Cochrane Oral Health

MANCHESTER 1824
The University of Manchester

Systematic Reviews

(vs literature reviews)

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Trusted evidence.
Informed decisions.
Better health.

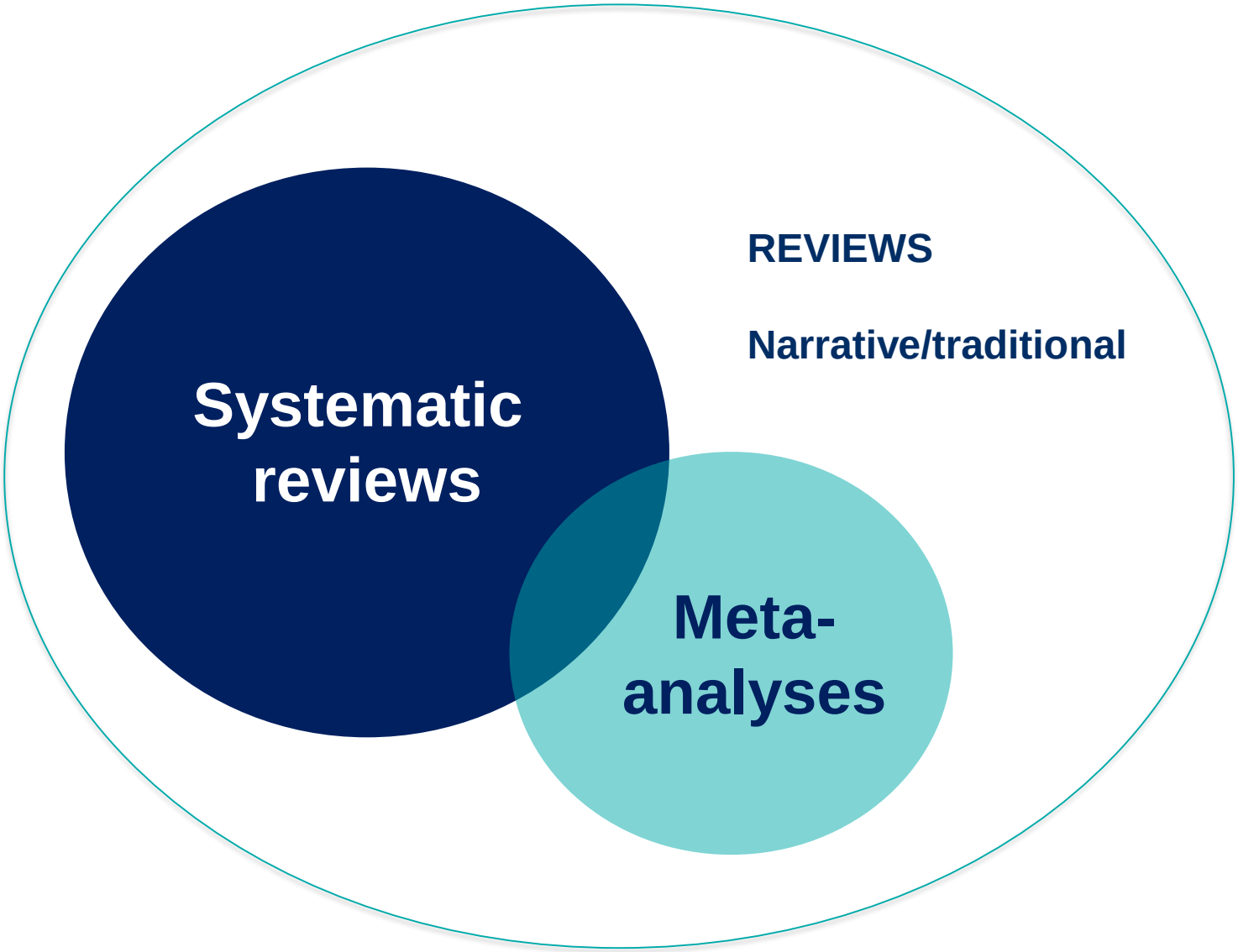
NHS
National Institute for Health Research

