# All Interventions Suggested by Breakout Groups

**Organised by Theme**

From Whaley et al. "Improving the quality of toxicology and environmental health systematic reviews: what journal editors can do"

Table showing full record of all interventions proposed by workshop participants during the workshop breakout sessions. To maximise creativity, brainstorming was not constrained. Ideas across multiple themes were put forward in multiple breakout groups. Suggestions are therefore associated with their relevant theme rather than the breakout discussion in which they were put forward. This explains the difference between the number of suggestions per breakout in the raw data from the breakout discussions and the numbers given below. Note that the groups did not consistently provide scores or indicate favourites in their written notes. After plenary discussions, a range of proposed interventions not initially indicated as favoured were advanced to the final prioritisation exercises. The scoring and prioritisation exercises were intended to encourage discussion rather than filter ideas.

**Total number of unique suggested interventions = 58**

- Theme 1: 18
- Theme 2: 8
- Theme 3: 17
- Theme 4: 3
- Other: 12

**Abbreviations**

- For scores
  - **AE** = Anticipated Ease of intervention
  - **AIM** = Anticipated Immediacy of effect of intervention
  - **AEF** = Anticipated Efficacy of intervention.
- Other abbreviations
  - **SR** = Systematic Review
  - **APC** = Article Processing Charge.

# Theme 1: Standards and Guidance

| Proposed Intervention | Suggested by Group | Notes from Breakout Group | Scores (AE/AIM/AEF) | Indicated as Favoured? (Reason in brackets) |
|---|---|---|---|---|
| Incentivise protocol submission | A | Suggested to provide APC discounts for authors submitting protocols and checklists. Suggestion to require that SRs be registered and be preceded by a priori protocols | | |
| **A:** Use reporting guidelines and checklists. **B:** "strongly encourage" use, focus on smaller number of items on checklist. **C:** Standardisation across minimum elements, common structure. | A B C | Suggested that journals coordinate to require use of the same reporting guideline. SRs should be submitted with a PRISMA statement. C: Too many items on checklists, focus on most critical (identified by methodologists). | B (encourage): 6/-/2.6<br>B (focus): 5.4/-/5.2 | B (encourage): Yes (for ease)<br>B (focus): Yes (for effectiveness) |
| Introduce enforcement practices (A), including automated compliance checks (B, C) | A B C | **A:** Automating the check of presence of and compliance with PRISMA statement would reduce editorial workload in relation to SRs. **B:** On submission, ask for review type then pull up checklist. **C:** Promote use of tools. Note that this improve workflow, but not necessarily the field | B (auto): 5.6/-/4.4<br>B (pull up): 6/-/5<br>C: 3/3/3 | B (auto, pull up): Yes (for ease) |
| Improve reporting practices | A | Require authors to make raw data available (code and tables). Fund the development of reporting software. Be cautious about checklists leading to too stringent practices. Discourage abuse of PRISMA guidance (false claims about compliance). Endorse Registered Reports and TOP guidelines. Encourage full disclosure of all decisions. | | |
| Improve dissemination of conduct and reporting standards | A | | | |
| Series of training articles on methods by people in the field | C | The value of having a "champion" from the field to encourage others to get on board. Include examples from the field. Can link to these articles in rejection decision letters. Note that training materials have lower impact if no further distribution beyond publication. | 5/4/4 | |
| Active feedback to authors on rejection of papers | C | Make it specific to systematic review, point towards existing guidance (e.g., PRISMA). Use a standard letter. Reliant on expertise among editors. Some studies may strip "systematic" from title (effective at removing bad reviews). | 7/7/4 | Yes |
| Pilot the process of requiring a checklist | B | | | |
| MIAMI-style agreement between journals on submission | B | | 1/-/4.6 | |

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| standard and required metadata or data sharing | | | | |
| Consultancy service to facilitate conduct of high quality SRs | B | e.g. publications centre at university to do additional work for standards checking prior to submission | 2.8/-/5.8 | Yes (effectiveness) |
| Implement FAIR principles for data science review papers | B | | 5.25/-/6.5 | |
| Audit of existing SR standards | A | Rhomberg paper on existing SR and weight of evidence standards provides information | | |
| Commission a series of exemplar SRs | A | | | |
| General case studies of good practice | A | For example, all the process changes for SRs being made at Environment International could be a detailed case study of journal implementation of comprehensive changes (webinar?), including workflow changes around protocols, triage tool, COSTER recommendations, etc. | | |
| Environmental health systematic review hub | A | Create EH SR hub as focal point for sharing useful tools for different audiences. Mailing list for updates / interest. Mechanism for engaging and updating editors (and authors) outside this group who are interested but not involved today. | | |
| Joint editorial announcing implementation shared standards | C | | | |
| Outreach to university libraries | C | Authors need to know about librarians as a resource in developing SRs | | |
| Social media outreach on standards | C | | | |

