Systematic Review

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Glossary

- Research synthesis = review of primary research on a given topic with a purpose of integrating the findings (creating generalizations, conflict resolution)

- Meta-analysis = a set of statistical methods for combining outcomes (effect sizes) across different data sets addressing the same research question to examine patterns of response across these data sets and sources of heterogeneity in outcomes.

- Systematic review = research synthesis on a precisely defined topic using explicit methods to identify, select, critically appraise, and analyse relevant research

Systematic Review?

- ✓ **Quantitative** : numbers
- ✓ **Systematic** : methodical
- ✓ **combining**: putting together
- ✓ **previous research**: what's already done
- ✓ **conclusions**:

Systematic Review vs Literature Review (Narrative Review)

Issues	Systematic Review	Literature Review
Question	Focused on a single question	Not necessarily focused on a single question, but may describe an overview
Protocol	A peer review protocol or plan is included	No protocol is included
Background	Provide summaries of the available literature on a topic	Provide summaries of the available literature on a topic
Objectives	Clear objectives are identified	Objectives may or may not be identified
Inclusion and Exclusion Criteria	Criteria stated before the review is conducted	Criteria not specified

Contd

Search Strategy	Comprehensive search conducted in a systematic way	Strategy not explicitly stated
Process of Selecting Articles	Usually clear and explicit	Not described in a literature review
Process of Evaluating Articles	Comprehensive evaluation of study quality	Evaluation of study quality may or may not be included
Process of Extracting Relevant Information	Usually clear and specific	Not clear or explicit
Results and Data Synthesis	Clear summaries of studies based on high quality evidence	Summary based on studies where the quality of the articles may not be specified. May also be influenced by the reviewer's theories, needs and belief
Discussion	Written by an expert or group of experts with a detailed and well grounded knowledge of the issues	Written by an expert or group of experts with a detailed and well grounded knowledge of the issues

Number of Systematic Review and Meta-analyses Published Each Year
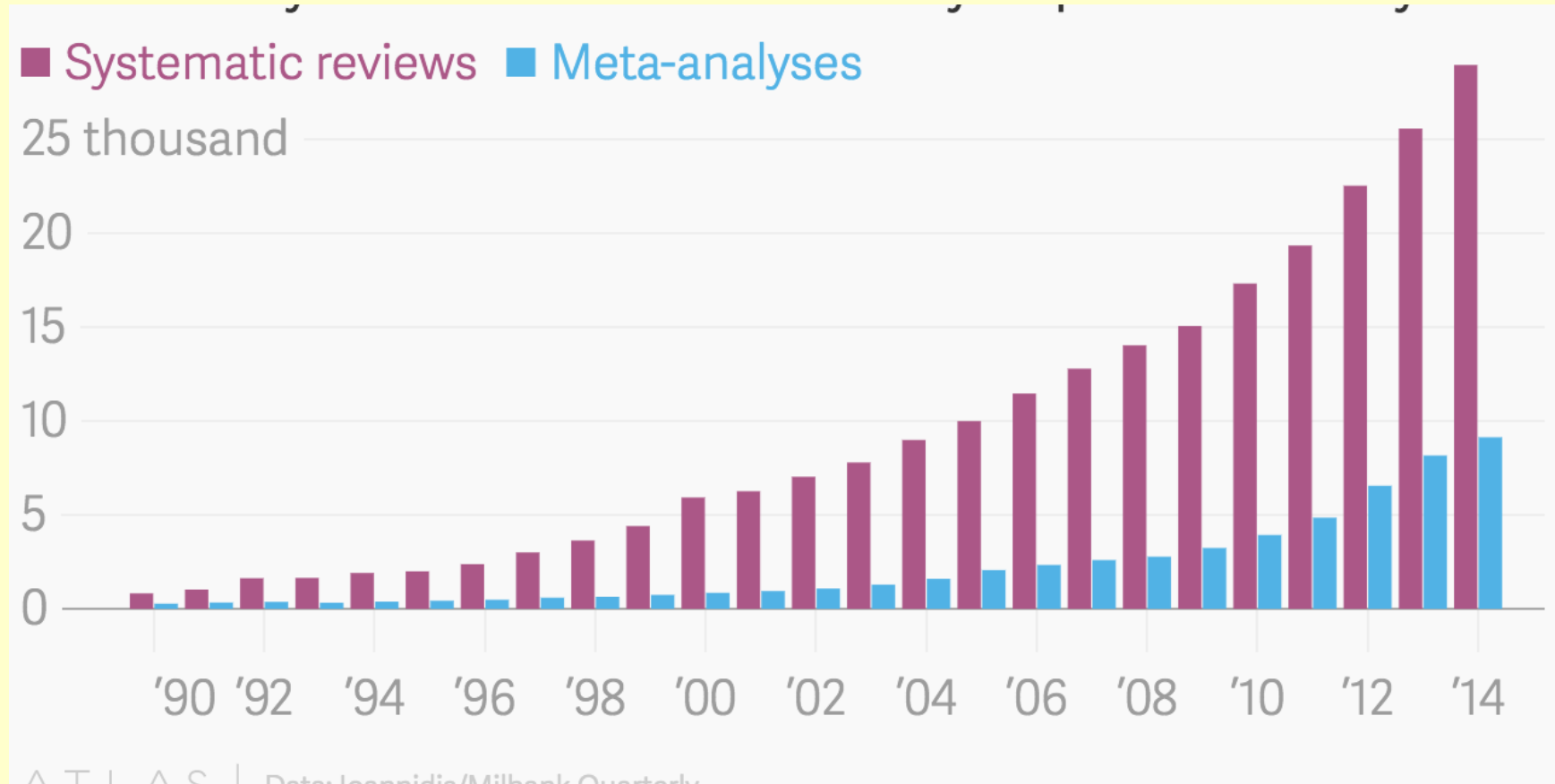
Source: Ioannidis (2016)

