



# Literature search in rapid reviews

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# Aims of this session

- Considerations and recommendations on planning and conducting systematic searches for rapid reviews,
- Examples, useful software and tools

# Survey



- What role do you fill at your organisation?



- What is your experience with rapid reviews?

# Cochrane Rapid Review

## Definition:

‘A type of evidence synthesis that brings together and summarises information from different research studies to produce evidence for people such as the public, healthcare providers, researchers, policymakers, and funders in a systematic, resource-efficient manner. This is done **by speeding up the ways we plan, do and/or share** the results of conventional structured (systematic) reviews, by **simplifying or omitting a variety of methods** that should be clearly defined by the authors.’

# Rapid Review searches

abbreviate or limit the systematic literature search in some way to accelerate review production.

## Two options:

- Reducing time spent on conducting searches
- Reducing the size of the search result

# Context

## Original and updated Cochrane RR Methods guidance:

- Garritty C, Gartlehner G, Nussbaumer-Streit B, King VJ, Hamel C, Kamel C et al. Cochrane Rapid Reviews Methods Group offers evidence-informed guidance to conduct rapid reviews. *Journal of Clinical Epidemiology* 2021; 130: 13-22.
- Garritty C, Hamel C, Trivella M, et al. Cochrane Rapid Review Methods Guidance – Updated Recommendations. Submitted manuscript, 2023.

## Rapid reviews methods series:

- Klerings I, Robalino S, Booth A, et al. Rapid reviews methods series: Guidance on literature search. *BMJ Evidence-Based Medicine* 2023:bmjebm-2022-112079. doi: <https://dx.doi.org/10.1136/bmjebm-2022-112079>



# Updated Cochrane RR Methods Guidance

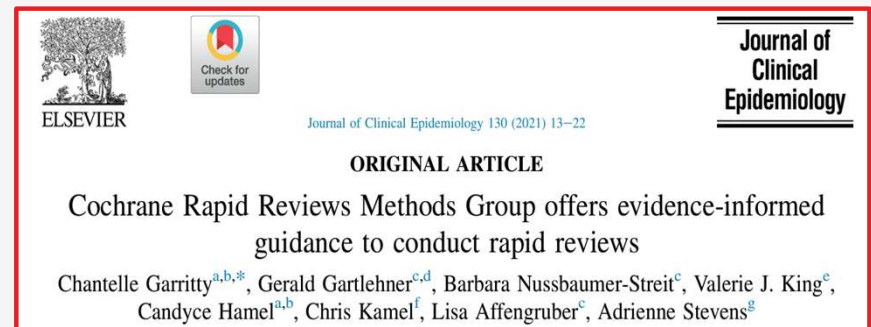
## Search Recommendations

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# Cochrane RR Interim Methods Guidance

- **Interim guidance informed by:**
  - A scoping review of the underlying evidence
  - Primary methods studies conducted
  - A survey sent to 119 representatives from 20 Cochrane entities, who were asked to rate and rank RR methods across stages of review conduct
  - Discussions among RR methods experts



- Resulted in 26 RR methods recommendations for which there was a high or moderate level of agreement or scored highest in the absence of such agreement
- Fast forward (4-years) and post-COVID (cited >300 times), recognize need for continuous improvement in RR methodologies





## Updated Cochrane RR Methods Guidance

- Builds upon the previously published interim guidance (**foundation**)
- Comprehensive **literature scan** to identify relevant publications related to RR methodology
- Incorporates findings from **a formal evaluation** that looked into aspects of adherence, comprehensibility, usability, and usefulness<sup>4</sup>
  - Involved analysis of 128 RR (17 Cochrane and 111 non-Cochrane) and in-depth qualitative interviews with 20 authors
  - Critical insights into areas needing rewording or clarification for certain recommendations; message that the guidance needs to be clearer and more actionable while keeping in mind a diverse range of users, including those with varying levels of experience in systematic and RR methodologies
- Collaborated with a **broader group of RR methodologists**, led by the Cochrane RRMG, so modifications were well-informed and collectively endorsed
  - Resulted in the publication of a multi-part series in BMJ Evidence-Based Medicine – takes an in-depth exploration of various methodological decisions throughout the RR process<sup>5-8</sup>