## Theme 2: Preventing Mistakes Before They Happen

| Proposed Intervention | Suggested by Group | Notes from Breakout Group | Scores (AE/AIM/AEF) | Indicated as Favoured? (Reason in brackets) |
|---|---|---|---|---|
| Author support toolboxes | A B | **(A)** Could include a writing template based on reporting guidelines; AI tools which appraise a manuscript against e.g. PRISMA and tells the authors if they are ready to submit; tools which provide RevMan-style contextual feedback supporting each step of manuscript writing; education about the Open Science Framework, potentially recommend its use. **(B)** | B: 5.8/-/5 | B: Yes (ease) |

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| | | Sharing information between journals for authors: curated, creative commons resources, warehouses, knowledge bases | | |
| Tying systematic reviews to protocols; piloting Registered Reports if certain conditions fulfilled (B) | A B C | **A:** Stop publishing SRs that do not have protocols that have been peer reviewed. Or, introduce a tiered approach to classifying level of pre-publication of methods - journals can decide what submissions should comply with (pre-reg; protocol; peer-reviewed protocol). **C:** The Registered Reports model as described seems like too much of a plunge at the moment, but is an interesting direction to move. Still a lot of questions. **B:** Piloting Registered Reports model feasible if primary outcomes known, following a protocol is possible, timeline is within scope. | B (general protocols): 3.2/-/6<br>B (Reg Reports): 3.25/-/6.25 | Yes (effectiveness) |
| Get ahead of potential author concerns | A | Be cautious about making authors vulnerable to predatory practices when publishing methods ahead of conducting research (stolen research ideas etc.). Education on benefits of protocol publication. | | |
| Anticipate and address procedural issues | A | Come up with a way of dealing with "zombie" protocols. Address or work around annual page limits in journals still using this sort of publication model. Title registration process with journals? Clarify nature of "guarantee of publication" of SRs which follow protocols that have been accepted in principle. | | |
| Raise awareness / educate the field that protocols are a critical part of SRs | C | What protocols are about, what they should include. | | |
| Case studies of use of protocols in conducting SRs. | C | Shared list of systematic reviews and protocols. Good field specific examples on a range of topics and range of standards/tiers. | | |
| Implementation of protocols with a publisher | B | | 3.25/-/6.5 | |
| Remove protocols from Impact Factor denominator | A | It is how Cochrane avoids diluting IF with protocols, maybe work with them to do it | | |

## Theme 3: Optimising Editorial Workflows

| Proposed Intervention | Suggested by Group | Notes from Breakout Group | Scores (AE/AIM/AEF) | Indicated as Favoured? (Reason in brackets) |
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| Create a "bank" or pool of specialist SR reviewers. **B:** | A B C | **A:** Methods specialists in particular are needed. Could reviewers be incentivised with non-payment rewards? Or | B (general bank): 3.6/-/6.2<br>B (post-doc bank): 4.25/-/7 | B: Yes (for effectiveness)<br>C: Yes |

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| potential focus on post-doctoral researchers | | could reviewers be paid for their work? Or give APC discounts for authors who agree to be reviewers? **A and C:** Share the pool and/or information on good reviewers between journals. | C: 5/6/7 | |
| Employ specialist SR editors | A | Methods expertise identified as being of particular importance | | |
| Editor support toolboxes | A | See CSE Editors Toolbox as example | | |
| Use a SR specialist for editing each SR submission (specialist SR associate editors) | A C | | C: 4/6/7 | C: Yes |
| Provide training and education (A, C), sharing more existing training materials (B), create new training materials e.g. videos, podcasts, case studies | A C | **A:** Training for authors on protocol development. Training on use of reporting guidelines. Tutorials tailored to environmental health research contexts. Provide training for reviewers. Get Open Science Framework concepts workshopped to other editors, peer-reviewers, stakeholders, students. Society support for training valuable. **B:** e.g. Elsevier publishing university, Cochrane interactive training. **C:** More ideas than time to flesh them out, all have challenges with developing appropriate training and linking it to the people who need it. For editors, without buy-in from the journal no progress can be made. Would be easier to develop training for multiple journals. For reviewers, on-line courses. For authors, deliver via professional societies and on-line. Use existing materials. For students, as prospective authors, offer online modules and training at meetings. | B (existing): 6/-/4.2<br>B: (new): 3.4/-/5<br><br>C (editors): 3/4/7<br>C (peer-reviewers): 4/3/3<br>C (authors): 4/3/3<br>C (students): 4/3/3 | B (existing): Yes (ease)<br><br>C: Yes, for education in general |
| Provide appraisal tools for editors | A | Use simple appraisal tools, e.g. short version of MECIR, for compliance checks | | |
| Pay $50-$500 for methods expertise | B | | 2.8/-/4 | |
| Cross-journal working group to address transparency standards in epidemiology and toxicology | B | | 5/-/5.5 | |
| Survey SR practitioners | A | Who is doing SRs? What guidelines are they using? What would they use? Who is funding them? Why are they doing them? Do academics get credit for doing SRs? Etc. | | |
| Engage professional and scientific societies | A C | Secure society support (including financial) for advancing SR approaches in disciplines - all the various things we are proposing in this workshop. A mechanism for this can include engagement of high-level people; trainings and symposia at conferences (examples of this already happening); webinars as something small, easy, scalable to demonstrate / gain early interest fairly easily. Target subspecialties, newsletters etc. Engage with the Scientific Liaison Coalition. | | |
| Define the role journals should have in developing or improving SR practices | A | | | |