Why do a systematic review?

- undergraduate or postgraduate theses, grant proposals, and establishing research agendas. It will be most useful where:

- there is a substantive research question

- several empirical studies have been published

- there is uncertainty about the results

- to assess whether a treatment is effective or not.

Who will be involved?

- It is very difficult to perform a systematic review alone. The highest quality reviews will have input from experts in

- the subject being reviewed

- systematic review methodology

- information retrieval

- statistics

- other aspects e.g. health economics if required

- It is a team of collaborators

Formulate the problem. Has it been done before?

- ***a. Formulate the problem*** Clearly establish what your question is: consider using PICO:

- P=population   I=intervention   C=comparator   O=outcome

- What is a 5-year overall mortality (*outcome*) in adults with high levels of cholesterol (*population*) taking statins (*intervention*) compared with those treated with low fatdiet (*comparator*)?"

- What is the abundance (*outcome*) of breeding fish (*population*) on gear size (*intervention)* compared to nearby reference sites (*comparator*)?

- **b. Has this been done before?**

- To avoid wasting your time and energy, establish whether this question has already been answered in the published literature, or is registered as an ongoing review (check SR bodies in your field)

Data collection stage: sources

- Previous reviews on the topic
- Lists of references in retrieved studies
- Reference databases and search engines
  - keyword searches
  - cited references searches
- Hand search of selected journals
- Informal channels

Useful reference databases and search engines

- Web of Science

- Google Scholar

- JSTOR

- AGRICOLA

- Scopus (search engine for science-specific Web

- pages)

- Scirus (abstract and citation database)

- Conference Proceedings Citation Index

- Dissertation Abstracts online

Guide to keyword searches

- Use wildcard symbols (?, *) to capture alternative spellings or multiple derivations of