## Updated Cochrane RR Methods Guidance

- Refined list of **23 recommendations**, with supporting examples, and provides best practice considerations and practical tips for RR teams to increase efficiencies
  - **Key Considerations:**
    - RRs may follow **various methodological paths**; tailored based on time, resources, restrictions, and evidence (not a ‘one size fits’ all approach)
    - **Not all recommended restricted methods must be followed**; stricter methods can be used if feasible
    - Cochrane RRs should be **driven by the need for timely evidence for decision-making purposes**, including addressing urgent and emergent health issues and questions deemed high priority
    - RR **timelines will vary and depend several factors** (e.g., complexity of the topic, urgency of the decision-maker to meet a timeline, which are often short) (Cochrane RRs  $\leq$  6 months)
    - Despite the term “rapid” in it, **time is not the sole defining feature** of RRs (restricted SR methods used)
  - Guidance focuses on questions related to **RRs of health intervention effectiveness**
  - May be **adaptable for non-Cochrane RRs of effectiveness**; not yet extended to other RR question types due to unique challenges
  - RR author teams should consist of **individuals with expertise** in information retrieval, clinical knowledge, and SR methods
  - Teams should have **access to essential resources** before starting a RR including relevant electronic databases (e.g., MEDLINE, CENTRAL, CINAHL), reference management software, screening tools (e.g., Rayyan, Covidence), virtual meeting platforms, and communication tools (e.g., Slack)

# Searching



**Recommendation 4:** Involve an information specialist to develop the search strategy, and to consider search methods, resources, and search limits



**Recommendation 5:** Select a small number (but at least 2) bibliographic databases that are likely to retrieve relevant literature



**Recommendation 6:** Use the PRESS checklist to peer review the primary search strategy



**Recommendation 7:** Assess the need for grey literature and supplemental searching. Justify the sources to be searched

# Survey



- If you are not an information specialist, do you have access to information specialist/librarian support for your (rapid) reviews?

# Searching



**Recommendation 4:** Involve an information specialist to develop the search strategy, and to consider search methods, resources, and search limits

- Planning the search is part of the RR protocol
- At minimum: consult information specialist (e.g. librarian) for selecting information sources and providing feedback on the primary search strategy
- Perform preliminary searches during topic refinement to help inform eligibility criteria

# Searching



**Recommendation 5:** Select a small number (but at least 2) bibliographic databases that are likely to retrieve relevant literature

- For RRs focused on RCTs only: choose 2 of those: MEDLINE, Embase; or MEDLINE combined with e.g. study register, similar articles via PubMed, etc.
- For RR including non-randomized studies: MEDLINE and specialized databases (e.g. CINAHL, PsycInfo, ERIC)

# Searching



**Recommendation 6:** Use the PRESS checklist to peer review the primary search strategy

- at minimum: double check for typographical errors, missed keywords, and overall structure



<http://dx.doi.org/10.1016/j.jclinepi.2016.01.021>

# Searching



**Recommendation 7:** Assess the need for grey literature and supplemental searching. Justify the sources to be searched

- Limit to a minimum (e.g. trial registries, review SR bibliographies, reference list checking of included studies)
- extent depends on the RR topic





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## Rapid reviews methods series: Guidance on literature search

Irma Klerings <sup>1</sup>, Shannon Robalino,<sup>2</sup> Andrew Booth <sup>3</sup>,  
Camila Micaela Escobar-Liquitay <sup>4</sup>, Isolde Sommer,<sup>1</sup>  
Gerald Gartlehner <sup>1,5</sup>, Declan Devane,<sup>6,7</sup>  
Siw Waffenschmidt,<sup>8</sup> On behalf of the Cochrane Rapid  
Reviews Methods Group

## Search Recommendations

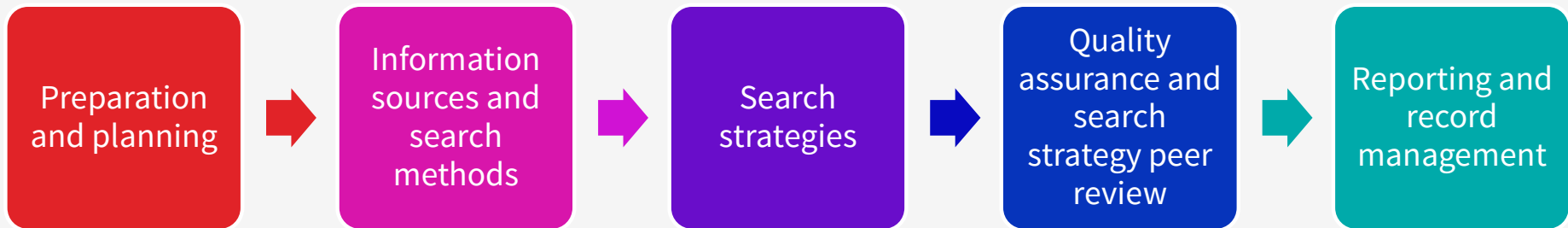
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# RR methods series: Guidance on literature search

