Introduction to Research on Research – Waste in Research

David Moher
Centre for Journalology, Ottawa Hospital Research Institute; Stanford University METRICS group

19th October 2016
MiRoR meeting,
Ghent, Belgium

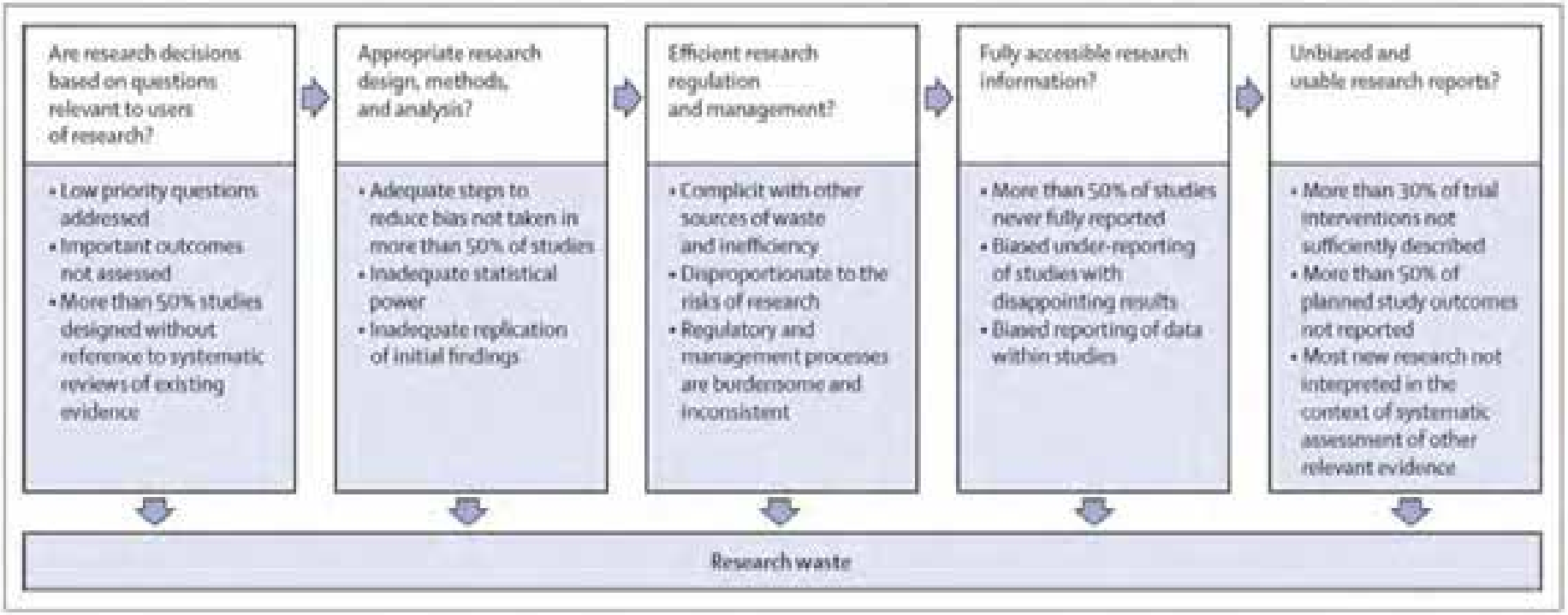
Disclosures

- Co-editor-in-chief *Systematic Reviews*
- Editorial board member of several journals
- Advisory member International Congress on Peer Review and Biomedical Publication
- University of Ottawa Medical Journal Faculty Advisory Board member
- Member of MiRoR group
- Member of the EQUATOR Network's executive group
- Member of the REWARD alliance team
- Received funding for journalology research from the Cochrane Collaboration; BioMed Central, Elsevier; and Garfield Foundation

Outline of talk

- Quality of reported clinical and preclinical research
- Efforts to improve the quality of published research
  - The ‘Waste in Research’ series
  - The REWARD alliance
  - Interventions to increase the value of research [reducing waste]

The research continuum



Context

- Massive publications-industrial complex
- About 6,000 publishers
- About 30,000 journals
- Produces about 3 millions manuscripts, annually, of which 50% are published

The published record

- It's tarnished ☹☹☹☹☹
- There is considerable avoidable waste in the biomedical industrial complex

Authors cannot adequately describe basic essential information for readers

- 10 essential elements about intervention
  - e.g., drug name, dose, route....
- examined 262 reports of randomized trials from most prominent oncology journals
- overall, only 11% of articles reported all 10 essential items

Duff JM et al. JNCI 2010 102:702-705

Delivering the best care to patients

- “Thoughtful consideration of reporting trial-related procedures that could assist with turning “best evidence” to “best Practice” would be worthwhile”
- “Careful and consistent reporting would help to promote safe and effective clinical application of oncology therapeutics ...”

Dancey JNCI 2010; 102:670-671

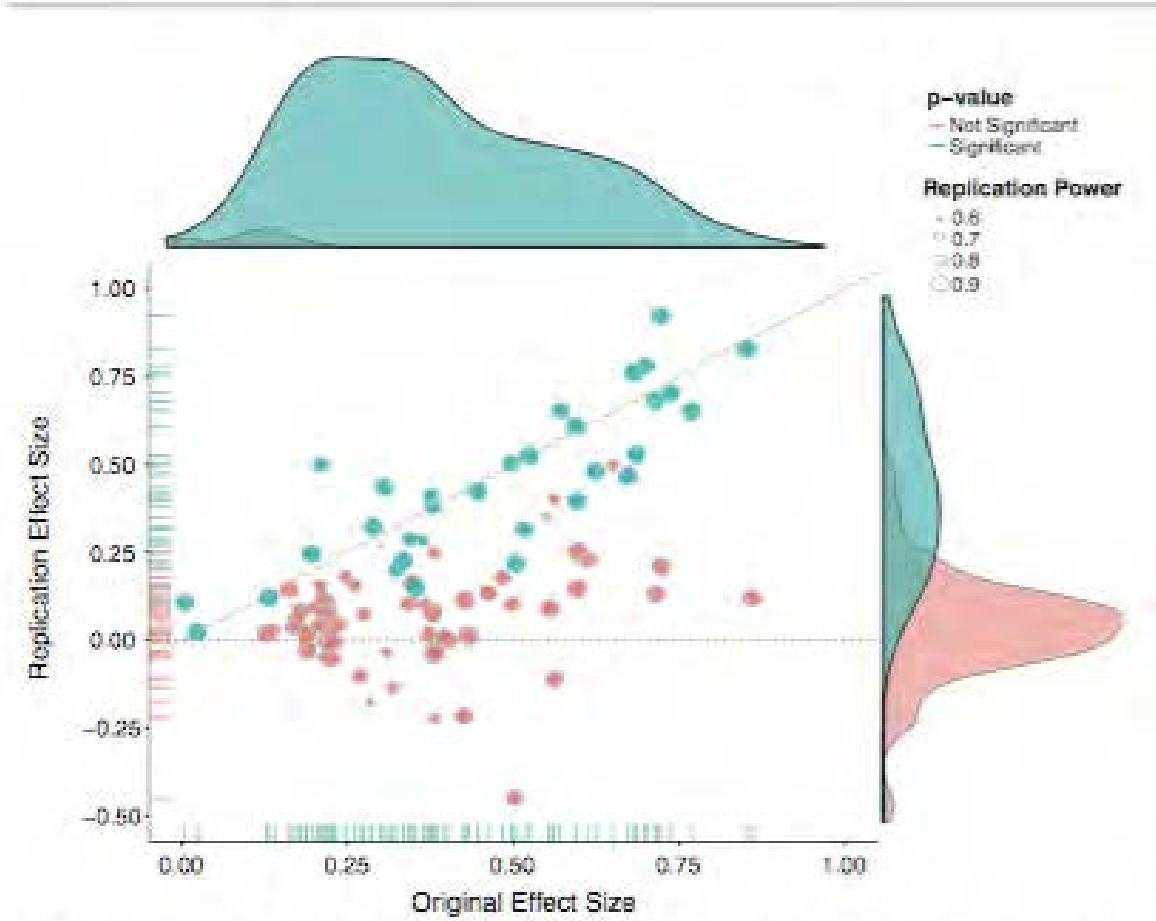


Fig. 3. Original study effect size versus replication effect size (correlation coefficients). Diagonal line represents replication effect size equal to original effect size. Dotted line represents replication effect size of 0. Points below the dotted line were effects in the opposite direction of the original. Density plots are separated by significant (blue) and nonsignificant (red) effects.

