

Workshop. 29-31 May 2019, Research Triangle Park, North Carolina, USA

Assuring the Quality of Systematic Reviews Published in Toxicology and Environmental Health Journals

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Organising Committee

Paul Whaley (*Environment International*, Lancaster Environment Centre, EBTC)

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PW conceived the meeting and initial draft of the agenda. The Organising Committee advised on the agenda and suggested participants. The organisers would also like to thank Sebastian Hoffmann (EBTC) for his comments on the draft agenda. Any questions should be directed to Paul Whaley at

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Context

An increasing number of systematic reviews (SRs) are being published in toxicology and environmental health journals. The trend is being driven by increased recognition of the method being the gold standard for evidence synthesis, the high citation rates which SRs attract, and the relative ease (not requiring experimental work) with which secondary research can be undertaken.

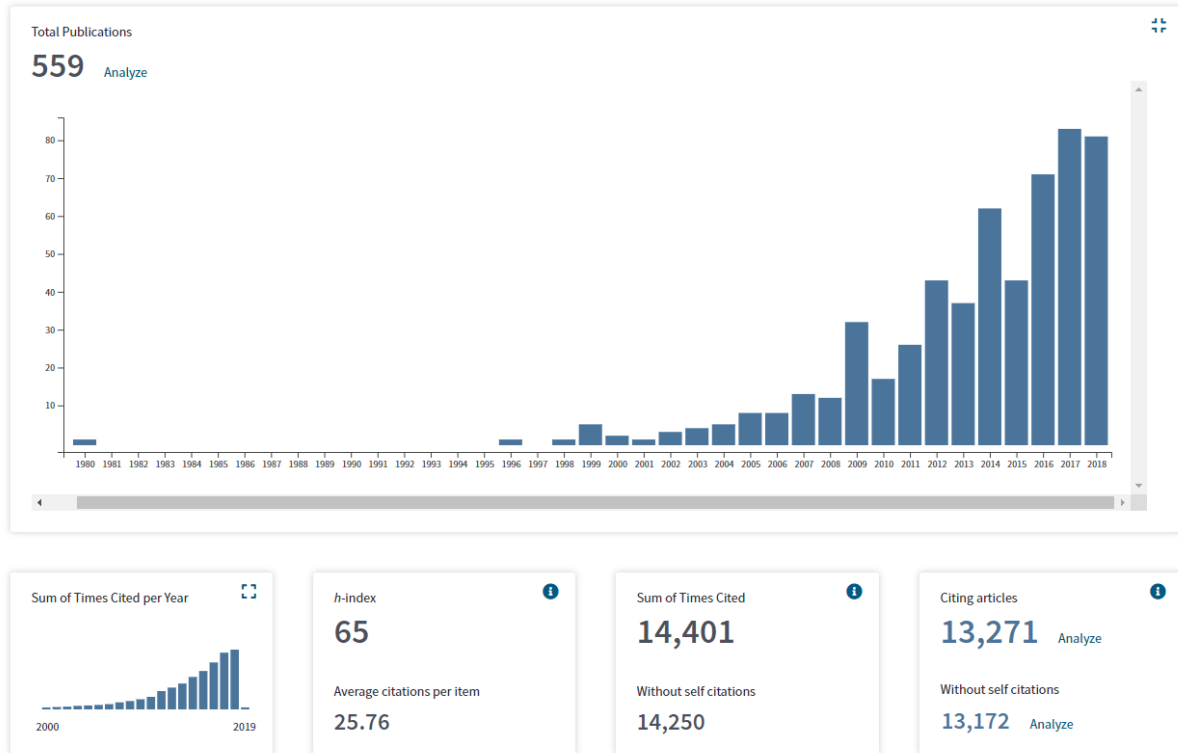


Figure 1: Frequency of publications with the phrase "systematic review" in the title, as indexed by Web of Science in the category "Toxicology" (search date: 6 December 2018)

However, it is not clear that all these reviews should be classified as "systematic" according to widely-accepted definitions and reporting guidelines specific to SR, with shortcomings in one or more steps of the systematic review process. As a result, such reviews may unintentionally be misused in decision making by both researchers and policy-makers. When this occurs, it may lead to distrust and hesitancy to rely on SR in the future, even when a SR is robust and has been conducted according to a scientifically rigorous methodology.

As editors, we control the influx of SRs into the published literature. We set the standards which authors must meet, we have a fundamental role in incentivising the scientific community to employing good practices for conducting research, and we have a responsibility to our readers to ensure (as far as possible) that they are not being misled by the research we publish.