- Part of an article series on behalf of the Cochrane Rapid Reviews Methods Group
- Recommendations derive from current systematic search guidance, evidence on modified search methods and practical experience conducting RRs.
- **Context:** Compatibility with overall RRMG guidance, but applicable to most RRs
- **Goal:** No one-size-fits all approach, facilitate choice of appropriate methods and understanding of limitations of modified search methods
- **Target audience:** rapid review authors, information specialists/librarians

# Recommendations

16 recommendations in 5 areas, covering the whole search process



⇒ Some recommendations are unchanged compared to full systematic reviews

⇒ Appendix with examples and practical considerations

## Preparation and planning

Recommendation for RRs	Different from SR guidance?
Involve an information specialist (eg, librarian)	No
Use prepared templates for planning and conducting the search	Maybe
Conduct scoping searches, identify a first set of potentially relevant literature	No

**Preparation is crucial:** Time can be saved by involvement of expert searchers, use of templates and standards, and scoping

# Information sources and search methods

Recommendation for RRs	Different from SR guidance?
Select a small number (at least 2) of highly relevant information sources	Yes
Recommendations for finding RCTs	Yes
Assess if grey literature may be relevant for the topic	Yes

**Opportunities for „shortcuts“/restricted methods:** Choose only highly relevant sources & methods



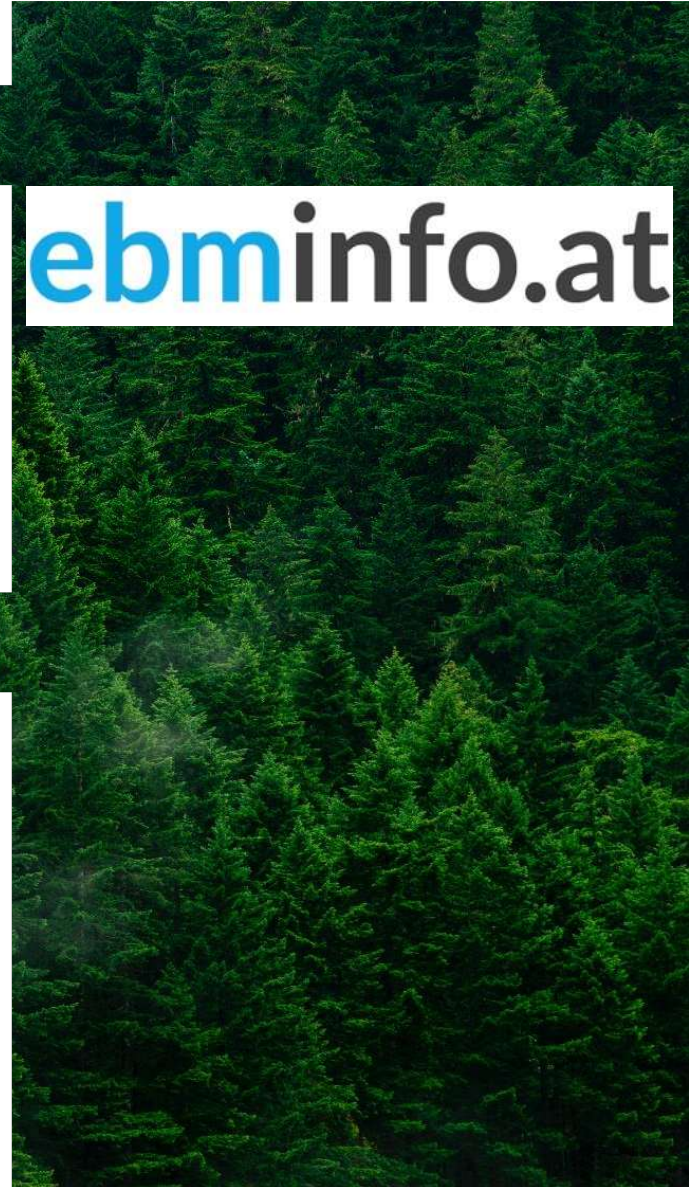
# **Example:**

## **Templates, preliminary searching, choice of information sources**

*Limits of standardised search processes*



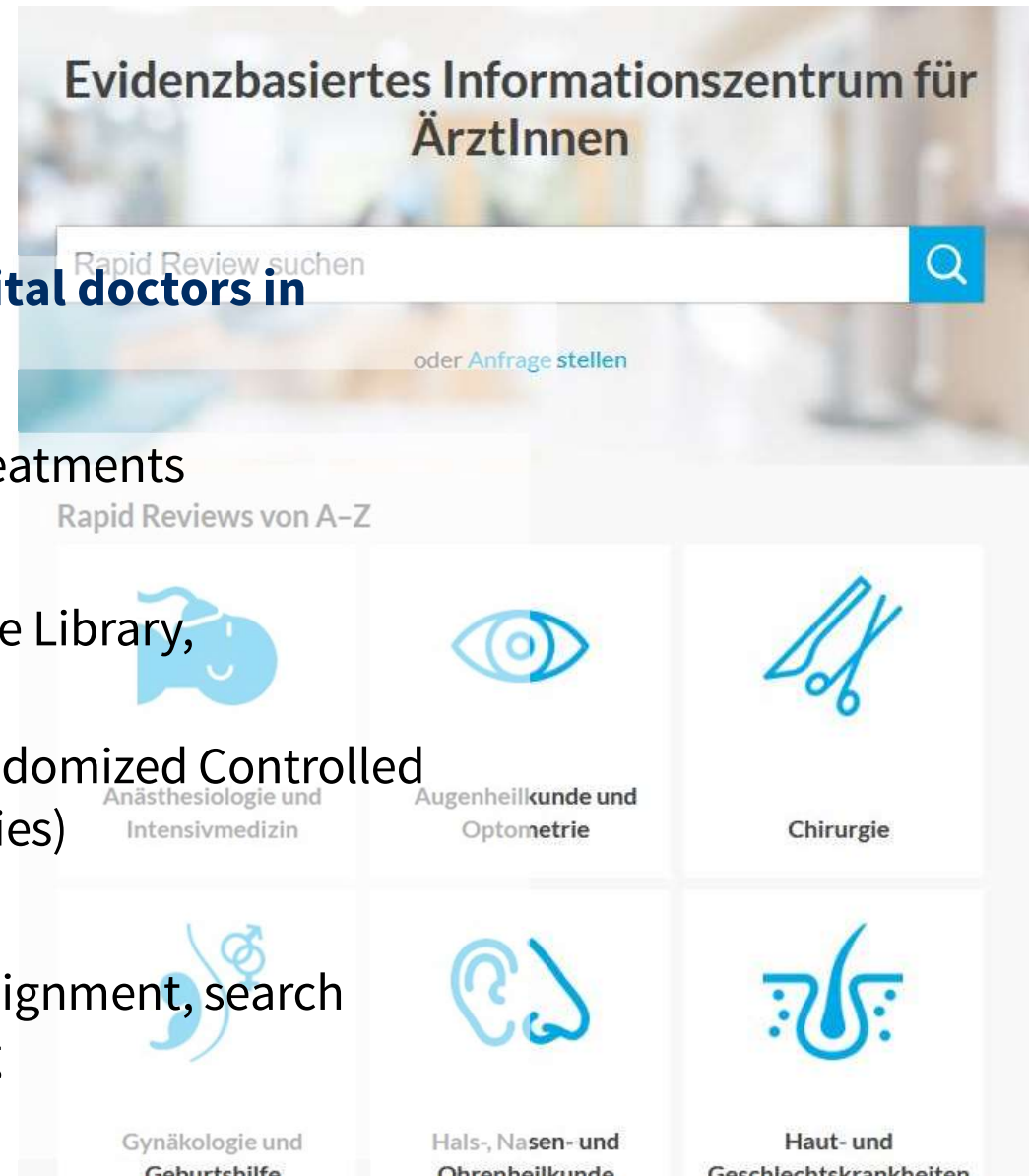
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## On-demand rapid reviews (RRs) for hospital doctors in Lower Austria

- **Focus:** precise questions about clinical treatments
- **Standard „shortcuts“:**
  - Few databases: Ovid MEDLINE, Cochrane Library, Epistemonikos.org
  - Study designs: Systematic Reviews, Randomized Controlled Trials, (non randomized controlled studies)
  - Only published literature
- **Templates** for question intake, search assignment, search strategy draft, documentation & reporting



# Request: Rapid evidence inventory

## Question:

*What standardized (validated) instruments exist to evaluate sociability in psychiatric populations?*

## Standard „shortcuts“:

- Ovid MEDLINE? ~~Cochrane Library, Epistemonikos.org~~
- Systematic Reviews? ~~Randomized Controlled Trials, (non-randomized controlled studies)~~
- Only published literature?