Open Science Collaboration, Science 349, aac4716 (2015). DOI: 10.1126/science.aac4716

Incomplete Reporting

Macleod et al., 2015

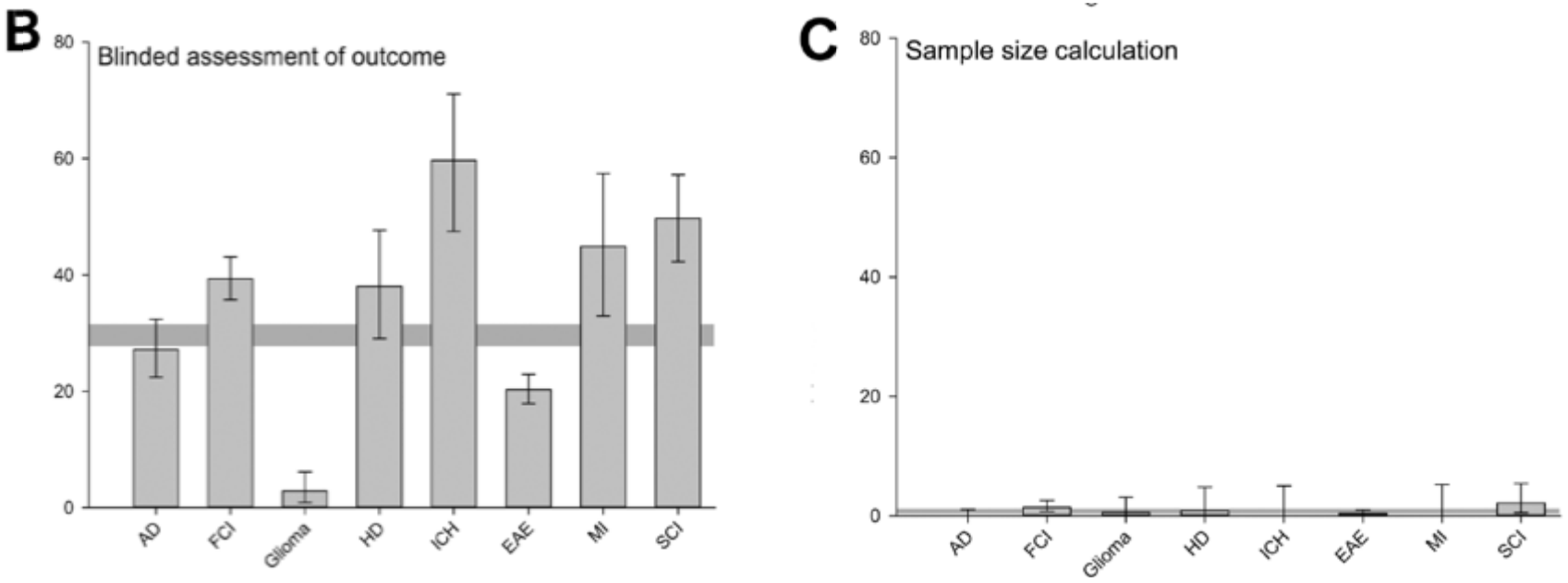


Fig 2. Prevalence of reporting of (A) randomisation, (B) blinded assessment of outcome, (C) sample size calculations, and (D) conflict of interest reporting in 2,671 publications describing the efficacy of interventions in animal models of Alzheimer's disease (AD, *n* = 324 publications), focal cerebral ischaemia (FCI, 704), glioma (175), Huntington's disease (HD, 113), intracerebral haemorrhage (ICH, 72), experimental autoimmune encephalomyelitis (EAE, 1029), myocardial infarction (MI, 69), and spinal cord injury (SCI, 185) identified in the context of systematic reviews. Vertical error bars represent the 95% confidence intervals, and the horizontal grey bar represents the 95% confidence interval of the overall estimate (S2 Data).

OPEN ACCESS Freely available online PLOS BIOLOGY

Publication Bias in Reports of Animal Stroke Studies Leads to Major Overstatement of Efficacy

Emily S. Sena[1,2,3], H. Bart van der Worp[4], Philip M. W. Bath[5], David W. Howells[2,3], Malcolm R. Macleod[1,6]*

1 Centre for Clinical Brain Sciences, University of Edinburgh, Edinburgh, United Kingdom, 2 National Stroke Research Institute, Austin Health, University of Melbourne, Melbourne, Victoria, Australia, 3 Department of Medicine, Austin Health, University of Melbourne, Melbourne, Victoria, Australia, 4 Department of Neurology, Rudolf Magnus Institute of Neuroscience, University Medical Center, Utrecht, The Netherlands, 5 Stroke Trials Unit, University of Nottingham, Nottingham, England, United Kingdom, 6 Department of Neurology, NHS Forth Valley, Stirling, Scotland, United Kingdom

Abstract

The consolidation of scientific knowledge proceeds through the interpretation and then distillation of data presented in research reports, first in review articles and then in textbooks and undergraduate courses, until truths become accepted as such both amongst "experts" and in the public understanding. Where data are collected but remain unpublished, they cannot contribute to this distillation of knowledge. If these unpublished data differ substantially from published work, conclusions may not reflect adequately the underlying biological effects being described. The existence and any impact of such "publication bias" in the laboratory sciences have not been described. Using the CAMARADES (Collaborative Approach to Meta-analysis and Review of Animal Data in Experimental Studies) database we identified 16 systematic reviews of interventions tested in animal studies of acute ischaemic stroke involving 525 unique publications. Only ten publications (2%) reported no significant effects on infarct volume and only six (1.2%) did not report at least one significant finding. Egger regression and trim-and-fill analysis suggested that publication bias was highly prevalent (present in the literature for 16 and ten interventions, respectively) in animal studies modelling stroke. Trim-and-fill analysis suggested that publication bias might account for around one-third of the efficacy reported in systematic reviews, with reported efficacy falling from 31.3% to 23.8% after adjustment for publication bias. We estimate that a further 214 experiments (in addition to the 1,359 identified through rigorous systematic reviews; non publication rate 14%) have been conducted but not reported. It is probable that publication bias has an important impact in other animal disease models, and more broadly in the life sciences.

Of 525 unique publications involving 1,359 experiments: 31% overestimate efficacy; 16% experiments remain unpublished; 2% of publications reported no significant treatment effects

http://compare-trials.org/

67 TRIALS CHECKED TO DATE

9 TRIALS WERE PERFECT

301 OUTCOMES NOT REPORTED

357 NEW OUTCOMES SILENTLY ADDED

)n average, each trial reported just 62.0% of its specified outcomes. And on average, each trial ilently added 5.3 new outcomes.