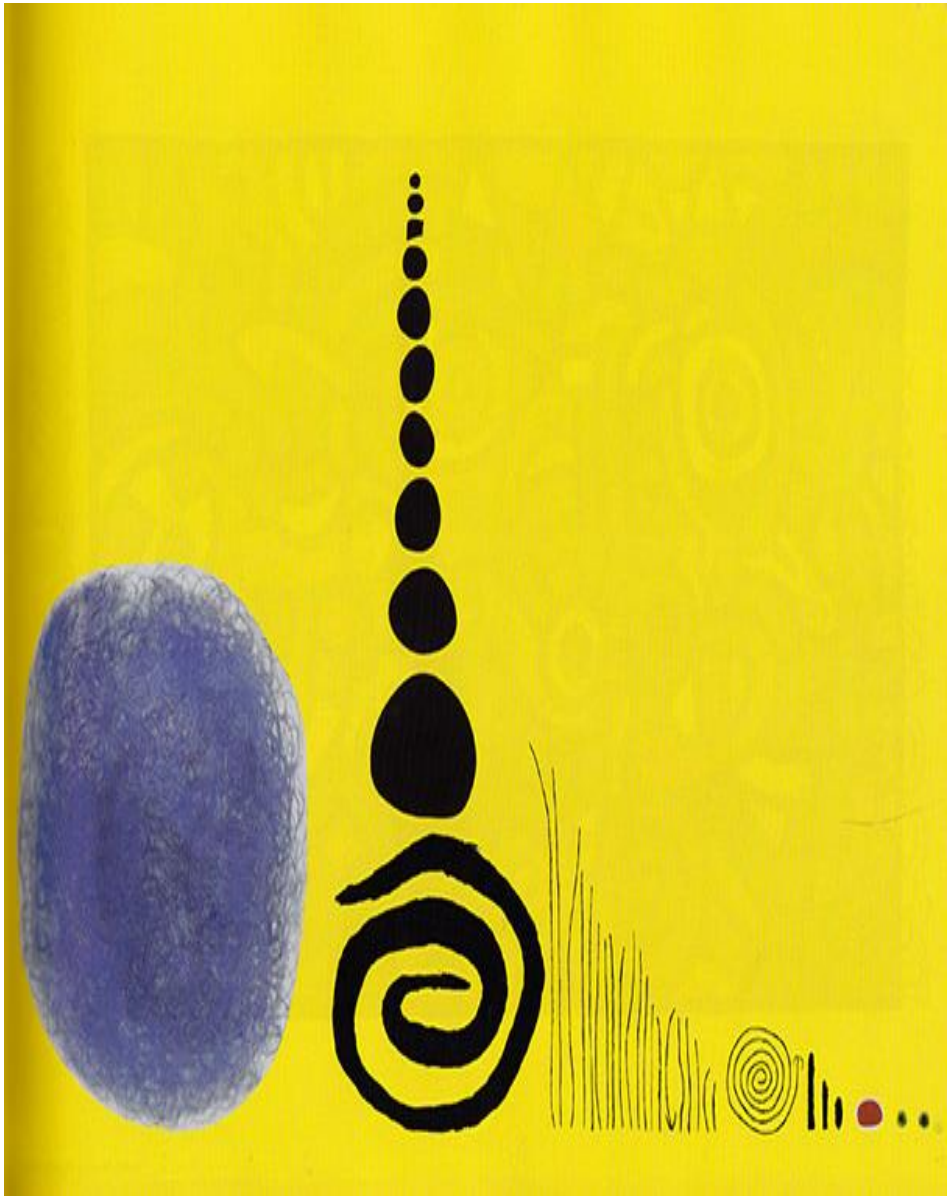
The National Institute for Health Research (NIHR) is
the largest single funder of Cochrane Oral Health

What are systematic reviews?