**First step:  
preliminary/scoping searches**



# Preliminary searching

- Conducted during the protocol phase to inform the further review process: topic refinement, identification of systematic reviews and potentially relevant primary studies, estimation of resources to perform the RR.
- Iterative: search for systematic reviews → highly precise searches to find few promising primary studies → citation-based searching

Examples: sources for electronic exploratory citation-based searching

- PubMed Similar Articles: <https://pubmed.ncbi.nlm.nih.gov/help/#similar-articles>
- Google Scholar (<https://scholar.google.com/>): cited by, related articles
- Connected Papers (<https://www.connectedpapers.com/>): citation-networks based on co-cited references & co-citing references

The Personal **Sociability** and Connections Scale (PeSCS): Development and initial assessment at a primary care facility

EK Symvoulakis, M Linardakis... - ... of Social **Psychiatry**, 2022 - journals.sagepub.com

... with scale **scores** examined as an indicator of convergent validity. A multivariate linear regression analysis was performed to examine the relationship of PeSC scale **score** with the ...

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# Request: Rapid evidence inventory

## Question:

*What standardized (validated) instruments exist to evaluate sociability in psychiatric populations?*

## Adapted search process:

- Databases for psychiatric tools: PSYINDEX Tests, APA PsycTests
- APA PsycInfo (Ebsco)
- Ovid MEDLINE: precision-focused search
- No limit to study designs or document types

**RRs should use the most relevant information sources for the topic**

## Search strategies

Recommendation for RRs	Different from SR guidance?
Use known relevant records for appropriate search terms	Sort of
Identify reusable search strategies/elements of search strategies	Sort of
Use limits and restrictions carefully	Sort of
When updating an existing review, assess the original search methods	No

**Opportunities to reduce the search result:** RR search strategies may focus on increasing search precision

# Quality assurance and search strategy peer review

Recommendation for RRs	Different from SR guidance?
Test if known relevant records are retrieved	Sort of
Review the primary search strategy	Sort of
Review the planned information sources and search methods	No

**Quality assurance is crucial:** Inappropriate sources/methods and errors have a greater impact in searches precision-focussed searches

McGowan J, Sampson M, Salzwedel DM, et al. PRESS peer review of electronic search strategies: 2015 guideline statement. *J Clin Epidemiol* 2016;75:40–6. doi:10.1016/j.jclinepi.2016.01.021