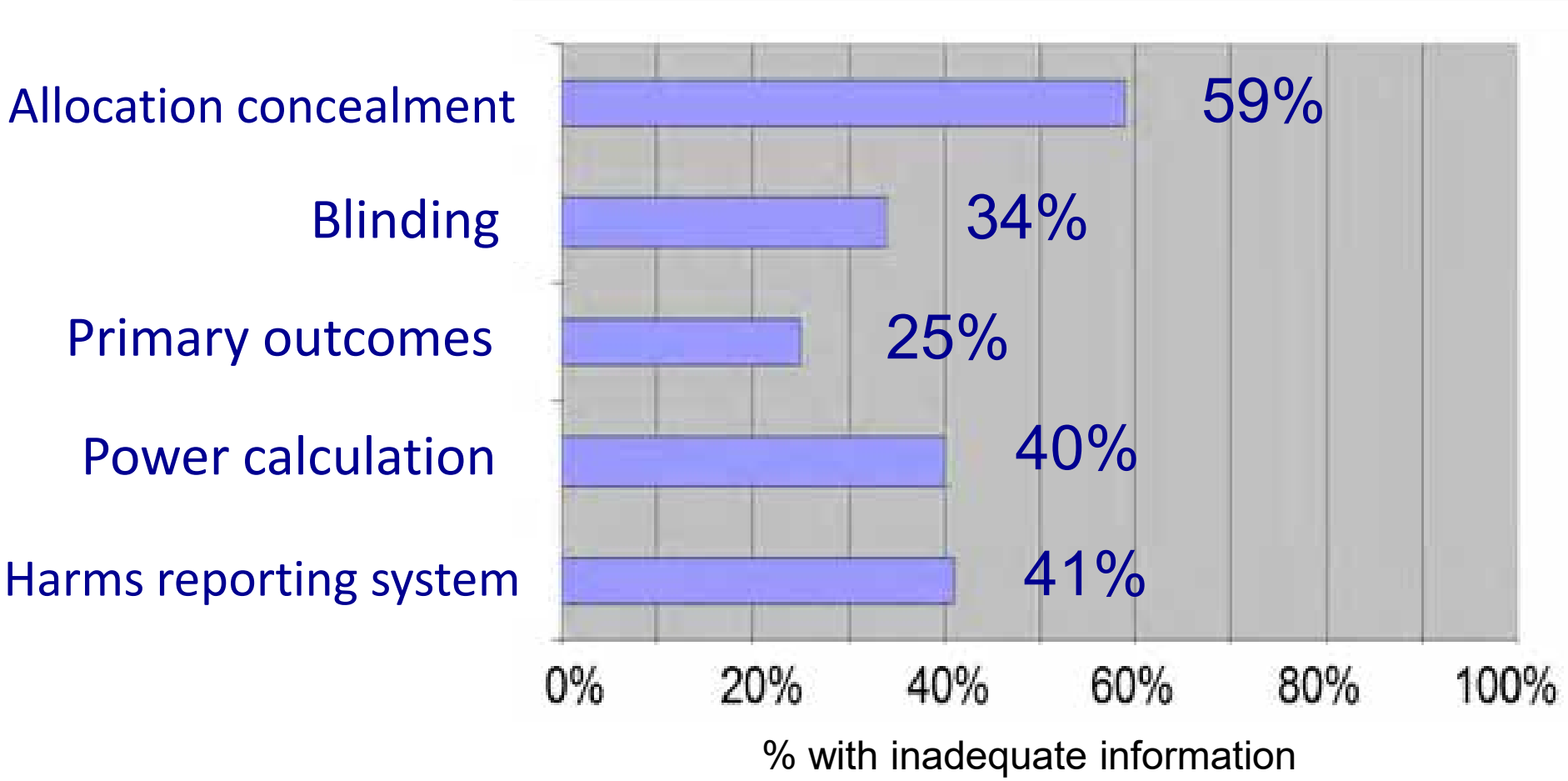
58 LETTERS SENT

6 LETTERS PUBLISHED

31 LETTERS UNPUBLISHED AFTER 4 WEEKS

16 LETTERS REJECTED BY EDITOR

Protocols lack important information



Mhaskar R et al, J Clin Epid 2012; Chan AW et al, BMJ 2008, JAMA 2004; Scharf O, J Clin Oncol 2006; Pildal J, BMJ 2005; Hróbjartsson A et al, J Clin Epid 2009

ALL HAVE PASSED PEER REVIEW AND EDITORIAL APPROVAL

Expenditures on biomedical research

The Anatomy of Medical Research
US and International Comparisons

Industry Breakout - Life Sciences

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Summary

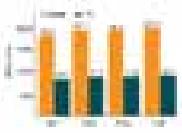
As represented in this Forecast, the life science industry includes biopharmaceuticals, medical instruments and devices, animal/agricultural bioscience and commercial research and testing. However, the industry's R&D spending is driven primarily by the mass and research intensity of the biopharmaceutical sector, which accounts for nearly 85% of all expenditures.

The life science industry's research activities in the United States continue to lead the world, but it is an area that also remains in significant transition. Not only is life science—led by the biopharmaceutical sector—the leading U.S. industry in terms of volume of research, U.S. life science R&D accounts for 46% of the global total—one of the highest shares in any industry.

Still, pressures persist to improve on productivity, product pipelines and ROI in consideration of expiring patents, cost pressures and the rising complexity of innovation in drug development. While primarily affecting the biopharmaceutical sector, the medical device sector is not immune to some of these trends. A new factor complicating the R&D environment for the life science industry is the set of changes in the U.S. healthcare landscape mandated by the Affordable Care Act. While it is hard to predict exactly how this new law will affect life science R&D, these transitions and uncertainties suggest that while the U.S. remains a global leader life science R&D, it is vulnerable, especially as European competitors and new, emerging Asian competitors target life science research for growth.

For the U.S. life science industry, we project a small rebound over 2013 levels (up 2.2%) to R&D spending of about $93 billion in 2014, with the growth coming primarily from smaller biopharmaceutical innovators and medical device manufacturers.

The global expansion of the life science industry has slowed over the last few years, but the industry is forecast to have a stronger recovery (up 3.1%) to more than $201 billion in 2014.



Regulatory Context Influences U.S. R&D Outlook

The U.S. life science industry emerged from the combined challenges of the recession and patent expirations with fresh strategies for R&D. Traditional pharmaceutical companies, while still massive and investing significant resources in R&D, continue to struggle with reduced product pipelines and productivity from discovery through development. As these firms rationalize drug development activities, R&D spending often declines and programs are sometimes reduced and refocused. Smaller

Actions to increase the value of research

INTERNATIONAL CONGRESS ON
Peer Review and Biomedical Publication

SEARCH

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Previous Congresses

Sixth International Congress on Peer Review and Biomedical Publication
The Sixth International Congress on Peer Review and Biomedical Publication was held September 10-12, 2009, in Vancouver, BC, Canada. As with the previous Congresses, our aim was to improve the quality and credibility of biomedical peer review and publication and to help advance the efficiency, effectiveness, and equitability of the dissemination of biomedical information throughout the world. Four hundred twenty-four participants from 32 countries attended the Congress.

Previous Peer Review Congress Programs and Abstracts
Sixth Congress held September 2009 in Vancouver
Fifth Congress held September 2005 in Chicago
Fourth Congress held September 2001 in Barcelona
Third Congress held September 1997 in Prague

JAMA Peer Review Theme Issues
Containing abstracts and articles from the Fourth, Third, and Second Peer Review Congresses.

June 5, 2002 Issue
July 15, 1998 Issue
July 12, 1994 Issue

Photo courtesy of Ted Grudzinski

International Congress on
Peer Review and Scientific Publication

Enhancing the quality and credibility of science

September 10-12, 2017 | Chicago, USA

2017 International Peer Review Congress

September 10-12, 2017
Swissotel, Chicago, Illinois, USA

Our aim is to encourage research into the quality and credibility of peer review and scientific publication, to establish the evidence base on which scientists can improve the conduct, reporting, and dissemination of scientific research.

Announcement: Call for Research Abstracts
If you haven't already started your research, now is the time! Abstracts are due February 15, 2017. The abstract submission site will be open in December 2016.

Sponsor and Exhibitor Opportunities are now available.

What's the best way to get the latest updates from the Peer Review Congress?

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NEWS
COPE Digest: Publication Ethics in Practice. January 2015 (Vol. 3, Issue 1)
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NEWS
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19th Jan 2015
CASE
Possible omission of information essential for conclusions in a...
19th Jan 2015
CASE
Institutional review board approval required?
19th Jan 2015
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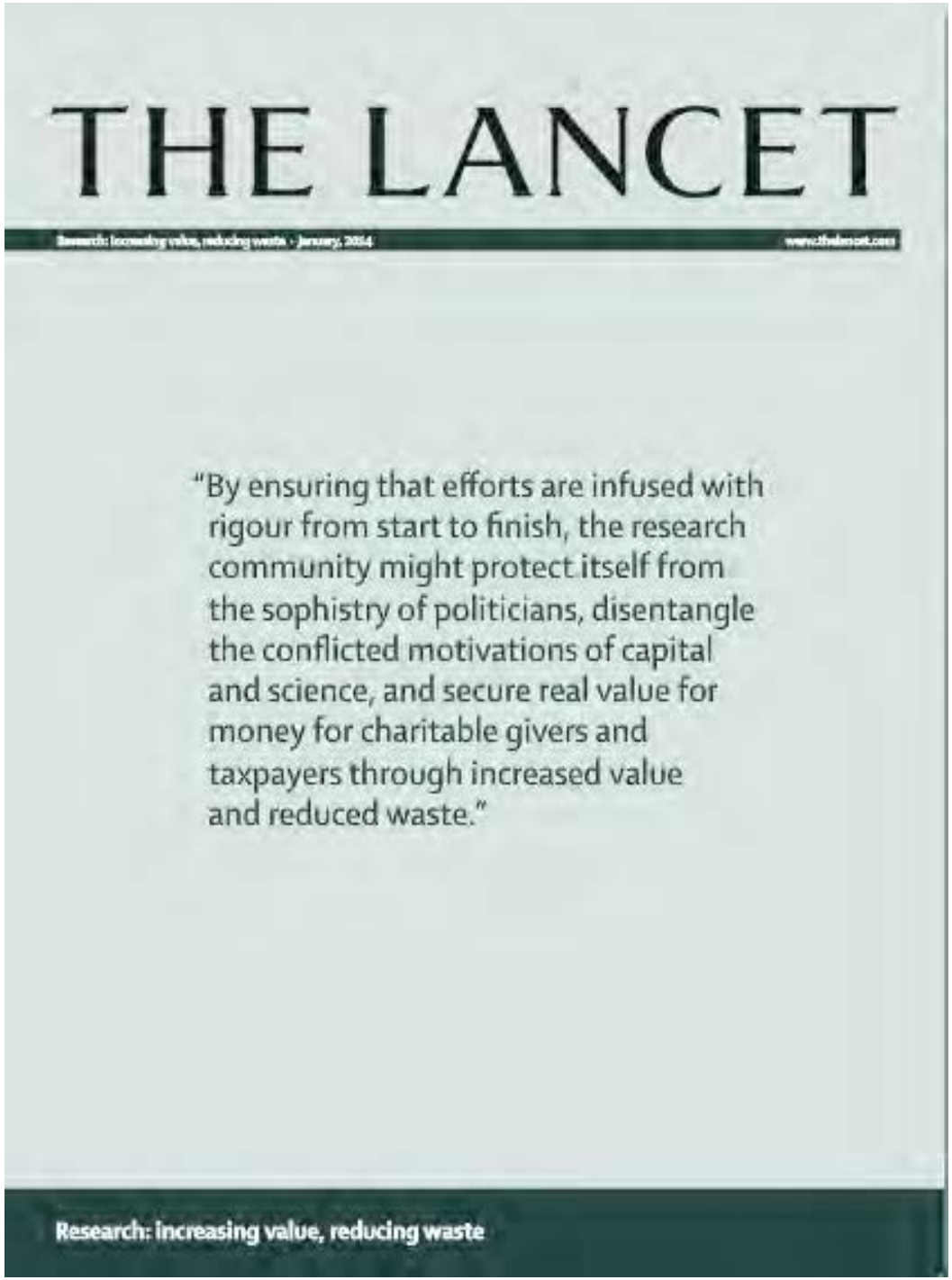


