



Cochrane

Project Transform

Introducing Living Systematic Reviews

Cochrane Learning Live webinar

23 March 2017

Anneliese Synnot

Cochrane Australia, Monash University

**Trusted evidence.
Informed decisions.
Better health.**





Project Transform

Acknowledgements

- Julian Elliott and Tari Turner, Cochrane Australia, Monash University
- Harriet MacLehose, Cochrane Editorial Unit
- The Living Systematic Review Network





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Outline

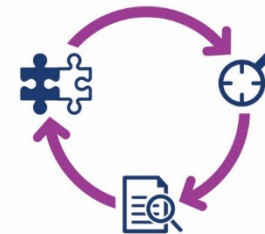
1. Background
2. What is a Living Systematic Review (LSR)?
3. When an LSR is appropriate
4. LSR methods
5. Production and publication implications of LSRs
6. LSRs in practice: Cochrane and beyond





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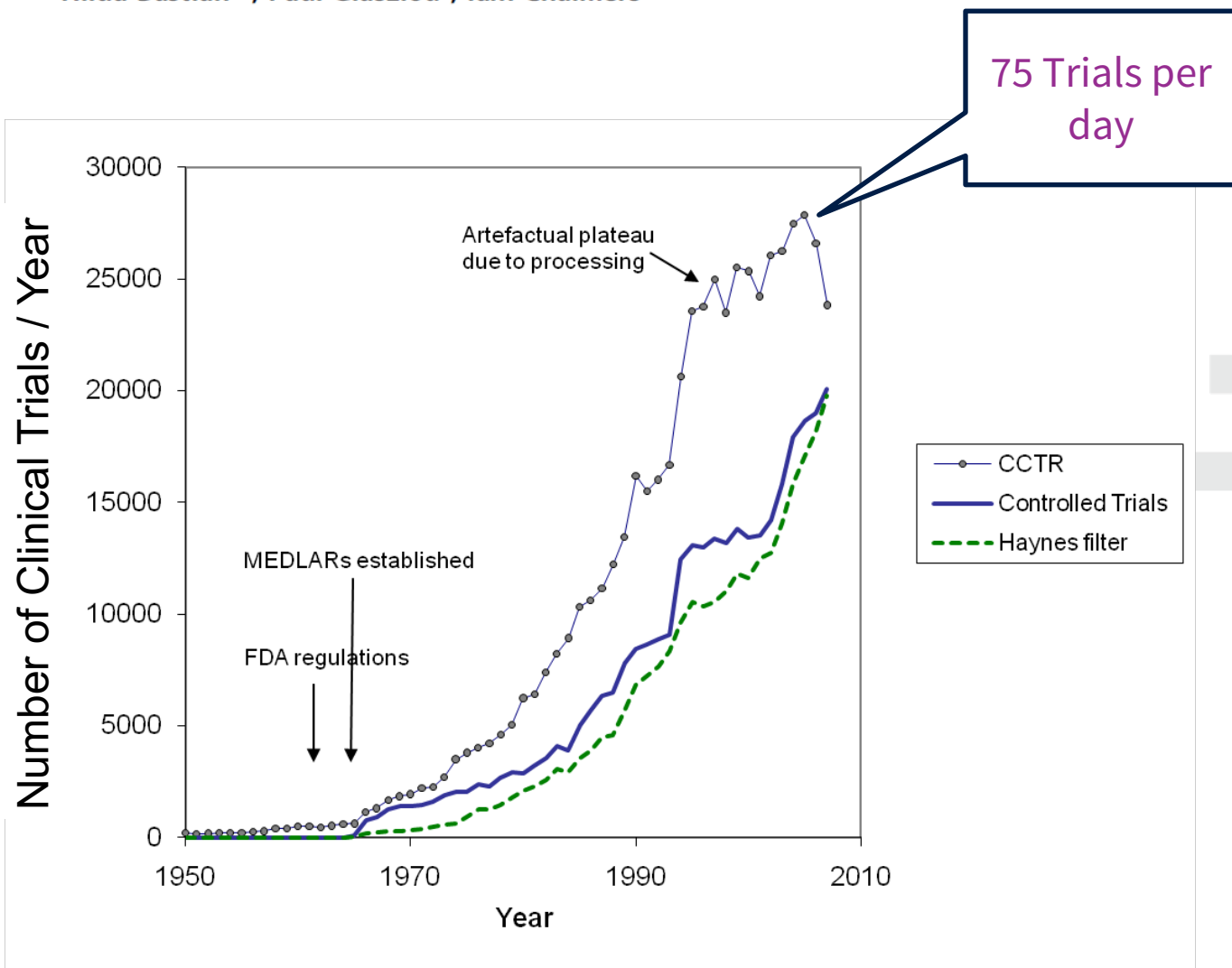
1. Background



