



Search strategy for a Systematic review

CMB webinar 13 May 2020



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Contents

- What is a systematic review
- Protocol and preparation
- Search strategy PubMed
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- Help

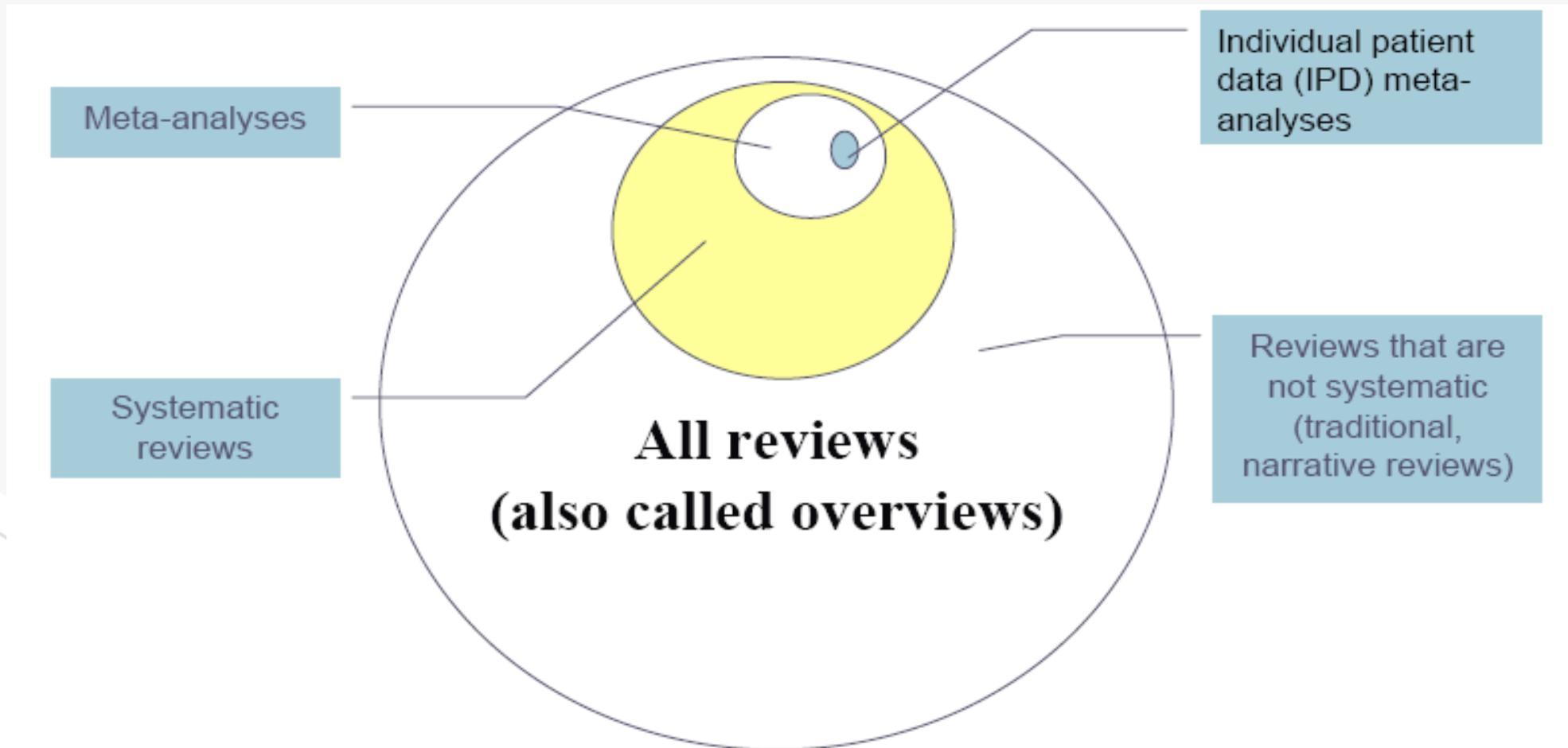


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Types of reviews



Systematic reviews (Cochrane def.)

“Systematic reviews seek to collate evidence that fits pre-specified eligibility criteria in order to answer a specific research question. They aim to minimize bias by using explicit, systematic methods documented in advance with a protocol.”

Chandler J, Cumpston M, Thomas J, Higgins JPT, Deeks JJ, Clarke MJ. Chapter I: Introduction. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA (editors). Cochrane Handbook for Systematic Reviews of Interventions version 6.0 (updated August 2019). Cochrane, 2019. Available from www.training.cochrane.org/handbook.