"Our belief is that research funders, scientific societies, school and university teachers, professional medical associations, and scientific publishers (and their editors) can use this Series as an opportunity to examine more forensically why they are doing what they do...and whether they are getting the most value for the time and money invested in science."

Lancet series (2014) increasing value, reducing waste

- 7 articles
- 42 authors
- > 50 journal pages
- Several hundred references citing problems (and evidence) in the entire research process
  - From questions asked to how research is reported
- Clinical and preclinical research

http://researchwaste.net/

http://www.thelancet.com/campaigns/efficiency

REWARD - Reduce research waste and reward diligence

Increasing value, reducing waste

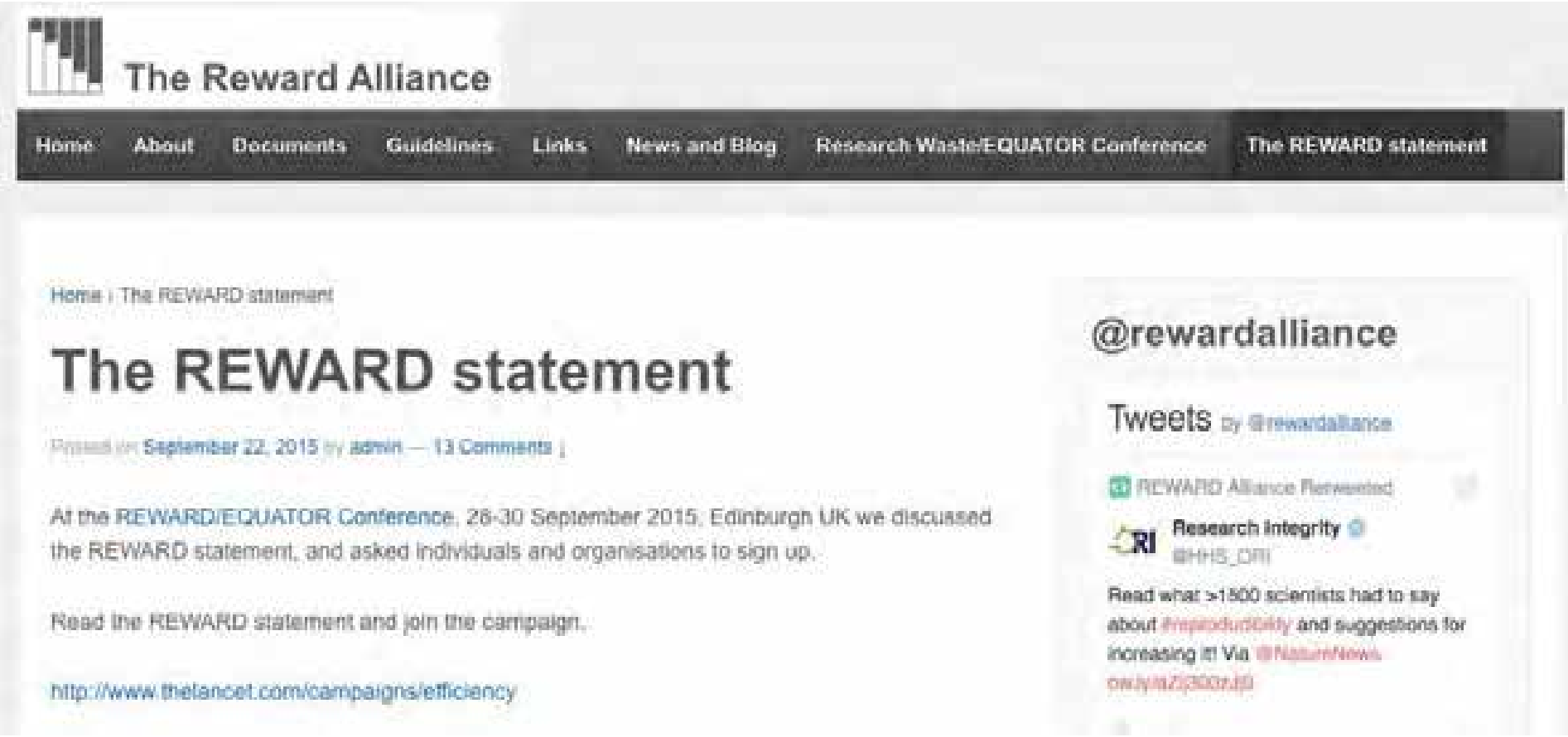
- Series has 17 recommendations
- Targeted:
  - funders, government, journals, academic institutions, regulators, and researchers

Recommendations and monitoring

- Recommendation (3)
  - institutions and funders should adopt performance metrics that recognise full dissemination of research and reuse of original datasets by external researchers
- Monitor
  - assessment of the proportion of institutional and funding-agency policies that explicitly reward dissemination of study protocols, reports, and participant-level data
- Groups affected
  - HIRO, Altmetric, U15, CIHR, other national/regional funders

Recommendations and monitoring

- Recommendation (5)
  - Make publicly available the full protocols, analysis plans or sequence of analytical choices, and raw data for all designed and undertaken biomedical research
- Monitoring
  - Proportion of reported studies with publicly available (ideally preregistered) protocol and analysis plans, and proportion with raw data and analytical algorithms publicly available within 6 months after publication of a study report
- Groups affected
  - HIRO, PROSPERO, PRISMA-P, SPIRIT, clinicaltrials.gov, ISRCTN, WHO platform



https://www.youtube.com/watch?v=K0wyc5w6bQE&feature=youtu.be

“WE RECOGNISE THAT, WHILE WE STRIVE FOR EXCELLENCE IN RESEARCH, THERE IS MUCH THAT NEEDS TO BE DONE TO REDUCE WASTE AND INCREASE THE VALUE OF OUR CONTRIBUTIONS. WE MAXIMISE OUR RESEARCH POTENTIAL WHEN:

- **WE SET THE RIGHT RESEARCH PRIORITIES;**
- **WE USE ROBUST RESEARCH DESIGN, CONDUCT AND ANALYSIS;**
- **REGULATION AND MANAGEMENT ARE PROPORTIONATE TO RISKS;**
- **ALL INFORMATION ON RESEARCH METHODS AND FINDINGS ARE ACCESSIBLE;**
- **REPORTS OF RESEARCH ARE COMPLETE AND USABLE.**

WE BELIEVE WE HAVE A RESPONSIBILITY NOT JUST TO SEEK TO ADVANCE KNOWLEDGE, BUT ALSO TO ADVANCE THE PRACTICE OF RESEARCH ITSELF. THIS WILL CONTRIBUTE TO IMPROVEMENT IN THE HEALTH AND LIVES OF ALL PEOPLES, EVERYWHERE. AS FUNDERS, REGULATORS, COMMERCIAL ORGANISATIONS, PUBLISHERS, EDITORS, RESEARCHERS, RESEARCH USERS AND OTHERS – WE COMMIT TO PLAYING OUR PART IN INCREASING VALUE AND REDUCING WASTE IN RESEARCH.”