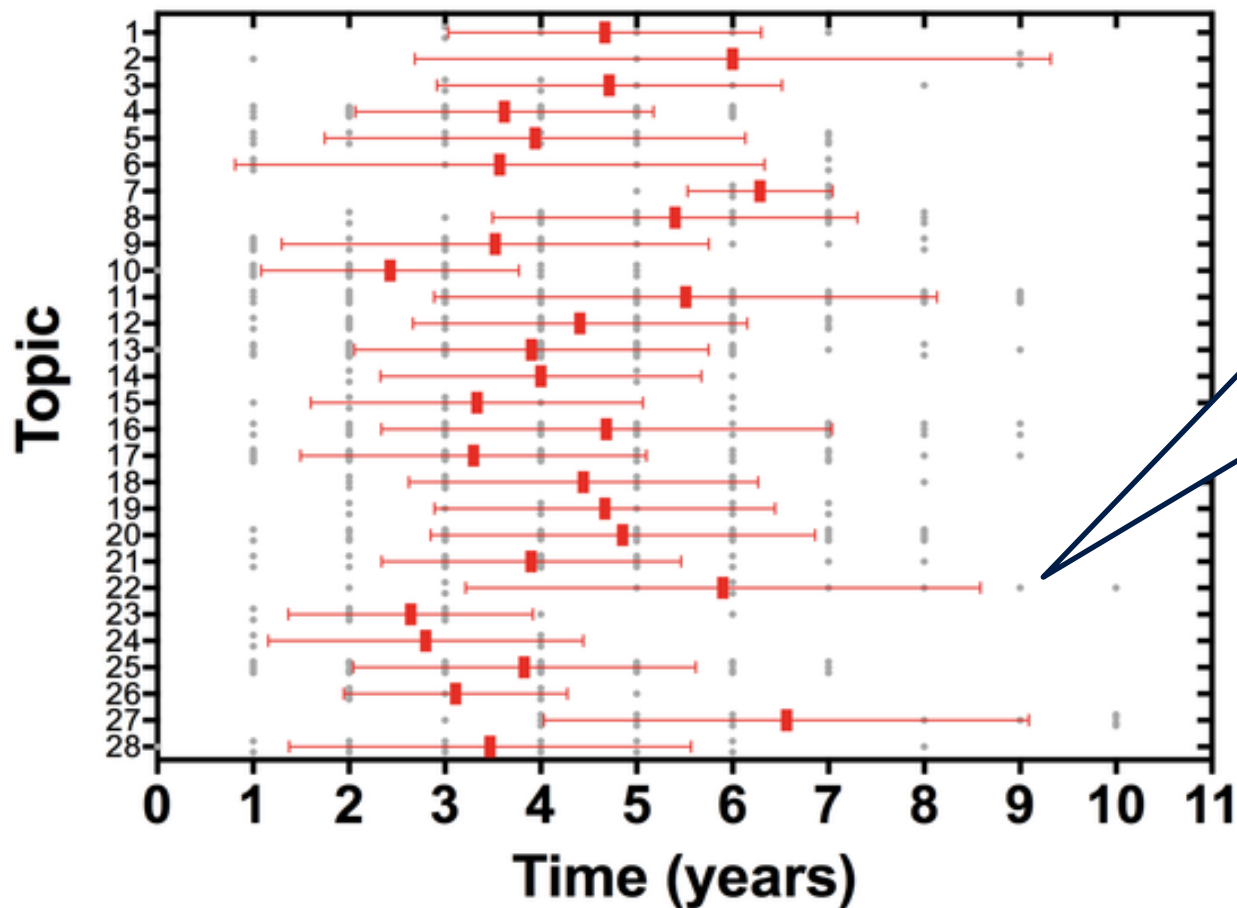


Seventy-Five Trials and Eleven Systematic Reviews a Day: How Will We Ever Keep Up?