Characteristics systematic review (SR)

1. Specific research question (PICO/PECO) and clear inclusion criteria
2. Extensive search strategy: transparent and reproducible
3. Critical appraisal: quality/ risk of bias assessment of included studies
4. Data extraction and processing
5. Analysis & interpretation
6. Reporting according to (PRISMA) guidelines

Why make a SR protocol?

- It forces to think carefully about the research question and method
- Protocol prevents the method from being modified afterwards
- Higher quality
- The protocol can be registered, for example in PROSPERO. Other researchers will see you are working on this review and they will not do the same thing.

NB Creating and registering a protocol is not mandatory

How to write a protocol? PRISMA-P

<http://www.prisma-statement.org/Extensions/Protocols.aspx>

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

| Section and topic | Item No | Checklist item |
|-----------------------------------|---------|---|
| ADMINISTRATIVE INFORMATION | | |
| Title: | | |
| Identification | 1a | Identify the report as a protocol of a systematic review |
| Update | 1b | If the protocol is for an update of a previous systematic review, identify as such |
| Registration | 2 | If registered, provide the name of the registry (such as PROSPERO) and registration number |
| Authors: | | |
| Contact | 3a | Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author |
| Contributions | 3b | Describe contributions of protocol authors and identify the guarantor of the review |
| Amendments | 4 | If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments |
| Support: | | |
| Sources | 5a | Indicate sources of financial or other support for the review |
| Sponsor | 5b | Provide name for the review funder and/or sponsor |
| Role of sponsor or funder | 5c | Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol |
| INTRODUCTION | | |
| Rationale | 6 | Describe the rationale for the review in the context of what is already known |
| Objectives | 7 | Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) |
| METHODS | | |
| Eligibility criteria | 8 | Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review |
| Information sources | 9 | Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage |
| Search strategy | 10 | Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated |
| Study records: | | |
| Data management | 11a | Describe the mechanism(s) that will be used to manage records and data throughout the review |

PROSPERO: a register of SR protocols

<https://www.crd.york.ac.uk/prospero/>

NIHR | National Institute
for Health Research

PROSPERO
International prospective register of systematic reviews

[Home](#) | [About PROSPERO](#) | [How to register](#)

[Search](#) | [Log in](#) | [Join](#)

Click to **show your search history and hide search results**. Open the **Filters** panel to find records with specific characteristics (e.g. all reviews about cancer or all diagnostic reviews etc)

Q "2019 nCoV" OR 2019nCoV OR "2019 novel coronavirus" ✕

Go

MeSH

Clear filters

Show filters

[First](#) [Previous](#) [Next](#) [Last](#) (page 1 of 5)

245 records found for "2019 nCoV" OR 2019nCoV OR "2019 novel coronavirus" OR "COVID 19" OR COVID19 OR "new coronavirus" OR "novel coronavirus" OR "SARS CoV-2" OR (Wuhan AND coronavirus) OR "COVID 19" OR "SARS-CoV" OR "2019-nCoV" OR "SARS-CoV-2" NOT Animal:DB

[Show checked records only](#) | [Export](#)

| <input type="checkbox"/> | Registered | Title | Type | Review status |
|--------------------------|------------|--|------|----------------|
| <input type="checkbox"/> | 09/04/2020 | A living systematic review of clinical trials assessing the effectiveness of interventions, compared to standard care, for patients with COVID-19 [CRD42020178090] | | Review Ongoing |
| <input type="checkbox"/> | 09/04/2020 | A rapid systematic review of non-invasive ventilation for the care of patients infected with COVID-19 [CRD42020178187] | | Review Ongoing |
| <input type="checkbox"/> | 08/04/2020 | A systematic review and meta-analysis of clinical, imaging, and laboratory findings in pediatric patients with COVID-19 [CRD420201775571] | | Review Ongoing |

Good preparation



<https://www.needpix.com/photo/966468/ready-prepared-preparation-readiness-preparedness-free-pictures-free-photos-free-images-royalty-free>

Preparation

- Read in well, o.a. PRISMA E&E (see last slide for url)
- Define your preliminary research question
- Check if systematic reviews with a similar research question already have been published
- Check if protocols with a similar research question have been published in PROSPERO
- Try to find relevant studies for your topic:
make a list of (pmid's of) relevant studies
- Define the **final research question** and the **inclusion criteria**
- Start with the search strategy

Inclusion criteria: like a PICO in detail

see PRISMA E&E, item 6

The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Car...