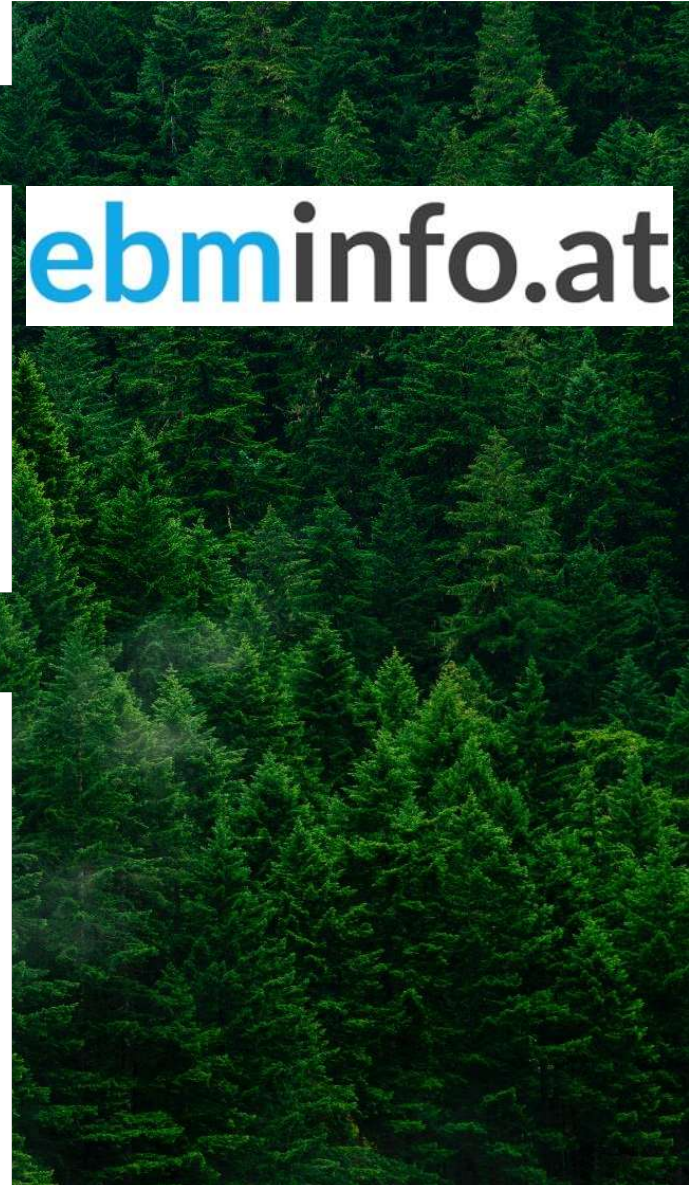
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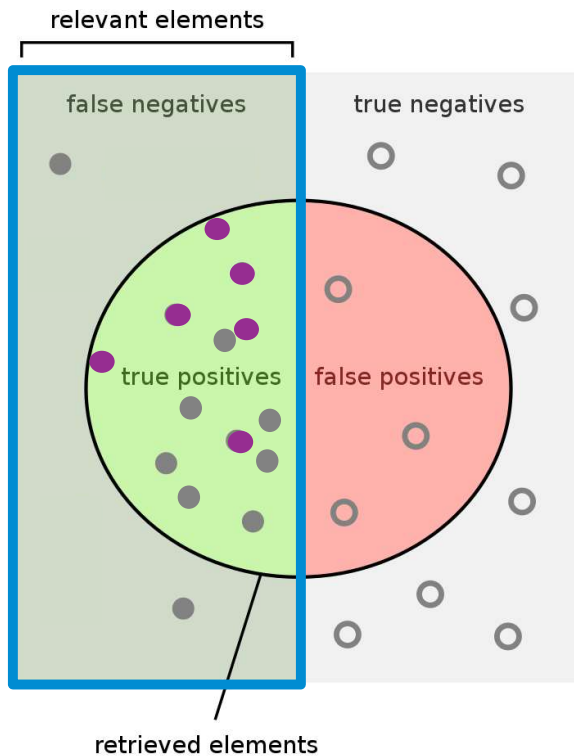
## **Example: Text analysis, improving precision, testing sensitivity**

*The many uses of known relevant records*

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# Sensitivity (Recall) & Precision



How many retrieved items are relevant?

$$\text{Precision} = \frac{\text{true positives}}{\text{true positives} + \text{false positives}}$$

How many relevant items are retrieved?

$$\text{Sensitivity/Recall} = \frac{\text{true positives}}{\text{true positives} + \text{false negatives}}$$

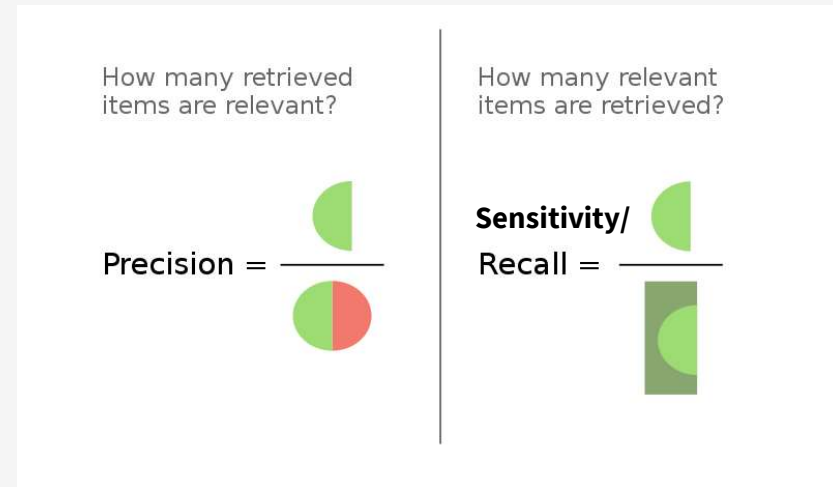
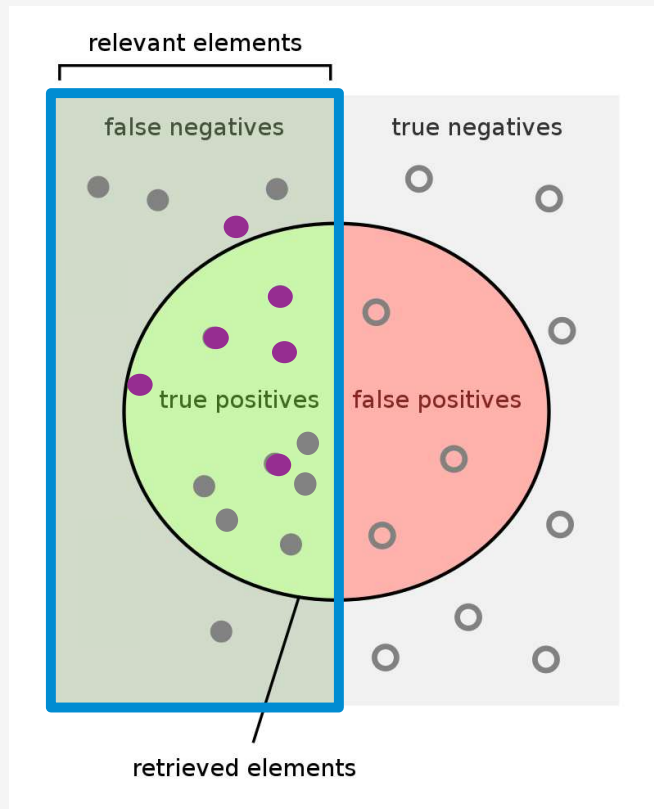
## Systematic searches:

Goal: high sensitivity → Low precision

## RR systematic searches:

may try to increase precision and accept (small) loss in sensitivity

# Sensitivity (Recall) & Precision



## Systematic searches:

Goal: high sensitivity → Low precision

## RR systematic searches:

may try to increase precision and accept (small) loss in sensitivity



# Request: Rapid Review

## Question:

*What is the effect of oral contraceptives on the exercise performance of adult women?*

## SRs can be further used in search development:

- Evaluation for re-use of search strategies
- Included studies as known relevant records

## Found by initial preliminary search

1: Elliott-Sale KJ, McNulty KL, Ansdell P, Goodall S, Hicks KM, Thomas K, Swinton PA, Dolan E. The Effects of Oral Contraceptives on Exercise Performance in Women: **A Systematic Review and Meta-analysis**. Sports Med. 2020 Oct;50(10):1785-1812. doi: 10.1007/s40279-020-01317-5. PMID: 32666247; PMCID: PMC7497464.

2: Elliott KJ, Cable NT, Reilly T. Does oral contraceptive use affect maximum force production in women? Br J Sports Med. 2005 Jan;39(1):15-9. doi:10.1136/bjism.2003.009886. Erratum in: Br J Sports Med. 2005 Mar;39(3):184. PMID:15618333; PMCID: PMC1725011.

3: Joyce S, Sabapathy S, Bulmer A, Minahan C. Effect of long-term oral contraceptive use on determinants of endurance performance. J Strength Cond Res.2013 Jul;27(7):1891-6. doi: 10.1519/JSC.0b013e3182736935. PMID: 22996028.

4: Bushman B, Masterson G, Nelsen J. Anaerobic power performance and the menstrual cycle: eumenorrheic and oral contraceptive users. J Sports Med Phys Fitness. 2006 Mar;46(1):132-7. PMID: 16596112.

5: Drake SM, Evetovich T, Eschbach C, Webster M. A pilot study on the effect of oral contraceptives on electromyography and mechanomyography during isometric muscle actions. J Electromyogr Kinesiol. 2003 Jun;13(3):297-301. doi:10.1016/s1050-6411(03)00024-5. PMID: 12706609.

6: Gordon D, Scruton A, Barnes R, Baker J, Prado L, Merzbach V. The effects of menstrual cycle phase on the incidence of plateau at  $\dot{V}O_2$ max and associated cardiorespiratory dynamics. Clin Physiol Funct Imaging. 2018 Jul;38(4):689-698. doi: 10.1111/cpf.12469. Epub 2017 Sep 14. PMID: 28906053.