Hilda Bastian^{1*}, Paul Glasziou², Iain Chalmers³

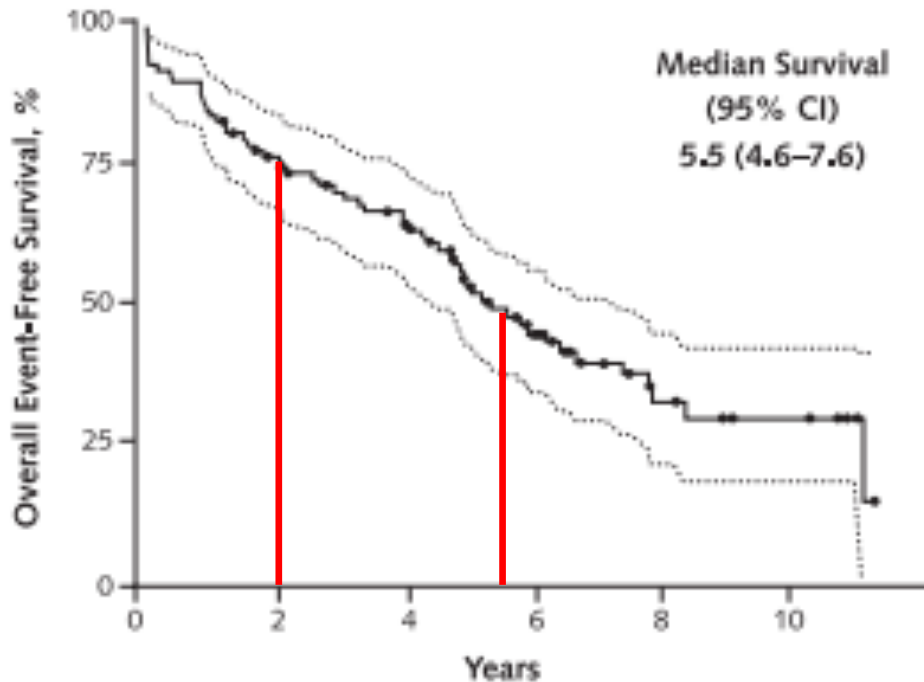


Time from study to systematic review



Median time from study published to included in systematic review is 2.5 to 6.5 years

Survival of systematic review accuracy



Systematic reviews
at risk, n

100 73 59 34 14 6

Currency versus quality trade-off





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OPEN ACCESS Freely available online



Policy Forum

Living Systematic Reviews: An Emerging Opportunity to Narrow the Evidence-Practice Gap

**Julian H. Elliott^{1,2*}, Tari Turner^{2,3}, Ornella Clavisi⁴, James Thomas⁵, Julian P. T. Higgins^{6,7},
Chris Mavergames⁸, Russell L. Gruen^{4,9}**

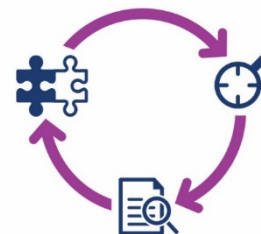
1 Department of Infectious Diseases, Alfred Hospital and Monash University, Melbourne, Australia, **2** School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia, **3** World Vision Australia, Melbourne, Australia, **4** National Trauma Research Institute, Alfred Hospital, Melbourne, Australia, **5** EPPI-Centre, Institute of Education, University of London, London, England, **6** School of Social and Community Medicine, University of Bristol, Bristol, England, **7** Centre for Reviews and Dissemination, University of York, York, England, **8** Informatics and Knowledge Management Department, The Cochrane Collaboration, Freiburg, Germany, **9** Department of Surgery, Monash University, Melbourne, Australia

The Bridge from Evidence to Practice

Summary

Elliott 2014 PLoS Med 11(2)

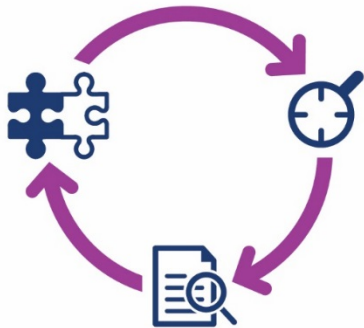
2. What is a Living Systematic Review?



What is a Living Systematic Review?

A systematic review that is continually updated, incorporating new evidence as it becomes available.

Adapted from Elliott 2014 *PloS Med* 11(2)



Key elements:

- “Systematic review” (retains core methods)
- “Continually” (frequency?)
- “Updated” (where?)
- “Incorporating new evidence” (how?)



Other related definitions

Live cumulative network meta-analysis

“A single systematic review and evidence synthesis encompassing the whole randomised evidence for all available treatments in a specific condition and continuously updated.”

Créquit 2016 BMJ Open 6

Living meta-analysis

“Data are maintained and publicly available online; other investigators are invited to make use of the data and to make online additions to the analysis when new data are available.”

