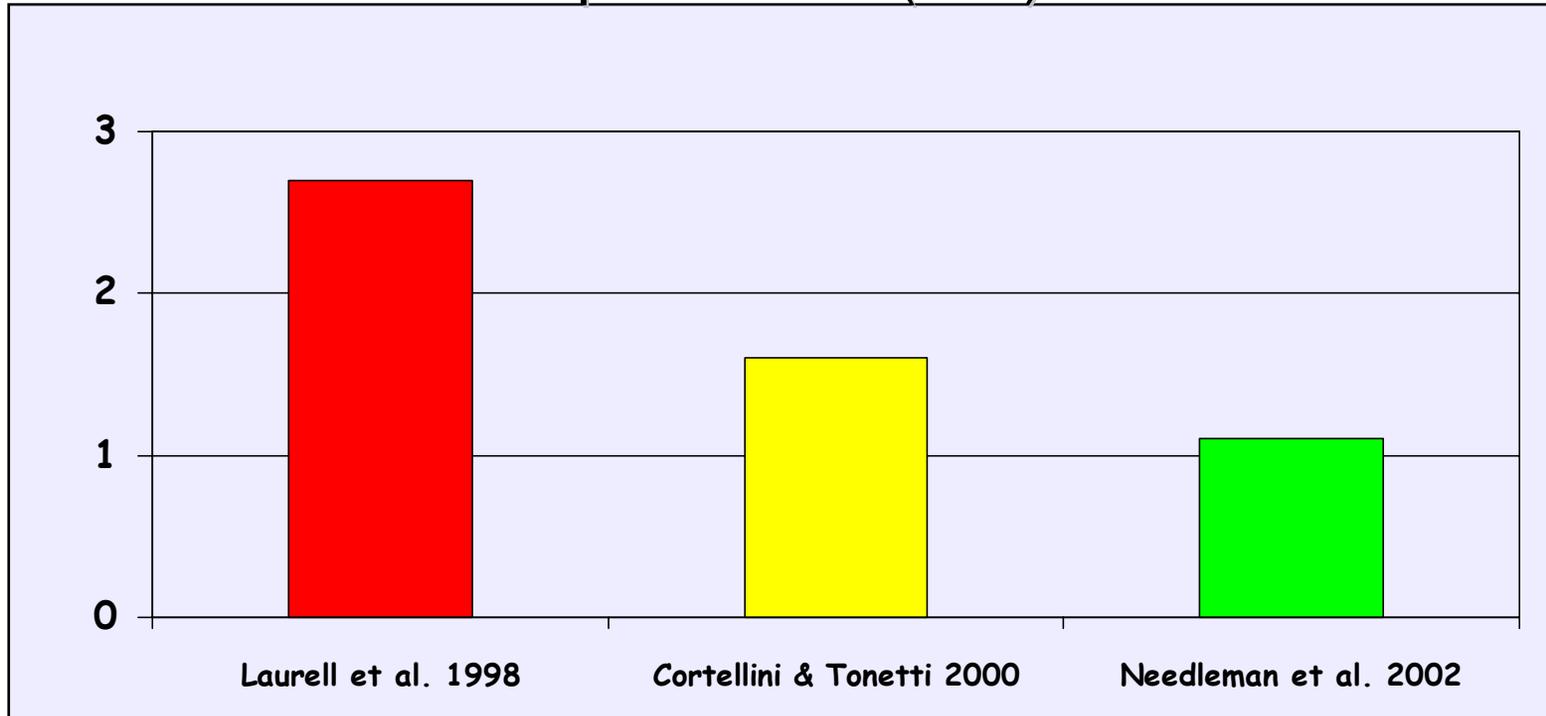
\* Non-blinded v blinded

† Between-meta-analysis heterogeneity variance

**Wood, L. et al. BMJ 2008;336:601-605**

## Evidence of dose dependent impact of bias in three meta-analyses of guided tissue regeneration?

### Additional clinical improvement (mm) for GTR



- The greater the risk of bias of included studies, the greater the apparent benefit of GTR over access flap surgery
- Treatment effect differs between the three meta-analyses by more than 2x
- Needleman, Worthington et al. 2006 Cochrane Library

# Research reporting

- Reporting quality is problematic across healthcare preventing studies contributing to the totality of evidence
- Key details of methods with the potential to distort outcomes are frequently poorly reported impairing the evaluation of risk of bias
- As a result, conclusions for healthcare can be compromised hampering the development of innovation
- Research recommendations are a key component of systematic reviews. Poor reporting reduces the strength of recommendation for future research thereby interfering with innovation in healthcare

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ELSEVIER

Journal of Clinical Epidemiology ■ (2007) ■

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**Journal of  
Clinical  
Epidemiology**

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## ORIGINAL ARTICLE

# The reporting quality of meta-analyses improves: a random sampling study

Jin Wen<sup>a</sup>, Yu Ren<sup>b</sup>, Li Wang<sup>a</sup>, Youping Li<sup>a,\*</sup>, Ya Liu<sup>c</sup>, Min Zhou<sup>c</sup>, Ping Liu<sup>c</sup>,  
Lu Ye<sup>b</sup>, Yi Li<sup>b</sup>, Wei Tian<sup>d</sup>

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<sup>c</sup>Department of Epidemiology, West China School of Public Health, Sichuan University, Chengdu, China

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Accepted 3 October 2007

## Reporting quality of systematic reviews

- QUOROM (now PRISMA) statement
- Maximum score 18.0
- Overall: rise in score from 2000-2005 (10.5 -13.0)
- Cochrane reviews better than non-Cochrane reviews (14.2 vs. 11.7)
- *'Room still exists for improvements in the reporting quality of both Cochrane and paper-based articles'*

# Conclusions

- We spend huge amounts of effort and resource in designing and conducting research on humans – well covered by research governance
- Poor reporting quality rips the heart out of research evidence
- Improving the reporting of such studies could be the most rapid and cost-effective approach to improving healthcare in terms of R&D resources
- In view of the responsibilities of researchers, reporting standards should be considered within the ethical framework