Strategies to increase the value of research

Avoidable waste of research related to inadequate methods in clinical trials

Youri Yordanov,[1,2] Agnes Dechartres,[1,3,4] Raphaël Porcher,[1,3,4] Isabelle Boutron,[1,3,4,5] Douglas G Altman,[6] Philippe Ravaud[1,3,4,5,7]

ABSTRACT

OBJECTIVE

To assess the waste of research related to inadequate methods in trials included in Cochrane reviews and to examine to what extent this waste could be avoided. A secondary objective was to perform a simulation study to re-estimate this avoidable waste if all trials were adequately reported.

DESIGN

Methodological review and simulation study.

DATA SOURCES

Trials included in the meta-analysis of the primary outcome of Cochrane reviews published between April 2012 and March 2013.

DATA EXTRACTION AND SYNTHESIS

We collected the risk of bias assessment made by the review authors for each trial. For a random sample of 200 trials with at least one domain at high risk of bias, we re-assessed risk of bias and identified all related methodological problems. For each problem, possible adjustments were proposed that were then validated by an expert panel also evaluating their feasibility (easy or not) and cost. Avoidable waste was defined as trials with at least one domain at high risk of bias for which easy adjustments with no or minor cost could change all domains to low risk. In the simulation study, after extrapolating our re-assessment of risk of bias to all trials, we considered each domain rated as unclear risk of bias as missing data and used multiple imputations to determine whether they were at high or low risk.

RESULTS

Of 1286 trials from 205 meta-analyses, 556 (43%) had at least one domain at high risk of bias. Among the sample of 200 of these trials, 142 were confirmed as high risk; in these, we identified 25 types of methodological problem. Adjustments were possible in 136 trials (96%). Easy adjustments with no or minor cost could be applied in 71 trials (50%), resulting in 17 trials (12%) changing to low risk for all domains. So the avoidable waste represented 12% (95% CI 7% to 18%) of trials with at least one domain at high risk. After correcting for incomplete reporting, avoidable waste due to inadequate methods was estimated at 42% (95% CI 36% to 49%).

CONCLUSIONS

An important burden of wasted research is related to inadequate methods. This waste could be partly avoided by simple and inexpensive adjustments.

Introduction

In 2009, Chalmers and Glasziou raised an important concern about the extent of research that is wasted, estimating the loss to be as much as 85% of research investment.[1] This waste concerns all types of research and occurs at all stages of the production of research evidence, from the choice of questions that are not relevant to patients and their physicians to under-reporting of trial methods and results.[1-8] Such a situation is ethically, scientifically, and economically indefensible.[9,10] It necessitates rethinking the whole system of clinical research to increase the value of research and reduce waste, as recently outlined in a series in the *Lancet*.[1,7]

A large part of waste is related to inadequate methods.[1,6] Flaws in design, conduct, and analysis can bias results of randomised controlled trials (RCTs) and the systematic reviews that include them, thus leading to potentially erroneous conclusions[5] with serious consequences for patients. Empirical evidence found exaggerated estimates of intervention effect in trials with

Low technology solutions to writing research

RESEARCH ARTICLE Open Access

Impact of an online writing aid tool for writing a randomized trial report: the COBWEB (Consort-based WEB tool) randomized controlled trial

Caroline Barnes[2,3], Isabelle Boutron[1,2,3*], Bruno Giraudeau[3,4], Raphael Porcher[1,2,3], Douglas G Altman[5] and Philippe Ravaud[1,2,3,6]

Abstract

Background: Incomplete reporting is a frequent waste in research. Our aim was to evaluate the impact of a writing aid tool (WAT) based on the CONSORT statement and its extension for non-pharmacologic treatments on the completeness of reporting of randomized controlled trials (RCTs).

Methods: We performed a 'split-manuscript' RCT with blinded outcome assessment. Participants were masters and doctoral students in public health. They were asked to write, over a 4-hour period, the methods section of a manuscript based on a real RCT protocol, with a different protocol provided to each participant. Methods sections were divided into six different domains: 'trial design', 'randomization', 'blinding', 'participants', 'interventions', and 'outcomes'. Participants had to draft all six domains with access to the WAT for a random three of six domains. The random sequence was computer-generated and concealed. For each domain, the WAT comprised reminders of the corresponding CONSORT item(s), bullet points detailing all the key elements to be reported, and examples of good reporting. The control intervention consisted of no reminders. The primary outcome was the mean global score for completeness of reporting (scale 0–10) for all domains written with or without the WAT.

Results: Forty-one participants wrote 41 different manuscripts of RCT methods sections, corresponding to 246

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META-RESEARCH ARTICLE

Badges to Acknowledge Open Practices: A Simple, Low-Cost, Effective Method for Increasing Transparency

Mallory C. Kidwell[1]*, Ljiljana B. Lazarević[2], Erica Baranski[3], Tom E. Hardwicke[4], Sarah Piechowski[5], Lina-Sophia Falkenberg[5], Curtis Kennett[6], Agnieszka Slowik[7], Carina Sonnleitner[7], Chelsey Hess-Holden[6], Timothy M. Errington[1], Susann Fiedler[5], Brian A. Nosek[1,8]

1 Center for Open Science, Charlottesville, Virginia, United States of America, **2** University of Belgrade, Belgrade, Serbia, **3** University of California, Riverside, Riverside, California, United States of America, **4** University College London, London, United Kingdom, **5** Max Planck Institute for Research on Collective Goods, Bonn, Germany, **6** Mississippi State University, Starkville, Mississippi, United States of America, **7** University of Vienna, Vienna, Austria, **8** University of Virginia, Charlottesville, Virginia, United States of America

* Mallory@cos.io; Mallory.Kidwell@utah.edu

OPEN ACCESS

Citation: Kidwell MC, Lazarević LB, Baranski E, Hardwicke TE, Piechowski S, Falkenberg L-S, et al.

Abstract

Psychological SCIENCE
A Journal of the Association for Psychological Science

Table of Contents

September 2016; 27 (9)

Research Articles

COMMENTARY | OPEN ACCESS

Bioboxes: standardised containers for interchangeable bioinformatics software

Peter Belmann, Johannes Dröge, Andreas Bremges, Alice C. McHardy, Alexander Sczyrba and Michael D. Barton ✉

GigaScience 2015 4:47 | DOI: 10.1186/s13742-015-0087-0 | © Belmann et al. 2015

Received: 10 August 2015 | Accepted: 29 September 2015 | Published: 15 October 2015