Simpson 2016 J Crit Care 36

LSR vs SR: Key differences

Category	Item	Description
Production	Work processes	Search strategy maintained and fed continuously into SR workflow
	Author team management	Coordinated and continuous effort
	Methods	LSR-specific approach to search and study incorporation is pre-specified; Potential statistical adjustments to allow for frequent updating of meta-analysis
Publication	Publication format	Persistent, dynamic, online-only publication



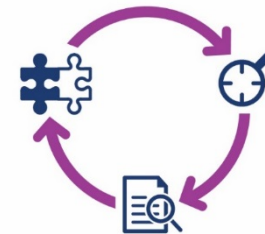
Features of Cochrane LSR approach

- A new review or an update can be living
- Applies to any type of review (e.g. qualitative, network meta-analysis)
- Core review methods remain; some additional LSR-specific methods apply
- LSR-specific methods must be pre-specified in protocol
- Evidence surveillance (searching) is continual
- Reader *alerts* are continual, but not necessarily *full re-publication* of review with new evidence



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3. When an LSR is appropriate





When should you do an LSR?

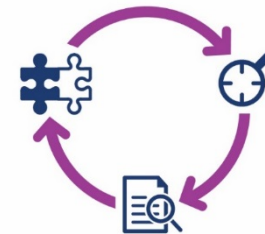
- ✓ High priority (or emerging) question for policy and practice
- ✓ Important uncertainty in the existing evidence
- ✓ Emerging evidence (e.g. in trial registers) that is likely to impact on what we currently know
- ❖ You and your network of contributors have capacity and resources to sustain an ongoing SR commitment



LSRs as part of something bigger



4. LSR methods



Cochrane Living Systematic Reviews

Interim guidance for pilots
(Draft version 0.2)



Protocol template: Cochrane Living Systematic Reviews



Methods considerations specific to LSRs	LSR protocol suggested text and/or examples
Background	
Description of the condition; Description of the intervention; How the intervention might work	
No changes proposed	N/A
Why it is important to do this review	
It should be clear to the reader why a Living Systematic Review approach is appropriate for your Cochrane Review.	<u>Suggested text</u> No suggested text is provided, since this will vary from review to review.



LSR methods: Searching

- Search frequency should be explicit
 - Electronic databases, and trial registers, searched monthly (via auto-alerts)
 - Other sources (websites, conference proceedings) on a case-by-case basis
- Search strategies should be re-run in full
- Search sources and strategies reviewed over time





LSR methods: Screening

- Screening frequency should be made explicit
 - (Need to *screen* monthly if *searching* monthly)
- LSR's *may* use technological tools to support screening, if so, should be described, e.g.
 - Machine learning / RCT Classifiers
 - Citizen science





LSR methods: Data extraction and risk of bias assessment

- No changes to review methods
- LSRs *may* use technological tools to support data extraction and risk of bias assessment, if so, should be described





LSR methods: Data synthesis

- Deciding *when* to incorporate new evidence
 - Default position: immediate incorporation of new evidence (studies, data, information)
 - BUT, may be instances (e.g. very small study) where it doesn't change review findings / credibility in meaningful way.
 - Decision rules can be devised about *when* new evidence will be incorporated.





LSR methods: Data synthesis

- Adjustments for frequent meta-analyses
 - Frequently updated meta-analyses can lead to inflated false-positive rate
 - Issue applies to all SR updates (not just LSRs)
 - Current work underway in Cochrane, and elsewhere
 - No clear consensus yet on the best approach to manage this





LSR methods: Other

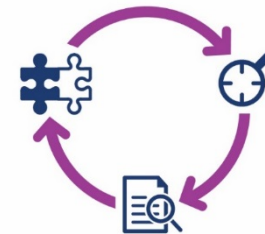
- Occasional review of scope and methods should be pre-specified
 - Methods and the topic area may change over time
- Some thought to when the review will no longer be kept living
 - Unlikely to need an LSR forever (!)