Alessandro Liberati, Douglas G. Altman, Jennifer Tetzlaff, Cynthia Mulrow, Peter C. Gøtzsche, John P. A. Ioannidis, Mike Clarke, ...

Item 6: ELIGIBILITY CRITERIA.

Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.

Examples. *Types of studies:* "Randomised clinical trials studying the administration of hepatitis B vaccine to CRF [chronic renal failure] patients, with or without dialysis. No language, publication date, or publication status restrictions were imposed..."

Types of participants: "Participants of any age with CRF or receiving dialysis (haemodialysis or peritoneal dialysis) were considered. CRF was defined as serum creatinine greater than 200 µmol/L for a period of more than six months or individuals receiving dialysis (haemodialysis or peritoneal dialysis)...Renal transplant patients were excluded from this review as these individuals are immunosuppressed and are receiving immunosuppressant agents to prevent rejection of their transplanted organs, and they have essentially normal renal function..."

Types of intervention: "Trials comparing the beneficial and harmful effects of hepatitis B vaccines with adjuvant or cytokine co-interventions [and] trials comparing the beneficial and harmful effects of immunoglobulin prophylaxis. This review was limited to studies looking at active immunization. Hepatitis B vaccines (plasma or recombinant (yeast) derived) of all types, dose, and regimens versus placebo, control vaccine, or no vaccine..."

Types of outcome measures: "Primary outcome measures: Seroconversion, ie, proportion of patients with adequate anti-HBs response (>10 IU/L or Sample Ratio Units). Hepatitis B infections (as measured by hepatitis B core antigen (HBcAg)

Abstract

Introduction

The QUOROM Statement
and Its Evolution into
PRISMA

Development of PRISMA

Scope of PRISMA

How To Use This Paper

The PRISMA Checklist

Additional Considerations
for Systematic Reviews of
Non-Randomized

Intervention Studies or for
Other Types of
Systematic Reviews

Discussion

Supporting Information

Acknowledgments

Author Contributions

References

Example

What is the effectiveness of influenza vaccination of health workers on influenza and mortality of the elderly in institutions or hospitals for long-term care?

PICO and concepts

| | |
|--------------|--|
| Population | = health care workers |
| Intervention | = influenza vaccination |
| Control | = no influenza vaccination |
| Outcome | = influenza and mortality of the elderly |
| Study type | = randomized controlled trials |

Concepts (parts that are relevant to the search strategy):

1. health care workers
2. Influenza
3. Vaccination
4. Elderly

Recap: characteristics systematic search:

- The search strategy is build in *strings* per concept
- Each *string* contains both MeSH and free text [tiab]. Within a string, use operator OR. Between strings, use operator AND.
- Build your strategies in Word.
- Consider spelling, synonyms, truncation, truncatie e.g. (tumor*[tiab] OR tumour*[tiab] OR ..)
- Avoid default filters or limits, like 'Humans'
- Search more databases, for example PubMed, Cochrane Library and Embase

How to start with your search strategy: collect search terms

- Use your list of relevant articles
See this list as a sample of all the articles you want to find
- Use this list to collect search terms: screen the titles, abstracts and view the MeSH that index the articles
- Write down per concept: MeSH and all variations of search terms observed in titles and abstracts

[J Am Geriatr Soc. 2009 Sep;57\(9\):1580-6. doi: 10.1111/j.1532-5415.2009.02402.x. Epub 2009 Aug 4.](#)

[Effect of influenza vaccination of nursing home staff on mortality of residents: a cluster-randomized trial.](#)

Abstract

OBJECTIVES:

To evaluate the effect of staff influenza vaccination on all-cause mortality in nursing home residents.

DESIGN:

Pair-matched cluster-randomized trial.

SETTING:

Forty nursing homes matched for size, staff vaccination coverage during the previous season, and resident disability index.

PARTICIPANTS:

All persons aged 60 and older residing in the nursing homes.

INTERVENTION:

Influenza vaccine was administered to volunteer staff after a face-to-face interview. No intervention took place in control nursing homes.

MEASUREMENTS:

The primary endpoint was total mortality rate in residents from 2 weeks before to 2 weeks after the influenza epidemic in the community. Secondary endpoints were rates of hospitalization and influenza-like illness (ILI) in residents and sick leave from work in staff.