- words of interest

- Use Boolean operators (AND, OR, NOT) to combine keywords and restrict your

- search to the most relevant hits

Literature search and study selection
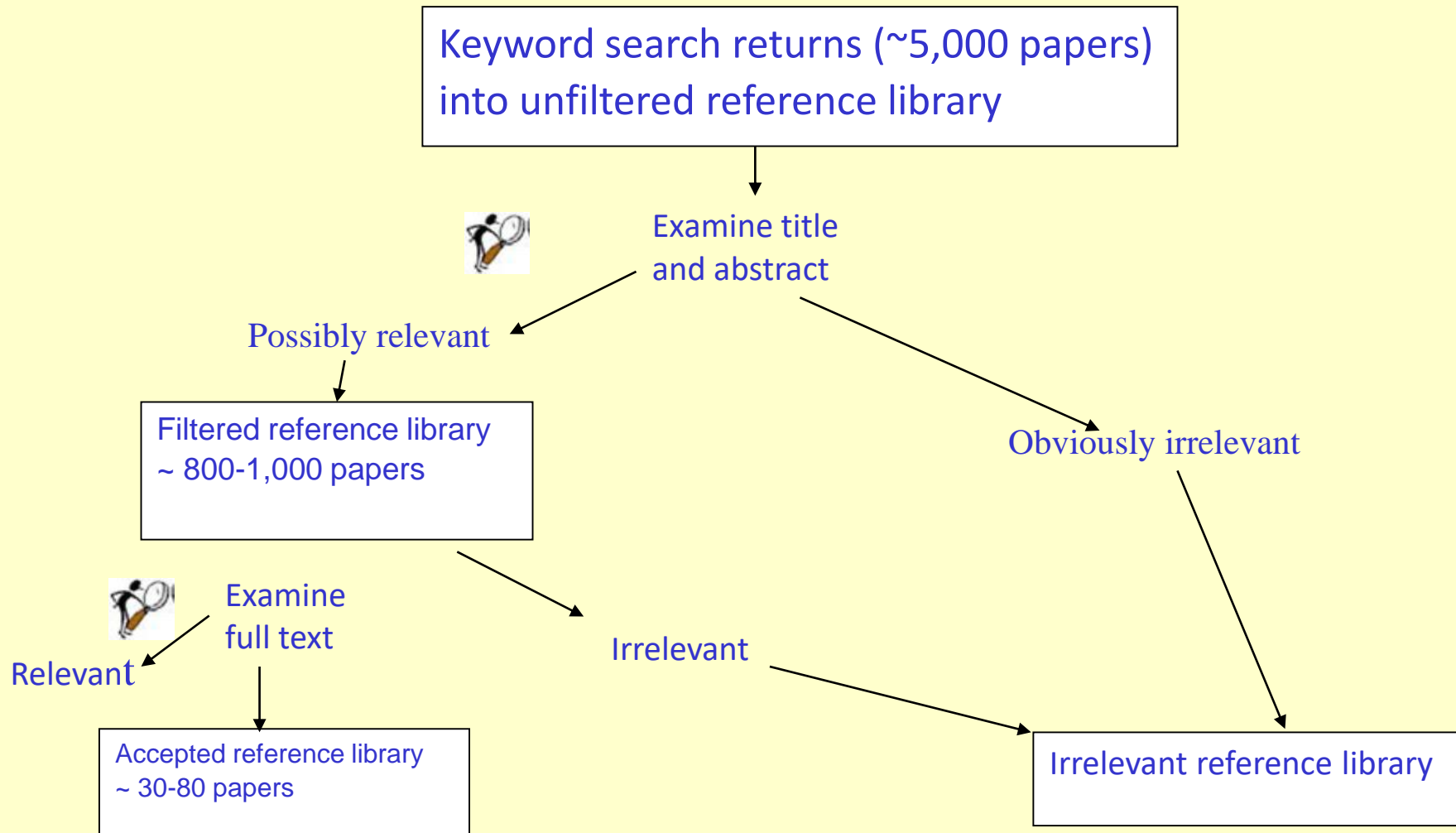
Inclusion criteria