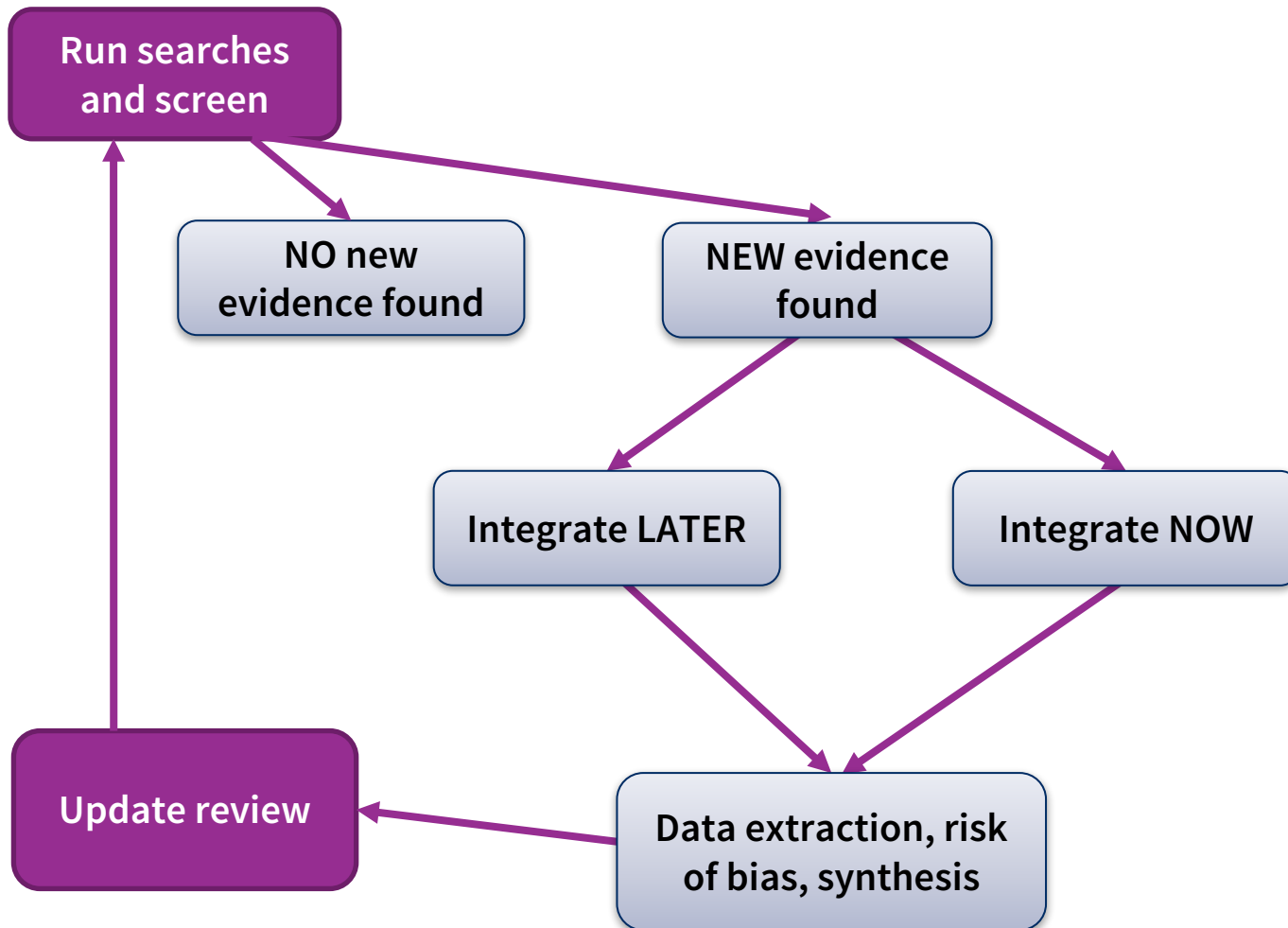


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5. Production and publication implications of LSRs



Basic LSR process





Author / team implications

- Planning for ongoing contribution (do and maintain!)
 - Frequent, small commitment from authors
 - Needs clear project management
- Size of author team
 - Larger teams may be needed
- Evolving author team
 - Maintaining institutional memory and consistent approach critical





Author / team implications

- Academic credits
 - Existing and new authors need appropriate acknowledgement via new citations
- Funding
 - Funding tends to be time-limited, may need creative ways to fund an ongoing commitment



(Living) systematic review enablers

Category	Item	Description
Production	Workflow and collaboration tools	Tools and platforms for SR authoring (e.g. Covidence, EPPI-Reviewer)
	Semi-automation	Machine assisted SR production processes (e.g. machine learning, Evidence Pipeline)
	Data repositories and linked data	Repositories of structured SR data (e.g. Cochrane linked data project)
	Participation and the crowd	Large and diverse author groups, citizen and crowd participation (e.g. TaskExchange, Cochrane Crowd)



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LSR publishing challenge

- Each systematic review (and update) is a new article
 - Each article has a unique identifier (Digital Object Identifier = DOI)
 - DOI = new citation
 - New citation = new entry in PubMed
 - So if re-publish LSR each month = ++new citations
- ❖ Confusing for readers, more work for authors / publishers and low citations per article





LSR publishing options

- Publish elsewhere (i.e. project website)
- Publish less frequently (e.g. yearly)
- Allow post-publication revisions to article
- Or split the *process* from the *publication*:
happening? versus What's new?