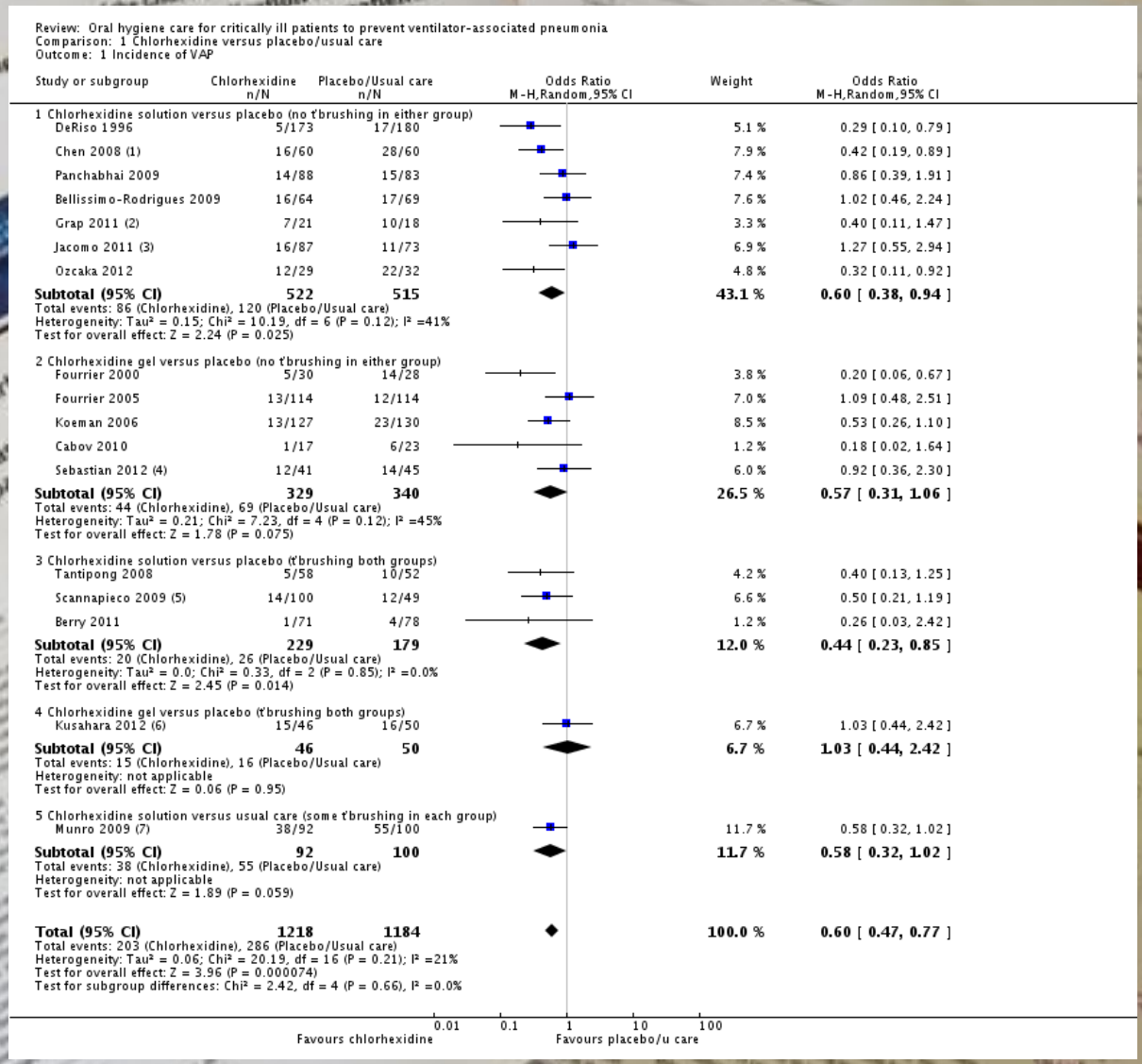
- A review that has a **clearly formulated question**, uses explicit methods to derive an answer to that question, based on relevant research evidence
- Systematically locating, appraising and synthesising evidence from scientific studies in order to obtain a reliable overview
- Aim to find all studies addressing the review's question using an objective and transparent process