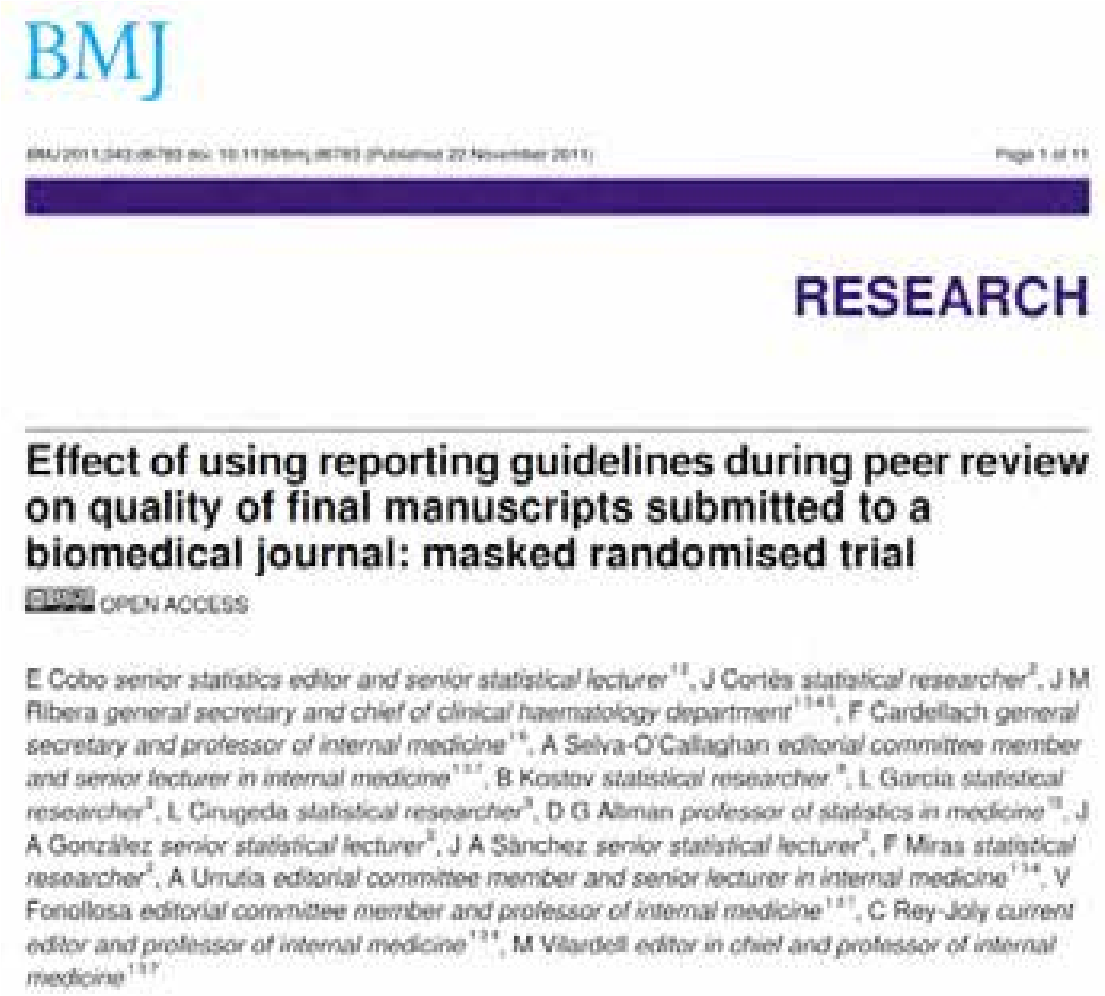
Back to article

Open Badges

How to use reporting guidelines optimally

www

Are reporting guidelines effective?



BMJ

BMJ 2011;343:d6783 doi: 10.1136/bmj.d6783 (Published 22 November 2011) Page 1 of 11

RESEARCH

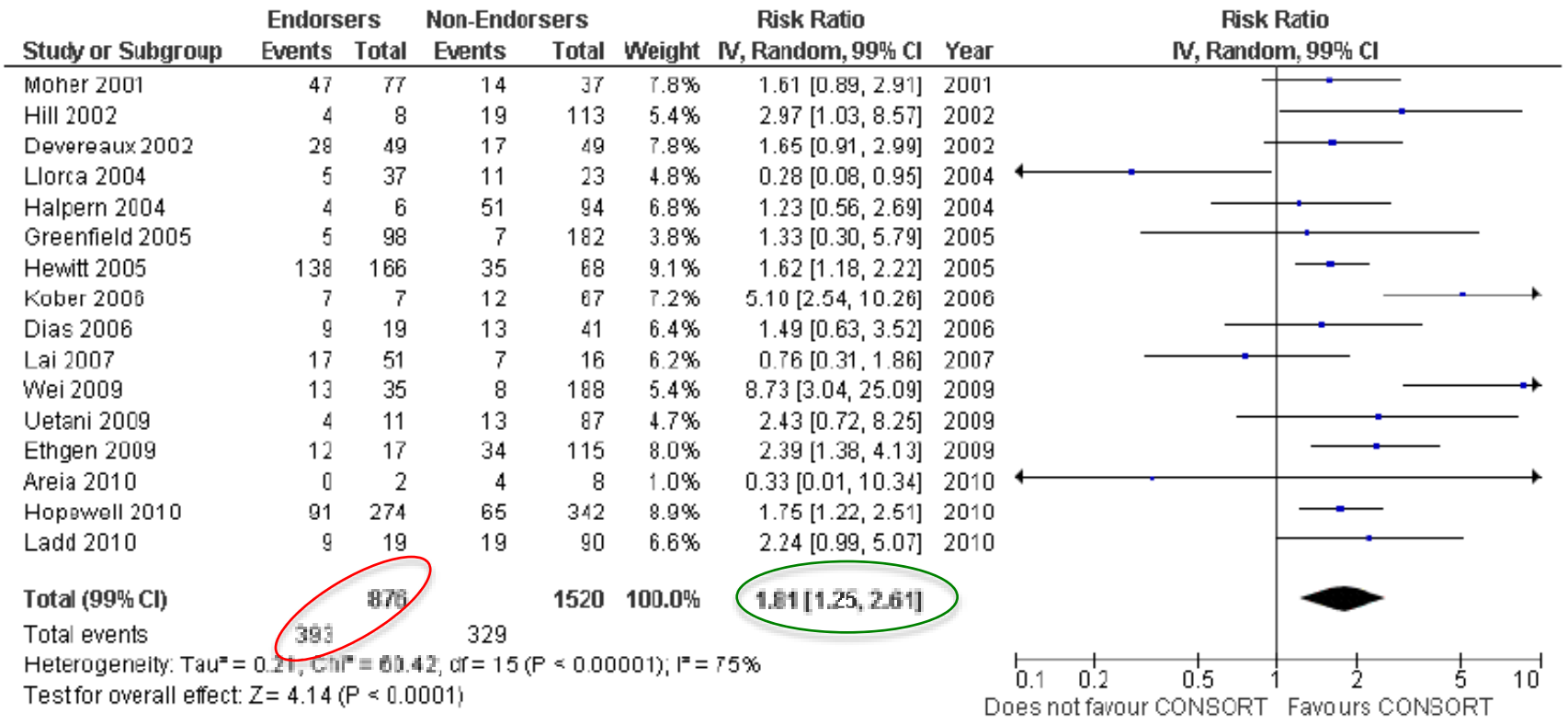
Effect of using reporting guidelines during peer review on quality of final manuscripts submitted to a biomedical journal: masked randomised trial

OPEN ACCESS

E Cobo senior statistics editor and senior statistical lecturer[1], J Cortés statistical researcher[2], J M Ribera general secretary and chief of clinical haematology department[1,3,4], F Cardellach general secretary and professor of internal medicine[1,5], A Selva-O'Callaghan editorial committee member and senior lecturer in internal medicine[1,6,7], B Kostov statistical researcher[8], L García statistical researcher[2], L Cirugeda statistical researcher[9], D G Altman professor of statistics in medicine[10], J A González senior statistical lecturer[2], J A Sánchez senior statistical lecturer[2], F Miras statistical researcher[2], A Urrutia editorial committee member and senior lecturer in internal medicine[1,3,4], V Fonollosa editorial committee member and professor of internal medicine[1,4,7], C Rey-Joly current editor and professor of internal medicine[1,3,4], M Vilardell editor in chief and professor of internal medicine[1,3,7]

Allocation concealment

Figure 5. Forest plot of comparison: 1 CONSORT-endorsing journals versus CONSORT non-endorsing journals, outcome: 1.9 Allocation concealment.