What's



What's happening?

What's new?

What?

*Review being updated
Another ongoing study No
new trials*

*New studies incl/excl Findings
have changed New protocol*

How?

Information around the
article

update
type?

Article
Other article

Where?

Journal website

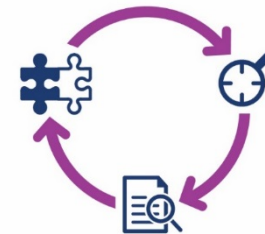
Journal website

PubMed



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5. Example LSRs: Cochrane and beyond



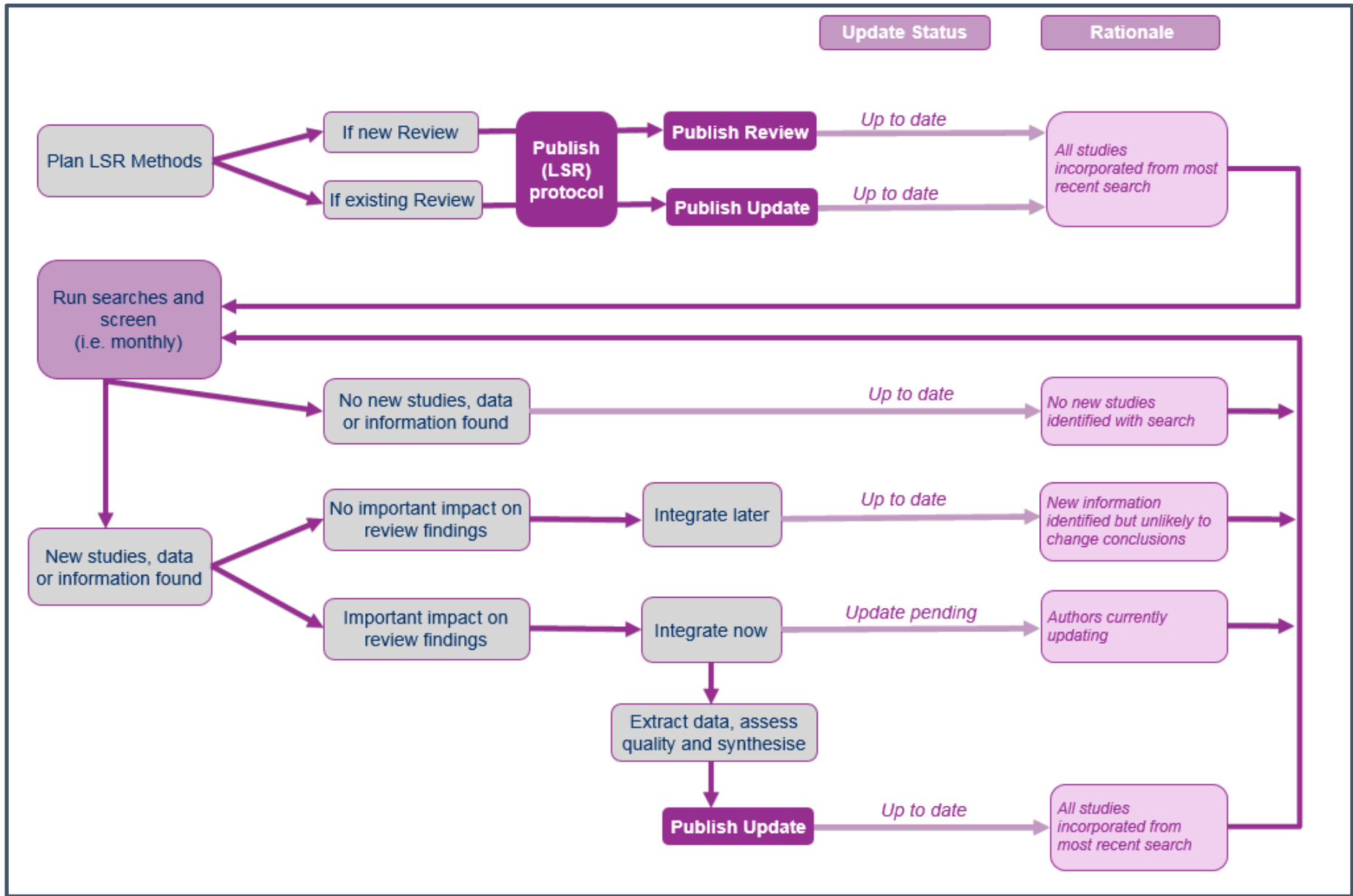


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Cochrane LSR pilots

- 4 x author groups, each piloting ≥ 1 Cochrane Review
- LSR methods / model devised by LSR Network
- Support and evaluation provided by Project Transform
- First Cochrane Reviews transitioning to LSRs on the Cochrane Library in coming months
- Using Update Status Classification to communicate 'What's happening'
- Re-publishing the review to communicate 'What's new'