# Text analysis for identification of search terms

Based on potentially relevant records found during preliminary searching

Examples of free tools:

- PubMed PubReMiner: <http://hgserver2.amc.nl/cgi-bin/miner/miner2.cgi>
  - ⇒ Pubmed/Medline, word-frequency of single terms & Mesh
- Systematic Review Accelerator, Word-frequency Analysis: <https://sr-accelerator.com/#/>
  - ⇒ Any RIS-file, weighted word frequency of single terms and phrases
- searchbuildR: <https://github.com/IQWiG/searchbuildR> (Download, R-Package with Shiny App)
  - ⇒ Any RIS-file but focus on Medline: identification overrepresented terms compared to random PubMed sample

# Sensitivity/Precision

- Categories of search terms based on relevance
  - Known relevants to test impact of adding/removing search terms
- ⇒ Example: Using only definites & probables finds 24/26 known relevants, but has a much smaller search result than using all potentially relevant search terms

	#	Searches	Results
Element 1: oral contraceptive use	1	exp Contraceptives, Oral/	51105
	2	(oral adj (contraceptiv* or estradiol or progesterone or progesterone)).ti,ab,kf.	27279
	3	1 or 2	60719
Element 2: exercise performance - definites	4	exp Athletic Performance/	59804
	5	exp Physical Endurance/	36115
	6	Exercise Test/	66882
	7	Muscle Strength/	24054
	8	(exercise adj2 (performance or response? or recovery or exhaustion or tolerance or test*)).ti,ab,kf.	57349
	9	(endurance adj1 (physical or performance or test*)).ti,ab,kf.	3974
	10	(fitness adj1 (physical or cardio*)).ti,ab,kf.	18970
	11	or/4-10	176527
<b>Result 1</b>	<b>12</b>	<b>3 and 11</b>	<b>236</b>
Element 2: exercise performance - probables	13	(peak adj4 (performance or output or capacity)).ti,ab,kf.	8172
	14	((anaerobic or aerobic) adj (capacity or power)).ti,ab,kf.	9049
	15	(vo2peak or vo2max or "v'o2peak" or "v'o2max").ti,ab,kf.	12988
	16	((max* or peak) adj2 (muscle action? or force production)).ti,ab,kf.	540
	17	(muscle adj (recovery or strength)).ti,ab,kf.	26673
	18	cardiorespiratory response.ti,ab,kf.	360
	19	or/13-18	53544
<b>Result 2</b>	<b>20</b>	<b>3 and (11 or 19)</b>	<b>267</b>
Element 2: exercise performance - possibles	21	exp Exercise/	226979
	22	exp Sports/	203054
	23	(exercise or sport? or physical* activ*).ti,kf.	221780
	24	or/21-23	426679
<b>Result 3</b>	<b>25</b>	<b>3 and (11 or 19 or 24)</b>	<b>698</b>
Known relevant records	26	("32666247" or "31663173" or "31686212" or "30167957" or "28906053" or "28497386" or "27898641" or "25694209" or "25519952" or "24504652" or "22996028" or "22948447" or "22446669" or "22403922" or "21848445" or "21399539" or "20227547" or "18054842" or "17990209" or "17157107" or "16596112" or "15598669" or "15618333" or "14707778" or "12706609" or "12381756").ui.	26
Found by R1	27	12 and 26	21
Found by R2	28	20 and 26	24
Found by R3	29	25 and 26	26

# Reporting and record management

Recommendation for RRs	Different form SR guidance?
Plan the record managing process	No
Use PRISMA-S to report RR searches	Maybe
Use reference management software and/or SR platforms	No

**Reporting/Documentation are unchanged:** Time can be saved by involvement of expert searchers and use of templates and standards

# Free tools and templates for documentation, record management, etc.

**Tools for the entire search process:** IEBH Systematic Review Accelerator: <https://sr-accelerator.com/#/>

⇒ Includes tools for text analysis, PubMed search strategy refinement, search strategy translation, deduplication of search results, citation searching, writing methods section

**Planning a search:** Wafford, Q. E., & O'Dwyer, L. C. (2021). Adopting a toolkit to manage time, resources, and expectations in the systematic review process: a case report. *Journal of the Medical Library Association*, 109(4), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8608198/>

⇒ Aimed at librarians/ISs: templates for communication with systematic reviewers and planning search process

**Documentation and peer review process of database searches:** Cochrane Effective Practice and Organisation of Care (EPOC). (2021). "Search audit template excel spreadsheet." <https://zenodo.org/record/5106380>

⇒ Excel template for planning, designing, documenting database searches

**Planning reviews and searches:** ILIAS Universität Bern: Templates (Concepts Sheet, PRISMA 2020 Flow Chart, PRESS checklist, Review Protocol): [https://ilias.unibe.ch/goto\\_ilias3\\_unibe\\_cat\\_2297224.html](https://ilias.unibe.ch/goto_ilias3_unibe_cat_2297224.html)

⇒ Collection of templates and checklists for the systematic review process, focused on protocol and searching



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# Discussion & questions

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