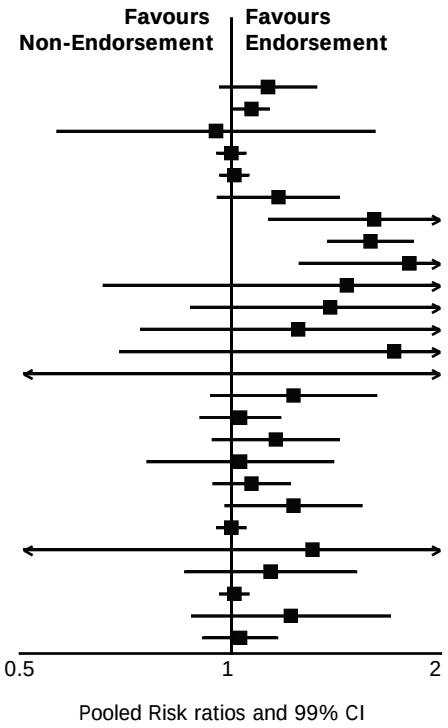


Relative vs. absolute? Only 393/867 (45%) completeness within endorsers

Turner et al. Sys Revs 2012; 1(1):60

Endorsers versus non-endorsers

CONSORT Checklist Item	# of Evaluations	# of RCTs	RR	99% CI
Title and Abstract	7	1,233	1.13	(0.96, 1.33)
Introduction	5	513	1.07	(1.01, 1.14)
Participants	6	683	0.95	(0.56, 1.62)
Interventions	6	638	1.00	(0.95, 1.05)
Objectives	5	540	1.01	(0.96, 1.06)
Outcomes	8	1,302	1.17	(0.95, 1.44)
Sample Size	11	1,843	1.61	(1.13, 2.29)
Sequence Generation	14	2,231	1.59	(1.38, 1.84)
Allocation Concealment	16	2,396	1.81	(1.25, 2.62)
Implementation	5	498	1.47	(0.65, 3.32)
Blinding of Paticipants	5	711	1.39	(0.87, 2.22)
Blinding of Intervention	5	710	1.25	(0.74, 2.12)
Blinding of Outcome Assessor	5	719	1.72	(0.69, 4.30)
Blinding of Data Analyst	3	497	3.56	(0.40, 31.8)
Blinding Any description	8	1,851	1.23	(0.93, 1.62)
Statistical Methods	9	894	1.03	(0.90, 1.18)
Participant Flow	16	2,461	1.16	(0.94, 1.44)
Recruitment	6	959	1.03	(0.75, 1.41)
Baseline Data	5	529	1.07	(0.94, 1.22)
Numbers Analysed	13	2,145	1.23	(0.98, 1.55)
Outcomes and Estimation	6	617	1.00	(0.95, 1.05
Ancillary Analyses	4	378	1.31	(0.48, 3.58)
Adverse Events	8	911	1.14	(0.86, 1.52)
Interpretation	5	540	1.01	(0.96, 1.06)
Generalisability	5	540	1.22	(0.88, 1.70)
Overall Evidence	4	317	1.03	(0.91, 1.17)



Turner et al. Sys Revs 2012; 1(1):60

PLOS | MEDICINE

ESSAY

Four Proposals to Help Improve the Medical Research Literature

David Moher[1]*, **Douglas G. Altman**[2]

1 Clinical Epidemiology Program, Ottawa Hospital Research Institute; School of Epidemiology, Public Health and Preventive Medicine, Faculty of Medicine, University of Ottawa, Ottawa, Ontario, Canada, 2 Centre for Statistics in Medicine, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Oxford, United Kingdom

* dmoher@ohri.ca

CMAJ COMMENTARY

Report on a pilot project to introduce a publications officer

Kelly D. Cobey PhD MRes, James Galipeau PhD MA, Larissa Shamseer MSc BSc, David Moher PhD MSc

Competing interests: Kelly Cobey is the publications officer at the Ottawa Hospital Research Institute. [AU1: Dr. Moher has not completed his

Is data sharing associated with added value?

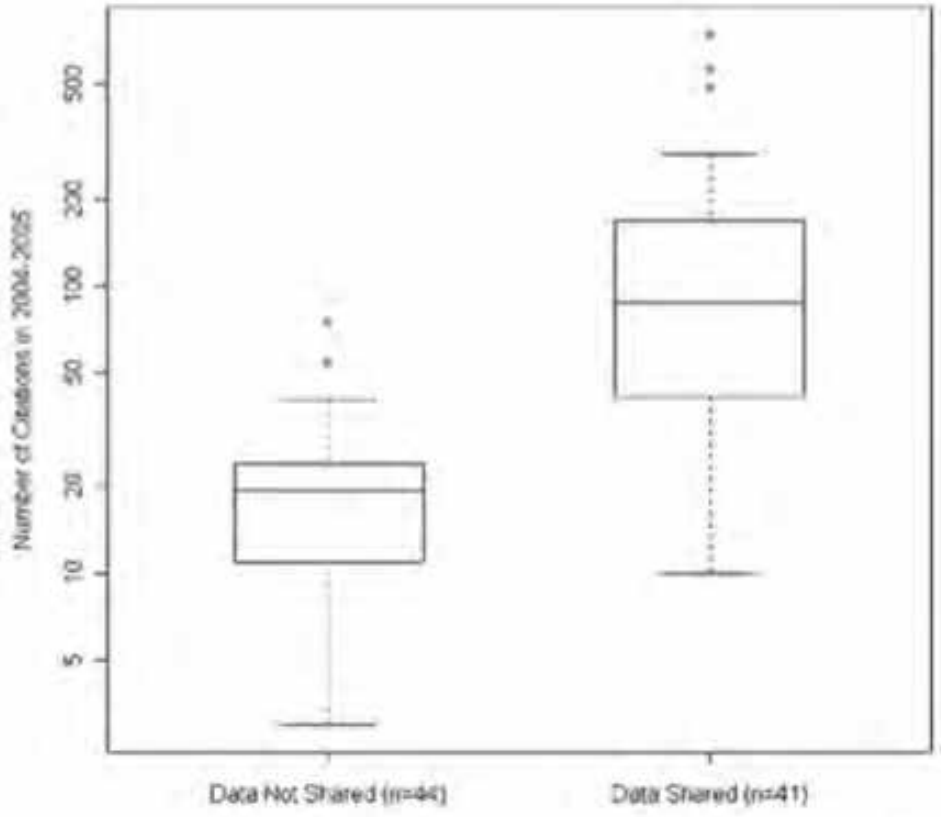


Figure 1. Distribution of 2004–2005 citation counts of 85 trials by data availability. The 41 clinical trial publications which publicly shared their microarray data received more citations, in general, than the 44 publications which did not share their microarray data. In this plot of the distribution of citation counts received by each publication, the extent of the box encompasses the interquartile range of the citation counts, whiskers extend to 1.5 times the interquartile range, and lines within the boxes represent medians.

Piwowar HA, Day RS, Fridsma DB (2007) Sharing Detailed Research Data Is Associated with Increased Citation Rate. PLoS ONE 2(3): e308.

Avoid submissions to predatory journals

'Predatory' open access: a longitudinal study of article volumes and market characteristics