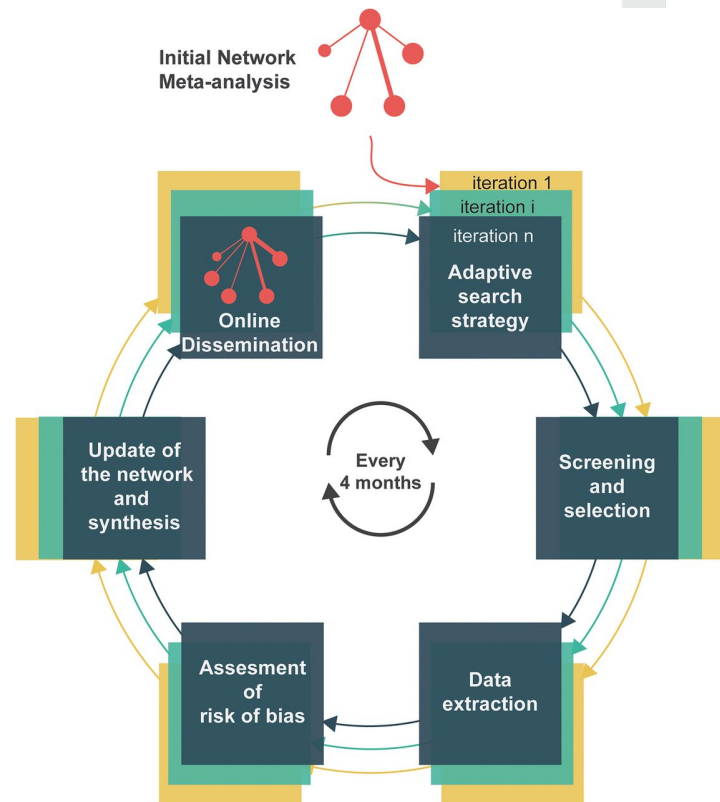


What's happening (Update Status)

Status	Up to date
Rationale	New information identified but unlikely to change conclusions
Explanation	This is a Living Systematic Review. Searches are run and screened monthly. Last search date XX. A new stud(ies) has(ve) been identified in a recent search [hyperlink to DoI] but the new information is unlikely to change the review findings (as assessed by the authors and editorial team). The conclusions of this Cochrane Review are therefore considered up to date.

Other LSR examples

- Cnossen 2015 *J Neurotrauma* Oct 2015
- Brazinova 2015 *J Neurotrauma* Nov 2015
- Simpson 2016 *J Crit Care* 36
- Rahal 2016 *PLoS One* 11(4)
- Crequit 2016 *BMJ Open* 6



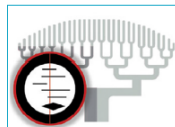
Crequit 2016 *BMJ Open* 6
(Figure 1)



Involving a community

Correspondence

A call for researchers to join the META-MICROBLEEDS Consortium



META-MICROBLEEDS

Consortium/initiative

During the last decade, cerebral microbleeds, a common neuroimaging finding in patients with cerebral small-

international collaborations, including group-level and individual patient data meta-analyses of cerebral microbleeds.

and other information sources, and we plan to invite these people to join the Consortium. Our initiative

Crequit 2016 *BMJ Open* 6
livenetworkmetaanalysis.com




Contribute




Charidimou 2016 *Lancet Neurol* 15(9)

We're currently developing live cumulative network meta-analysis as a new approach to evidence synthesis. At the same time, we need your help to make this cumulative network meta-analysis project as wide as possible.