It is therefore desirable for us, as editors of toxicology and environmental health journals, to be proactive in developing and implementing consistent editorial, peer-review and publishing practices which will help ensure that, when we publish SRs, they conform to a basic standard of scientific quality appropriate to the expectations and use of the format.

As editors of journals that also publish primary research, we believe that use of SR methodology will encourage uptake of conduct and reporting guidelines for experimental and observational studies, to facilitate their use in systematic reviews.

Workshop Objectives

The ultimate objective is to develop a joint strategy which will assure the quality of the systematic reviews we, as journals in the environmental health and toxicological sciences, are publishing.

The individual objectives of the workshop are to:

1. **Develop a common understanding of the challenges** we as editors face in ensuring that all published SRs meet an acceptable standard of scientific quality;
2. **Articulate a set of strategic editorial interventions** (actions taken by editors to improve publishing outcomes), which we believe should improve the standard of published SRs;
3. **Identify and commit to approximately five actions** which can be implemented short-term at our journals to immediately improve the standard of published SRs.

(2) does not imply any commitment to specific actions; it is intended as a comprehensive strategy which, if followed, would be considered by the participants as being very likely to make a substantial and lasting difference to the standard of SRs being published by a journal.

(3) is an ideal rather than expected outcome of the workshop, whereby participants will work together to identify a set of actions which they feel they can collectively undertake on a relatively short-term timeline. The hope is that we will be able to agree on approximately five actions and potentially even publish these plans in a joint editorial across multiple journals, in a fashion similar to that for the launch of the PRISMA reporting standard ([see here](#)).

Boundaries: In the interests of a focused discussion which will make a material difference to SR publishing standards, we acknowledge several issues which are of fundamental importance to the publication of high-quality research but are nonetheless not part of the agenda. These are:

- a. Strategies for improving review-type manuscripts which are not systematic reviews
- b. Strategies for improving study reports of primary research
- c. The defining of standards and expectations for conduct and reporting of systematic reviews

(a) and (b) are excluded because they require different interventions, engagement with different research methodologists and audiences, and therefore a different strategy, which would dilute the focus of this event. While agreeing to work on (c) could be an outcome of the workshop, the defining of such standards themselves is not an objective of the workshop – in the same way that agreeing to work on specifications for improved editorial management systems may be a workshop outcome, but actually defining and making those improvements would not be a workshop activity.

General Approach

The workshop will be in the format of an afternoon / full-day / morning meeting for editors of influential environmental health and toxicology journals. The meeting will be designed to provide a forum in which we can discuss the challenges of ensuring that published systematic reviews are of a sufficiently high scientific quality. The workshop will be structured according to major themes in research quality management, providing an organising framework for identifying potential interventions and developing an overall strategy. The meeting will be facilitated to encourage putting forward and prioritising ideas for interventions which will improve publishing standards.

In addition to editors, participation will include five researchers with experience in conducting and publishing environmental health systematic reviews, and five specialists in quality control in

publication of systematic reviews. These experts will be on-hand during our discussions to provide their own experience and insight into measures which could improve publishing standards for SRs, and as a resource which the editors can consult about the range of interventions potentially available to us, their feasibility, and their likely effectiveness.

Planned Outputs

To some extent outputs will be decided at the workshop, determined by the direction in which discussions go. They are currently planned to include:

- **A workshop report:** A summary of the workshop discussion and findings. This will be published in ALTEX, as a condition of workshop sponsorship by t4.
- **A strategy manuscript:** “A strategy for raising the standard of systematic reviews published in environmental health journals”. This would define an agenda for how journal editors can contribute to raising the standards of systematic reviews in the environmental health sciences.
- **An action-plan and joint editorial:** A set of short-term, readily-achievable interventions which everyone can agree to implement, for collaborative improvement of publishing standards for SRs. This could take the form of a co-authored editorial which would be published simultaneously in each participating journal and include immediate actions on at least some of the interventions.
- **A publishing-standards working group:** A group committed to further developing and carrying through the strategic output of the workshop and pursuing the workshop recommendations, and engaging with other journals as well as their reviewers, authors and publishers.

Discussion Themes

The workshop will be arranged around discussion of five themes around which there may be opportunities to work with authors, reviewers and editorial teams in assuring publication of high-quality systematic reviews. The themes are:

#1: Setting standards and providing guidance: how to ensure systematic reviews are fully reported; limitations of reporting guidelines; the difference between enforcement and endorsement; guidance on conducting vs. guidance on reporting SRs; etc.

#2: Preventing mistakes before they happen: creating more opportunities for engagement with researchers prior to submission of problematic manuscripts, e.g. by publishing protocols; results-free publication models such as Registered Reports and their application to SR publishing; etc.

#3: Optimising editorial workflows: getting the most out of peer-review; integrating reporting standards into editorial workflows; editorial competencies and training; etc.