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| Introduce some taxonomic hygiene | A | There are lots of concepts floating about the place (SR, scoping review, etc.). These should be defined and clarified between the journals, so we know what standard to set for what type of research | | |
| Editorial on common challenges in SR identified by editors | C | | | |
| Public peer review of protocols | C | See for example F1000. | | |
| Pass a law. ICMJE model. Funders. OECD. WHO. NAS. Any sponsoring SR entity | B | Targeted at policy makers. Benefit: the policymakers would trust the existing SRs more. | | |
| If journal requires a pre-submission inquiry, the journal provides these requirements and registration expectations. Update the AGs. Update submission system to ask for the protocol if it is a SR. | B | Targeted at journal editors. Benefit: More relevant submissions. SRs are asked to send a pre-submission. | | |
| Go to Cochrane reviews. SYRCL provides training. Database of resources. Symposia at meetings, webinars, short courses. NIEHS funded centres and resources (find out who has these resources). | B | Targeted at educators. The pipeline is improved because they are trained and show their trainees the right way to do SRs. | | |

## Theme 4: Evaluating the Effectiveness of Interventions

| Proposed Intervention | Suggested by Group | Notes from Breakout Group | Scores (AE/AIM/AEF) | Indicated as Favoured? (Reason in brackets) |
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| Evaluate interventions with a randomised controlled trial | B | | 2.2/-/5.4 | |
| Ask publisher to fund an intervention, trial or evaluation | B | | 2/-/4.6 | |
| Audit of current SR practices | A C | The quality (reporting and/or conduct) of current SRs. Find out what people are doing, when they claim to be doing a SR (sense of current level of community understanding). Use Page et al. 2016 data extraction sheet to make audit job easy. Find out the characteristics of who is doing SRs. | | |

# Other Suggested Interventions

| Proposed Intervention | Suggested by Group | Notes from Breakout Group | Scores (AE/AIM/AEF) | Indicated as Favoured? (Reason in brackets) |
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| Establish a network of SR editors | A | | | |
| Other forms of stakeholder engagement | A | Conduct upstream workshopping of potential interventions with authors, funders, other important change-making stakeholders. Find out from authors what they are willing to do to improve the quality of their submissions. | | |
| Badges for standards-compliant or high quality publications | A | | | |
| Editorial – minimal elements for SR (C) espousing journal desires (B) | A B C | **C:** Allow flexibility across fields, define types of reviews. Keep it simple and clear. Identify key elements (possibly from multiple tools). Not everyone understands what a systematic review is. There may also be differences in how the terminology is interpreted by field, etc. We need to define terms being used, including different types of reviews (systematic, narrative, scoping, maps).<br>Bring everyone to the same baseline. | B: 5.1/-/3.2<br>C: 6/4/5 | C: Yes |
| Add classification terms for SR expertise to reviewer databases | C | Improves ability to identify SR experts. For reviewers and editors to indicate in system who has expertise in SR | 7/7/7 | Yes |
| Have government agency use the reporting guidelines | B | | 1.6/-/6 | Yes (effectiveness) |
| Champion editors to promote best practice in handling and publishing of SRs | A | Promoting e.g. open science principles | | |
| Be sensitive to context | A | Different editors operate in different circumstances, e.g. some have mission to help generate research to support decision-makers, others just help authors do good work, etc. Tiered approaches may help. Do research into how e.g. protocol publication policies may have impact within different regulatory regimes. | | |
| Case studies of editorial handling practices for SRs | A | Provide lots of case studies of how, in detail, journals are responding to these challenges, things they are actually doing | | |
| Community-building | C | Organizing/building consensus. Role for funders (bring into future workgroup meetings). SOT activity (specialty section, | | |

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| | | special interest group, symposium). Brand as “open science” instead of SR. | | |
| SR for exposure science commentary to get the ball rolling | A | Responding to how SR still completely novel in exposure science. | | |
| Publish executive summaries of SRs with the full SR as a supplement | C | To address the challenge of the length and scope of SRs, making them difficult for journals to publish. | | |