Should be formulated a priori, but might need to be modified after initial search
• Should be closely linked to the research question,
e.g.:
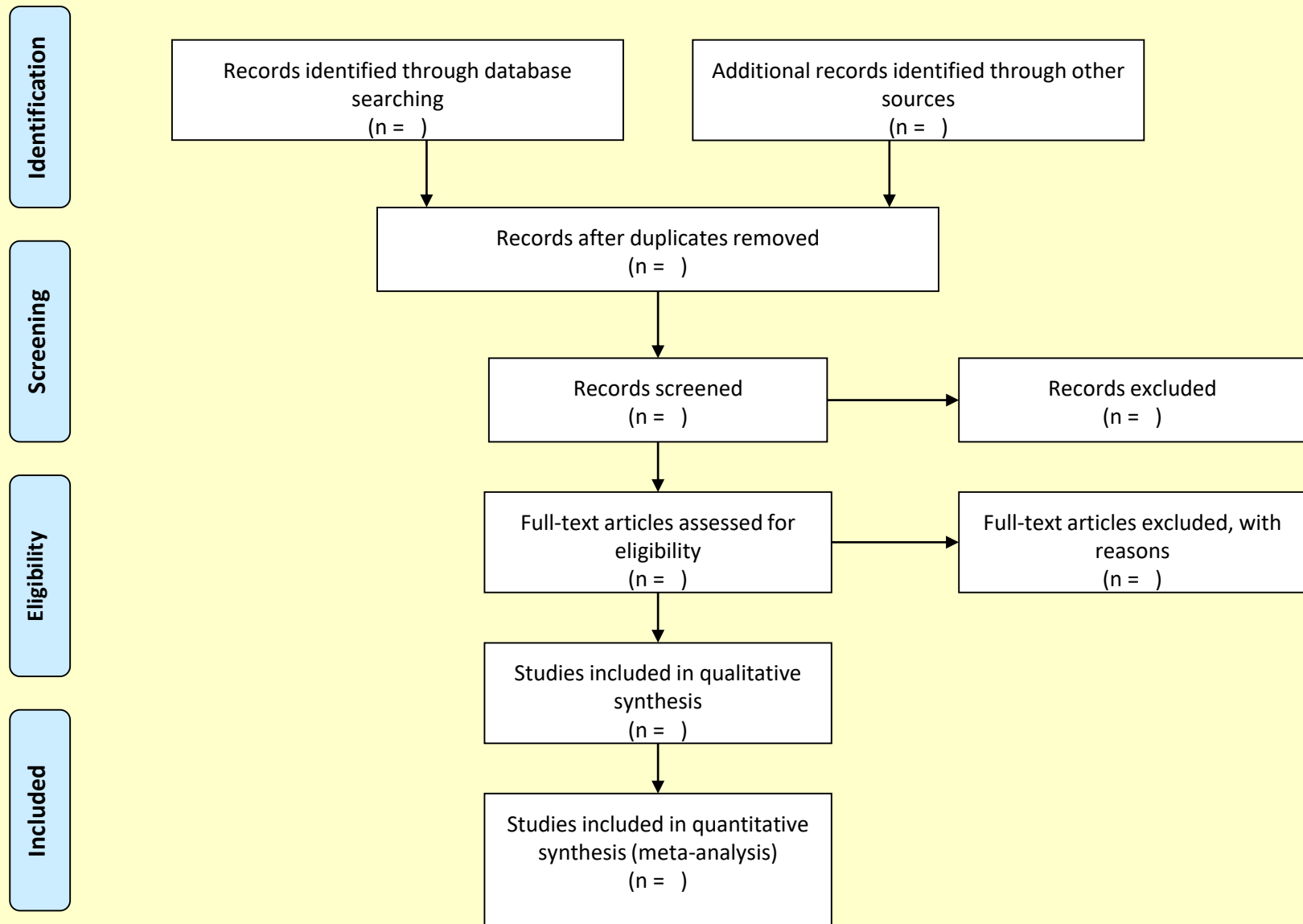✓ P=any fish species
✓ I=gear size
✓ C=reference areas/predevelopment
✓ O=population size, mortality rate
• The aim is to make study selection unbiased and repeatable

Example of a flat file

Study	Species	Taxon	Habitat	Status	Source
Akintola (2013)	M. vollenhovenii	Prawn	Freshwater	Permanent	Table 1
Akintola et al (2014)	P. monodon	Shrimp	Marine	Temporary	Fig. 2
Anetekhai et al (2004)	M. vollenhovenii	Prawn	Freshwater	Permanent	Table 3
Fakoya et al (2016)	L. goreensis	Fin fish	Brackish	Temporary	Pg 2

Result

Identification		
	Records identified through database searching (n =)	Additional records identified through other sources (n =)

Records after duplicates removed (n =   )

Screening

Records screened (n =   ) → Records excluded (n =   )

Eligibility

Full-text articles assessed for eligibility (n =   ) → Full-text articles excluded, with reasons (n =   )

Studies included in qualitative synthesis (n =   )

Included

Studies included in quantitative synthesis (meta-analysis) (n =   )

PRISMA stands for Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Discussion

Summary of evidence:

Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key stakeholders (e.g., academics, NGOs, fishers and policy makers)

Limitations:

Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).

Conclusions:

Provide a general interpretation of the results in the context of other evidence, and implications for future research.

Others

Acknowledgements

Funding information

And …..

Summarizing...

. **Defined systematic review**

. **Outlined basic steps**

  – **Information retrieval**

  – **Data Abstraction**

  – **Data Analysis**

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