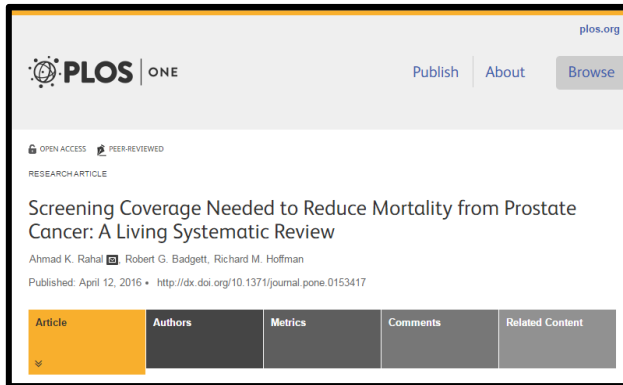
You can contribute in several ways, either by getting directly involved in a live cumulative network meta-analysis, or by spreading the word

- If you'd like to **contribute** to the ongoing live cumulative network meta-analysis on second-line treatments of advanced lung cancer or subcutaneous emphysema
- Share on Facebook  Partager
- Send a Tweet

Here are a few examples that you can use:

- "Embrace live cumulative network meta-analysis for evidence synthesis <http://livenetworkmetaanalysis.com> 
- "Live Cumulative Network Meta-analysis : the future of evidence synthesis? <http://livenetworkmetaanalysis.com> 
- "A single synthesis covering all treatments for the same disease, systematically updated when new trial results become available <http://livenetworkmetaanalysis.com> 
- Send us feedback at livenma@AT*cochrane.fr

Results on websites



[plos.org](#)
 Publish About Browse
 OPEN ACCESS PEER-REVIEWED
 RESEARCH ARTICLE
Screening Coverage Needed to Reduce Mortality from Prostate Cancer: A Living Systematic Review
 Ahmad K. Rahal, Robert G. Badgett, Richard M. Hoffman
 Published: April 12, 2016 • <http://dx.doi.org/10.1371/journal.pone.0153417>
 Article Authors Metrics Comments Related Content

Rahal 2016 *PLOS One* 11(4)

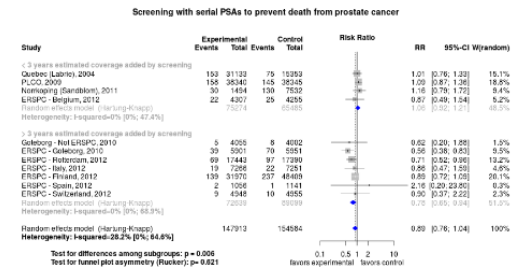
Prostate cancer screening with prostate specific antigen

A living systematic review

[View the Project on GitHub](#)

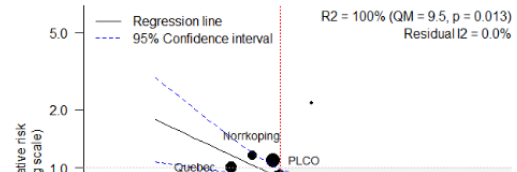
- PRISMA documentation
- Reconciliation of studies included with other meta-analyses
- PICO table
- Risk of bias table
- Calculations and plots of years of monitoring added by screening in each trial
- Forest plot(s) (source data)
- Prostate Facts (patient information handout)

The forest plot for the primary outcome is below. Additional forest plots of secondary analyses may be available.



The metaregression for the primary outcome is below. Additional metaregression plots may be available.

Determining the minimum years of screening required to reduce death from prostate cancer



This project is maintained by [openMetaAnalysis](#)

Adherence to Guidelines in Adult Patients with Traumatic Brain Injury: A Living Systematic Review

Maryse C. Crossen,¹ Annemieke C. Scholten,¹ Hester F. Lingsma,¹ Anneliese Synnot,^{2,3}
Emma Tavender,⁴ Dashiell Gantner,² Fiona Lecky,⁵ Ewout W. Steyerberg,¹ and Suzanne Polinder¹

Adherence to Guidelines in Adult Patients with Traumatic Brain Injury: Living Systematic Review Update 2

This article is published as a Living Systematic Review. All Living Systematic Reviews will be updated at approximately three month intervals, with these updates published as supplementary material in the online version of the Journal of Neurotrauma. (To review original article click here.)

TABLE 1. LIVING SYSTEMATIC REVIEW HISTORY

Version	Search date	Number of new included studies	Implications for conclusions
Original	October 2014	22	n/a
Update 1	September 2016	This update: 7 Cumulative for updates: 7	<ul style="list-style-type: none">• Adherence to ICP monitoring guidelines was higher in studies published in 2015 and 2016 than reported in the original review• The association between guideline adherence and clinical outcome became more uncertain due to the inclusion of a high-quality study that did not find an association between adherence and outcome
Update 2	January 2017	This update: 1 Cumulative for updates: 8	<ul style="list-style-type: none">• As update 1