

Publication and related biases in health services and delivery research: the dog that did not bark?

Yen-Fu Chen¹, Kaveh G Shojania², Russell Mannion³, Fujian Song⁴, Timothy P Hofer⁵, Abimbola A Ayorinde¹, Iestyn Williams³, Magdalena Skrybant⁶, Richard J Lilford¹

¹Warwick Centre for Applied Health Research and Delivery (W-CAHRD), Warwick Medical School, University of Warwick, Coventry, UK.

²Centre for Quality Improvement and Patient Safety (C-QIPs), University of Toronto and Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada.

³Health Services Management Centre, School of Social Policy, University of Birmingham, Birmingham, UK.

⁴Department of Population Health & Primary Care, Norwich Medical School, University of East Anglia, Norwich, UK.

⁵VA Center for Clinical Management Research, Ann Arbor Healthcare System, University of Michigan, Ann Arbor, USA

⁶Institute of Applied Health Research, University of Birmingham, Birmingham, UK.

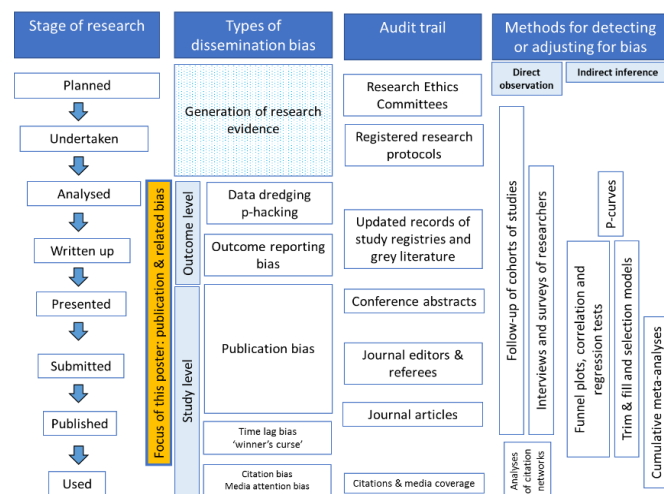
Contact: Y-F.Chen@warwick.ac.uk

Background

- Publication bias occurs when the likelihood of publication depends on a study's outcome
- Publication bias may occur at any point between generation of study data and publication (Figure 1)
- Well-known in biomedical research but not much is published in HSDR
- Publication bias could have implications on decision making related to allocation of scarce service resources and consequently patient outcomes

- Factors that may impede the study of these biases in HSDR include:
 - Methodological heterogeneity and less reliance on randomised trials
 - Grey areas between research and non-research
 - The need typically to examine a large number of variables
 - Assumptions underpinning funnel plots and related methods may often not hold

Figure 1 – definition of publication bias and how it occurs



Aims

- To gather empirical and methodological evidence on publication and related biases in HSDR
- To consider factors that may impede the study of these biases in HSDR
- To discuss the applicability to HSDR of existing approaches to researching publication and related biases
- To consider implications for policy and practice pending further research

Methods

- Scoping review of methodological studies that provide empirical evidence on publication bias in HSDR
- MEDLINE and Google were searched to January 2017 using terms related to:
 - Health services research (including quality improvement, patient safety, health system research, health policy research) AND
 - Publication bias (including dissemination bias, reporting bias and p-hacking)

Results

- Of 1168 records retrieved, four empirical papers examining publication and related biases in HSDR were found (Table 1)

Table 1. Studies which aimed to investigate publication bias in HSDR

| Study (Author, year) | Methods | Main findings |
|--------------------------------------|--|--|
| Ammenwerth & Keizer, 2007 | Survey of health informatics academics | Only half of evaluation studies reported by the responders were published |
| Costa-Font et al., 2013 | Study of the "winner's curse" on the estimated income elasticity of health care and price elasticity of prescription drugs | Multivariate regressions demonstrated that both publication bias and the "winner's curse" (reflected by an independent association between effect size and journal impact factor) influence outcomes |
| Shojania et al., 2006 | A systematic review of 66 controlled trials investigating the effect of quality improvement strategies on glycaemic control in patients with type 2 diabetes | Smaller trials reported significantly greater effects than did larger trials (P=0.004). Significant funnel plot asymmetry was observed (p=0.001). |
| Vawdrey & Hripcsak, 2013 | Follow-up of health informatics trials registered in ClinicalTrials.gov (2000 – 2008) | Trials with positive results were more likely to be published compared with trials with null results (92% [35/38] vs 71% [10/14]) |

Recommendations

- Mandatory registration of studies aiming to make causal inference, explicit requirement for claiming pre-specified analyses
- Creation of a database for pre-registration and information sharing for quality and service improvement efforts

Given the limited information currently available, we are undertaking research to collect further empirical evidence and explore related methodology for detection and mitigation of publication bias in HSDR

Acknowledgement

- This project is funded by the NIHR HS&DR Programme (project number 15/71/06). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health
- We thank members of our Study Steering Committee for their helpful support and guidance



<http://warwick.ac.uk/publicationbias>