#4: Measuring the efficacy of interventions: conducting observational and randomised studies of the efficacy of editorial interventions intended to improve the quality of published SRs.

Each theme will be discussed in a break-out session. Each breakout session is prefaced by a talk on the relevant theme. The talk will introduce a few key ideas on each theme, which editors could consider implementing in SR handling processes at their journals.

Agenda

To make travel as easy as possible and provide maximum time for networking, thinking and discussion outside the formal hours of the workshop, we are splitting the sessions over three days, starting at lunchtime on 29 May and ending with lunch on 31 May. Detail on the structure of breakout and plenary sessions is provided on the next page. The meeting is being held at the **Hilton Doubletree Hotel, Research Triangle Park**.

Day 1

12:30pm - Buffet lunch and welcome; 1:30pm start

- **Introductory briefing (20 mins):** The dual “gatekeeper and midwife” roles of the editor of seeking to assure the quality of published systematic reviews; aims and approach of the workshop; anticipated outcomes. (Paul Whaley, Lancaster Environment Centre, UK)
- **Context: The quality of published systematic reviews (20 mins)** A survey of current practices in systematic reviews; what is being reported (and what not); implications for the validity of findings of systematic reviews; why are researchers struggling to conduct and report high-quality SRs? (Matthew Page, Monash University, Australia)
- **First Plenary: What are the challenges in publishing high-quality SRs? (30 mins)** Highly interactive, warm-up discussion for editors and SR researchers, where participants respond to how the experience of SR publishing in medicine might be reflected in EH research.

3pm - Coffee break (20 minutes)

- **Talk + Q&A on Theme 1**, by Matthew Page, then breakout, plenary (0.5 hours, 1 hour, 0.5 hours)

6pm - Wrap-up

7pm - Dinner: hot buffet served at venue

Day 2

8am - Breakfast, provided by venue; 8:45am start

- **Talk + Q&A on Theme 2**, by David Mellor (Center for Open Science), breakout, plenary

11 am - Coffee break (20 minutes)

- **Talks + Q&A on Theme 3**, by Peter Tugwell (Journal of Clinical Epidemiology) on editorial competencies, and Jason Roberts (Origin Editorial) on editorial workflows.

12:30pm - Lunch (1 hour)

- Breakout and plenary session for Theme 3

3pm - Coffee Break (20 minutes)

- **Talk + Q&A on Theme 4**, by Larissa Shamseer (University of Ottawa), breakout, plenary

5:30pm - Wrap-up

6.30pm - Dinner at Page Road Grill (EBTC providing taxis)

Day 3

8am - Breakfast, 8:45am start

- Recap: lay out the ideas which have been proposed for assuring the quality of SRs in environmental health and toxicology, introduce how the plenary discussion will run (15 minutes)
- Divide into two breakout groups to discuss and agree on items for the action plan, items for longer-term strategic planning, and follow up process (1.5 hours)
- Presentation back to full group of results of discussion (15 minutes)

11am - Coffee break

- Full plenary discussion of items in the action plan, for final consensus (1.5 hours)

1pm - Lunch, depart

Plan for Thematic Breakout Sessions

Introductory talks: Speakers will present a brief overview of a range of issues which could be considered by editors, before picking out for special attention one or two interventions within the theme, for interest and to seed break-out discussions.

Facilitation: Participants will be split up into 3 groups of 7 [3 editors, 3 experts, 1 facilitator]. Each group will be provided with a short “brief” on the theme, laying out some of the principle challenges, to aid discussion and seed ideas about potentially effective interventions. Each group will appoint a rapporteur responsible for capturing ideas and discussion, and then brainstorm for 30 minutes as many challenges and interventions as they can think of.

After 30 minutes, the editors in the group will be asked to start prioritising the issues identified from the brainstorming and start outlining interventions which they might be able to make to address these issues. Potential interventions will be scored by consensus of the editors in three categories: ease of implementation; likely effectiveness; and immediacy of result. This will facilitate classification of interventions as being relatively easy and short-term, vs. more challenging and long-term. This will in turn facilitate their classification as items for the action-plan vs. longer-term strategy. At this point, the main role of the experts is to help the editors come to their own conclusions about what they could most usefully and realistically do.

In the final 5-10 minutes of the breakout, the editors select the interventions which they think are likely to be the most straightforward to implement, the three which are likely to be the most effective in the long-term, and any notable potential interventions they would otherwise like to highlight. These will be presented to the whole group (10 minutes per group). This should result in 6-9 ideas for interventions per theme, to set up the longer plenary and breakout discussions for the morning of Day 3.