Systematic review	Literature Review
Comprehensive overview of primary research addressing a focused question; follows a predefined protocol	Overview of a topic using unstructured approach


REVIEWS
Narrative/traditional
Systematic reviews
Meta-analyses

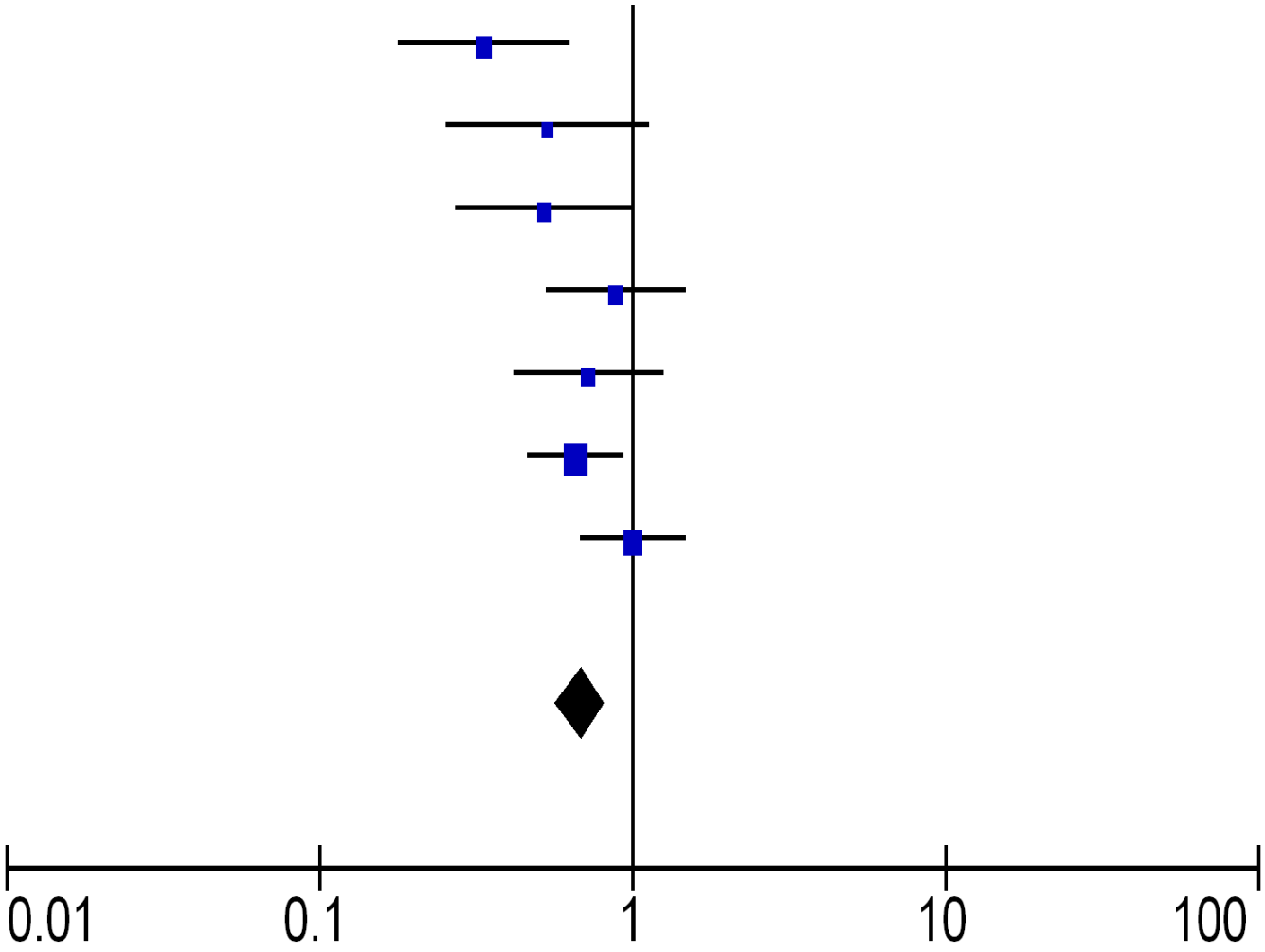


Review: Oral hygiene care for critically ill patients to prevent ventilator-associated pneumonia
Comparison: 1 Chlorhexidine versus placebo/usual care
Outcome: 1 Incidence of VAP



Why are systematic reviews important?

- Ensure that healthcare decisions are informed by high quality and timely research evidence
- Formulate policy and develop guidelines
- Reduce large quantities of information into manageable portions
- Efficient use of resources
- Increased power/precision