Cenyu Shen* and Bo-Christer Björk

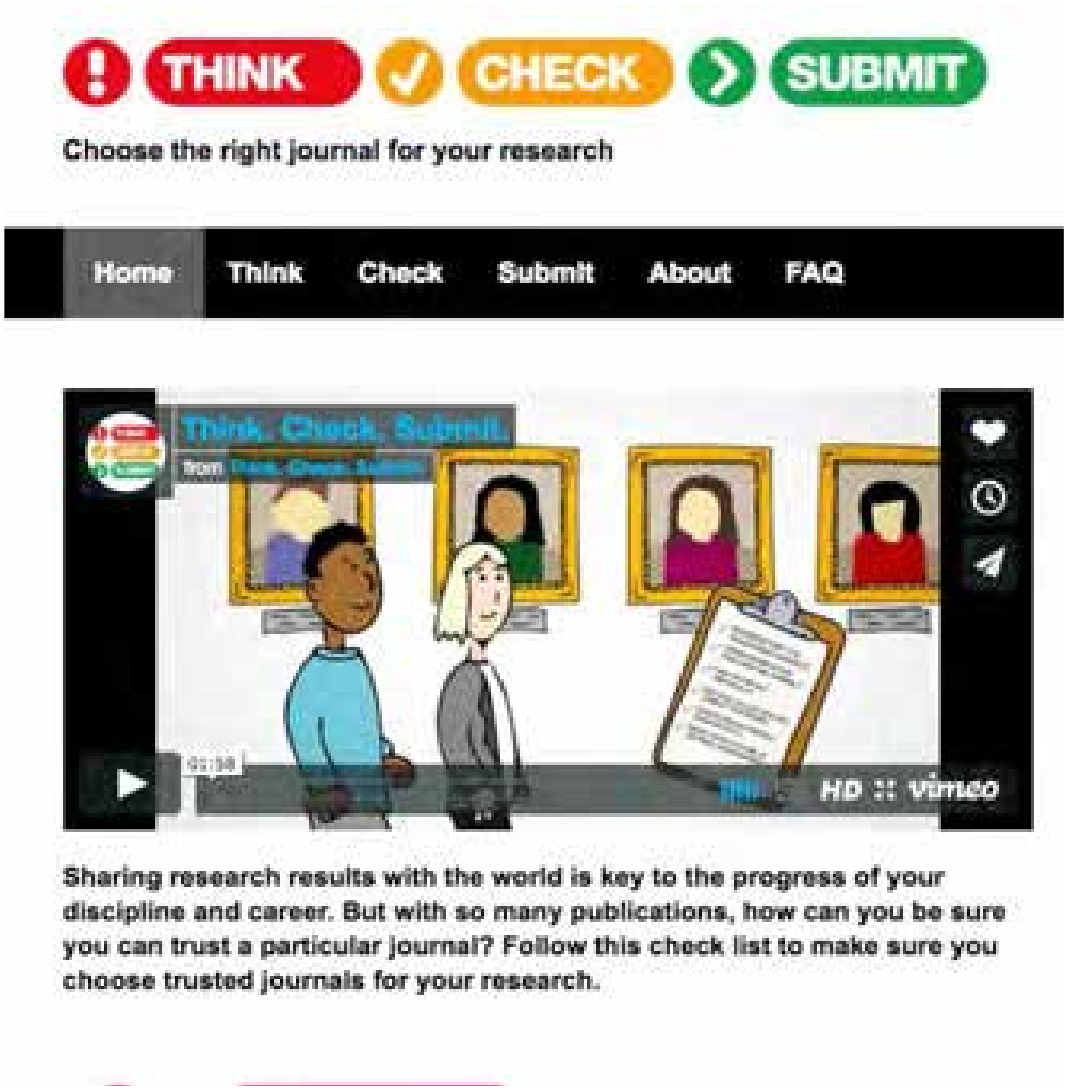
Abstract

Background: A negative consequence of the rapid growth of scholarly open access publishing funded by article processing charges is the emergence of publishers and journals with highly questionable marketing and peer review practices. These so-called predatory publishers are causing unfounded negative publicity for open access publishing in general. Reports about this branch of e-business have so far mainly concentrated on exposing lacking peer review and scandals involving publishers and journals. There is a lack of comprehensive studies about several aspects of this phenomenon, including extent and regional distribution.

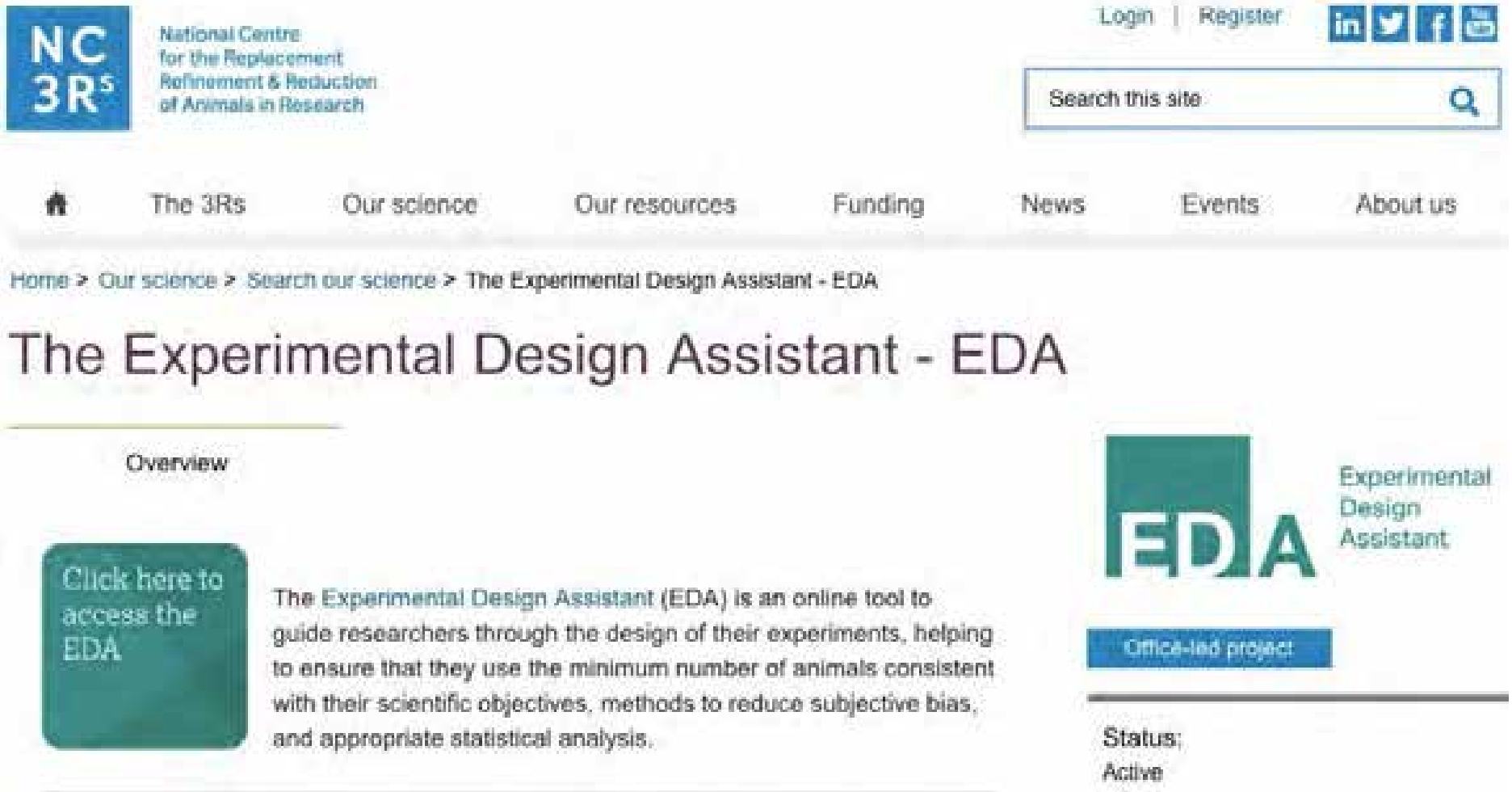
Methods: After an initial scan of all predatory publishers and journals included in the so-called Beall's list, a sample of 613 journals was constructed using a stratified sampling method from the total of over 11,000 journals identified. Information about the subject field, country of publisher, article processing charge and article volumes published between 2010 and 2014 were manually collected from the journal websites. For a subset of journals, individual articles were sampled in order to study the country affiliation of authors and the publication delays.

Results: Over the studied period, predatory journals have rapidly increased their publication volumes from 53,000 in 2010 to an estimated 420,000 articles in 2014, published by around 8,000 active journals. Early on, publishers with more than 100 journals dominated the market, but since 2012 publishers in the 10–99 journal size category have captured the largest market share. The regional distribution of both the publisher's country and authorship is highly

http://thinkchecksubmit.org/



Experimental design assistant: https://eda.nc3rs.org.uk/



We need lots more evaluations, ideally randomized trials

- [P]roductivity [Q]uality of scientific work [R]eproducibility of scientific work [S]haring of data and other resources [T]ranslational influence of research
- Transparency pledge; [T]ransparency and [O]penness [P]romotion Guidelines

The Journal of Clinical Investigation

Dishonesty in scientific research

Nina Mazar[1] and Dan Ariely[2]

[1]Rotman School of Management, University of Toronto, Toronto, Ontario, Canada. [2]Center for Advanced Hindsight, Duke University, Durham, North Carolina, USA.

Fraudulent business practices, such as those leading to the Enron scandal and the conviction of Bernard Madoff, evoke a strong sense of public outrage. But fraudulent or dishonest actions are not exclusive to the realm

ditions, participants "solve" more matrixes in the conflict-of-interest condition — evidence for dishonesty. Interestingly, however, despite theoretically being able to claim having solved all 20 matrixes and

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- [P]roductivity [Q]uality of scientific work [R]eproducibility of scientific work [S]haring of data and other resources [T]ranslational influence of research
- Transparency pledge; [T]ransparency and [O]penness [P]romotion Guidelines
- Open data and Open materials badges
- Peer review
- Reporting guidelines
- Data sharing
- Open access

Do we need an observatory to monitor change over time?

Review

Increasing value and reducing waste in biomedical research: who's listening?

David Moher, Paul Glasziou, Iain Chalmers, Mona Nasser, Patrick M M Bossuyt, Daniel A Korevaar, Ian D Graham, Philippe Ravaud, Isabelle Boutron

The biomedical research complex has been estimated to consume almost a quarter of a trillion US dollars every year. Unfortunately, evidence suggests that a high proportion of this sum is avoidably wasted. In 2014, *The Lancet* published a series of five reviews showing how dividends from the investment in research might be increased from the relevance and priorities of the questions being asked, to how the research is designed, conducted, and reported. 17 recommendations were addressed to five main stakeholders—funders, regulators, journals, academic institutions, and researchers. This Review provides some initial observations on the possible effects of the Series, which seems to have provoked several important discussions and is on the agendas of several key players. Some examples of individual initiatives show ways to reduce waste and increase value in biomedical research. This momentum will probably move strongly across stakeholder groups, if collaborative relationships evolve between key players; further important work is needed to increase research value. A forthcoming meeting in Edinburgh, UK, will provide an initial forum within which to foster the collaboration needed.

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Methods in Research on Research

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