Final plenary and breakout (Day 3): In this session, participants will split into 2 groups to discuss in more detail the relative merits and challenges to implementing a selection of the interventions, how those challenges are best overcome, and identifying which of the long- and short-term interventions have the best balance of feasibility and effectiveness. We will then discuss which of the most feasible and effective short-term interventions could be agreed upon as a potential action-plan for implementation across multiple journals, hopefully being able to come to agreement on an action-plan which can be published as a joint editorial committing to implementing these actions by 2020.

Participants

We have 21 confirmed participants (9 editors, 5 SR experts, 5 research quality experts, 2 facilitators), with coverage of 12 journals in total.

Editors		
Last Name	First Name	Journal
Cohen-Hubal	Elaine	Exposure Science and Environmental Epidemiology
Knudsen	Thomas	Reproductive Toxicology
Sim	Malcolm	Occupational and Environmental Medicine
Kacew	Sam	J Toxicol Environ Health (A and B), Critical Reviews
Olshan	Andrew	Epidemiology; Current Epidemiology Reports
Blaauboer	Bas	Toxicology in vitro
Wikoff	Daniele	Toxicological Sciences
Hair	Kaitlyn	BMJ Open Science
Boyd	Windy	EHP

Systematic Review Experts		
Last Name	First Name	Organisation
Woodruff	Tracey	Navigation Guide
Rooney	Andrew	NTP OHAT
Kwiatkowski	Carol	TEDX
Radke	Elizabeth	US EPA
Brozek	Jan	GRADE

Research Quality Management Experts		
Last Name	First Name	Organisation
Mellor	David	Centre for Open Science
Shamseer	Larissa	U. Ottawa
Roberts	Jason	Origin Editorial
Tugwell	Peter	J. Clin. Epi.
Page	Matthew	Monash University

Facilitators		
Last Name	First Name	Organisation
Whaley	Paul	EBTC / Environment International
Tsaioun	Katya	EBTC

Suggested Reading List

General Relevance

Pussegoda, K. *et al.* (2017). Systematic review adherence to methodological or reporting quality. *Systematic Reviews*. *Systematic Reviews*, 6(1), pp. 1–14. <https://doi.org/10.1186/s13643-017-0527-2>

Theme #1: Setting standards and providing guidance

Moher D. *et al.* eds. (2014) *Guidelines for Reporting Health Research: A User's Manual*. Oxford, UK: John Wiley & Sons, Ltd. <https://onlinelibrary.wiley.com/doi/book/10.1002/9781118715598>

Theme #2: Preventing mistakes before they happen

Nosek, B. A., & Lakens, D. (2014). Registered reports: A method to increase the credibility of published results. *Social Psychology*, 45(3), 137–141. <https://doi.org/10.1027/1864-9335/a000192>

Mandrioli, D. *et al.* WHO/ILO work-related burden of disease and injury: Protocol for systematic reviews of occupational exposure to dusts and/or fibres and of the effect of occupational exposure to dusts and/or fibres on pneumoconiosis. *Environment International* 119, 174-185

<https://doi.org/10.1016/j.envint.2018.06.005>

Theme #3: The editorial workflow

Galipeau J. *et al.* (2016). A scoping review of competencies for scientific editors of biomedical journals. *BMC Med*. <https://doi.org/10.1186/s12916-016-0561-2>

Resnik, D. B., & Elmore, S. A. (2016). Ensuring the Quality, Fairness, and Integrity of Journal Peer Review: A Possible Role of Editors. *Science and Engineering Ethics*, 22(1), 169–188.

<https://doi.org/10.1007/s11948-015-9625-5>

Rodgers, P. (2017). Decisions, decisions. *eLife*, 6(4), 476–500. <https://doi.org/10.7554/eLife.32011>

Theme #4: Measuring the efficacy of interventions

Walsh, E., Rooney, M., Appleby, L., & Wilkinson, G. (2000). Open peer review: a randomised controlled trial. *The British Journal of Psychiatry: The Journal of Mental Science*, 176, 47–51.

<https://doi.org/10.1192/bjp.176.1.47>

Heim, A. *et al.* (2018) Designs of trials assessing interventions to improve the peer review process: A vignette-based survey. *BMC Medicine*. *BMC Medicine*, 16(1), pp. 1–11.

<https://doi.org/10.1186/s12916-018-1167-7>

Kowalczyk, M. K., Dudbridge, F., Nanda, S., Harriman, S. L., Patel, J., & Moylan, E. C. (2015). Retrospective analysis of the quality of reports by author-suggested and non-author-suggested reviewers in journals operating on open or single-blind peer review models. *BMJ Open*, 5(9), 1–10.

<https://doi.org/10.1136/bmjopen-2015-008707>