- Limit bias and improve accuracy


0.01
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Steps of a systematic review

1	**Define the question (PICO)**
2	Plan eligibility criteria
3	Plan methods
4	Search for studies
5	Apply eligibility criteria
6	Collect data
7	Assess studies for risk of bias
8	Analyse and present results
9	Interpret results and draw conclusions
10	Improve and update review

This question is…

- The lynchpin of a systematic review protocol
- Leads on to inclusion and exclusion criteria
- Helps build up a search strategy
- Gets authors thinking about what data to extract, and what quality criteria are important
- Allows authors to decide on their analysis now

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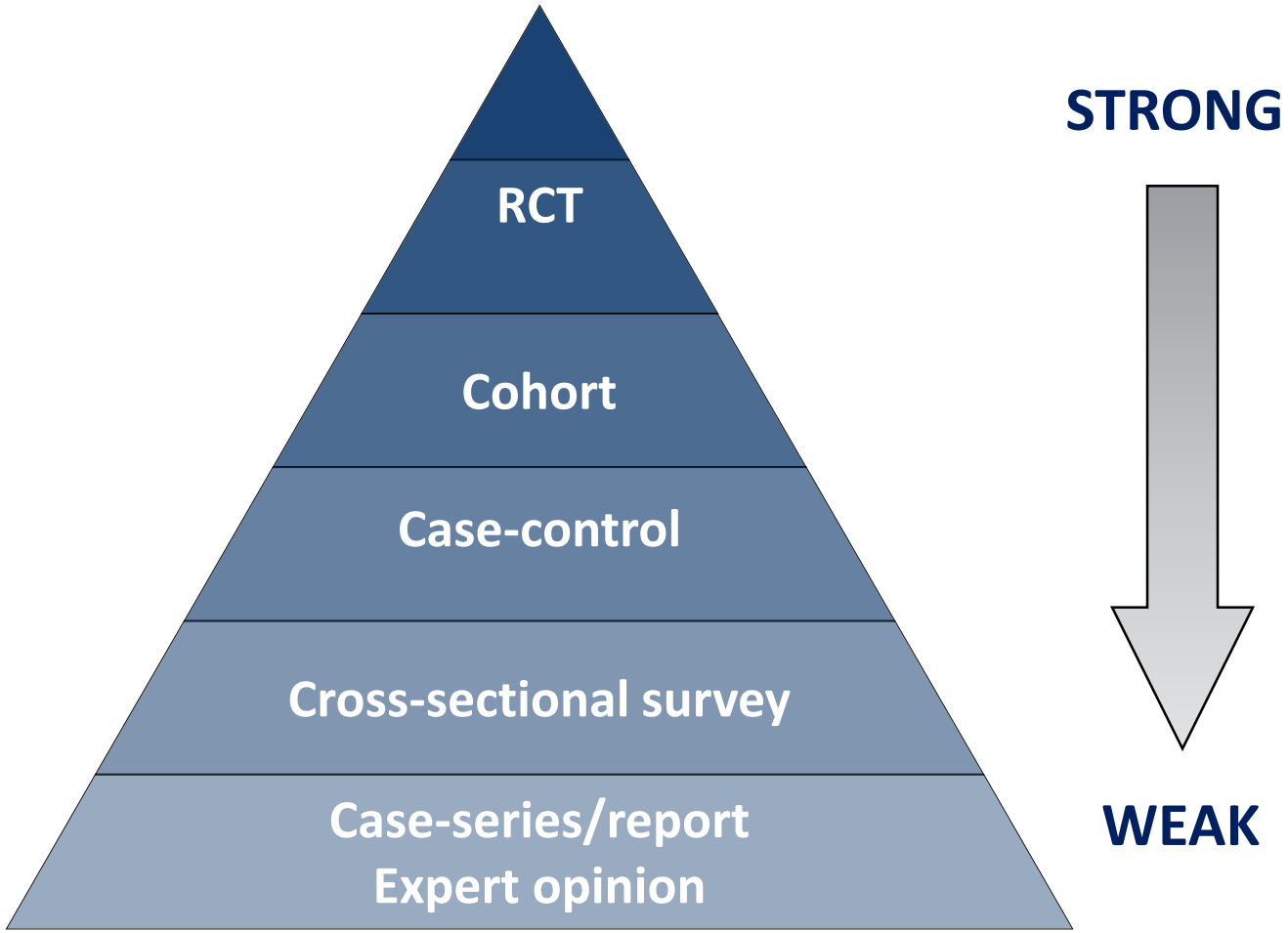
Hierarchy of evidence



Possible scenarios

- **Question not related to effectiveness of an intervention**
  - Adopting clinical genomics: a systematic review of genomic literacy among physicians in cancer care. (Dung Ha et al 2018)
  - Cost-utility analyses of diagnostic laboratory tests: a systematic review (Fang el al 2011)
  - Obesity-Related Genes and Oral cancer: A Bioinformatics Approach and Systematic Review (Santos et al, 2016)

- **RCTs not feasible in area of study**
  - Penicillins for the prophylaxis of bacterial endocarditis in dentistry. (*Oliver 2004*)

- **Supplement a review of RCTs**
  - Comparative efficacy and safety of long-acting oral opioids for chronic non-cancer pain: a systematic review. (*Chou 2003*)

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Search strategy

- Needs to be as comprehensive as possible
- **Consider:**
  - Electronic databases (Cochrane Controlled Trials Register, Medline, Embase);
  - Reference lists;
  - Handsearching;
  - English language/non-English language;
  - Sources of ongoing and/or unpublished studies

Reporting biases

- **Statistically significant 'positive' results are:**
  - more likely to be published
    - **publication bias**
  - more likely to be published rapidly
    - **time lag bias**
  - more likely to be published in English
    - **language bias**
  - more likely to be cited by others
    - **citation bias**

Publication bias

- Empirical evidence that positive results more likely to be published than negative results

  (Scherer 2007, Decullier 2005, Decullier 2007)

- ***OR = 3.90, 95% CI 2.68 to 5.68***

  (Hopewell 2008)

Publication bias | an example

- Systematic review of reboxetine, a third-generation anti-depressant
- 13 trials, published and unpublished data
- 74% of patient data previously unpublished
- Reboxetine is "*overall an ineffective and potentially harmful antidepressant*"
- Contradicts findings of previous reviews which considered only published data

Eyding 2010, BMJ

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Unbiased selection & data extraction process

- Selection of relevant papers
- Data extraction to a predefined data extraction form
- Process should be conducted independently by at least two reviewers

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Risk of bias assessment

- Process should be conducted independently by at least two reviewers
- Results of the assessment should be reflected in the analysis
- Can be used:
  - As a threshold for inclusion of studies;
  - As a possible explanation for differences in results between trials;
  - In sensitivity analyses;
  - As weights in statistical analysis of the results

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Study synthesis

- **Appropriate pooling**
  - qualitative (narrative)
  - quantitative (meta-analysis)

- Clear presentation of individual studies included in the review

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