RESULTS:

Staff influenza vaccination rates were 69.9% in the vaccination arm versus 31.8% in the control arm. Primary unadjusted analysis did not show significantly lower mortality in residents in the vaccination arm (odds ratio=0.86, $P=.08$), although multivariate-adjusted analysis showed 20% lower mortality ($P=.02$), and a strong correlation was observed between staff vaccination coverage and all-cause mortality in residents (correlation coefficient=-0.42, $P=.007$). In the vaccination arm, significantly lower resident hospitalization rates were not observed, but ILI in residents was 31% lower ($P=.007$), and sick leave from work in staff was 42% lower ($P=.03$).

CONCLUSION:

These results support influenza vaccination of staff caring for institutionalized elderly people.

[J Am Geriatr Soc. 2009 Sep;57\(9\):1580-6. doi: 10.1111/j.1532-5415.2009.02402.x. Epub 2009 Aug 4.](#)

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CONCLUSION:

These results support influenza vaccination of staff caring for institutionalized elderly people.

MeSH for 1. health care workers; 2. Influenza; 3. Vaccination; 4. Elderly

MeSH terms

Aged

Aged, 80 and over

Cause of Death

Disability Evaluation

Disease Outbreaks/prevention & control*

Disease Outbreaks/statistics & numerical data

Female

France

Homes for the Aged/statistics & numerical data*

Humans

Immunization Programs

Infectious Disease Transmission, Professional-to-Patient/prevention & control*

Infectious Disease Transmission, Professional-to-Patient/statistics & numerical data

Influenza Vaccines/administration & dosage*

Influenza, Human/mortality

Influenza, Human/nursing*

Influenza, Human/prevention & control*

Influenza, Human/transmission

Male

Matched-Pair Analysis

Nursing Homes/statistics & numerical data*

Nursing Staff/statistics & numerical data*

Sick Leave

Survival Analysis

Substance

Influenza Vaccines

Make a (scrap) table of search terms

| | Health care workers | Influenza | vaccination | elderly |
|---------------|---|--|---|---|
| MeSH | "Health Personnel"[Mesh] | "Influenza, Human"[Mesh] "Influenza Vaccines"[Mesh] | "Vaccination" [Mesh] "Influenza Vaccines" [Mesh] "Immunization Programs"[Mesh] | "Aged" [Mesh] "Homes for the Aged"[Mesh] <i>"Nursing Homes"[Mesh]</i> |
| [tiab] | Health care workers Healthcare workers Staff Personnel | Influenza flu | vaccination vaccine vaccinated immunization | elderly older people older patients older persons Older residents senior old age geriatric |

Find MeSH in MeSH database: check the definition and the tree. Add to the builder.



A service of the National Library of Medicine
and the National Institutes of Health

All MeSH Categories

Persons Category

Persons

Age Groups

Adult

Aged

Aged, 80 and over
Frail Elderly

"Aged"[Mesh] includes
Aged, 80 and over and
frail elderly

PubMed search strategy in Word

("Health Personnel"[Mesh] OR personnel[tiab] OR staff[tiab] OR healthcare worker*[tiab] OR health care worker*[tiab] OR health worker*[tiab])

- *Within a concept: use **OR***
- *Use one bracket at the start and one bracket at the end*

AND

("Influenza, Human"[Mesh] OR "Influenza Vaccines"[Mesh] OR influenza*[tiab] OR flu[tiab])

AND

*Between concepts: use **AND***

("Vaccination"[Mesh] OR "Immunization Programs"[Mesh] OR "Vaccines"[Mesh] OR vaccin*[tiab] OR immunization*[tiab] OR immunisation*[tiab])

AND

("Aged"[Mesh] OR "Homes for the Aged"[Mesh] OR elderly[tiab] OR senior*[tiab] OR older patient*[tiab] OR older people[tiab] OR older ag*[tiab] OR old age[tiab] OR older adult*[tiab] OR older residents[tiab] OR geriatr*[tiab])

PubMed alternative search notation (`nested' search)

("Health Personnel"[Mesh] OR personnel[tiab] OR staff[tiab] OR healthcare worker*[tiab] OR health care worker*[tiab] OR health worker*[tiab] OR personnel[tiab])

AND

("Influenza Vaccines"[Mesh] OR (("Influenza, Human"[Mesh] OR influenza*[tiab] OR flu[tiab]) **AND** ("Vaccination"[Mesh] OR "Immunization Programs"[Mesh] OR "Vaccines"[Mesh] OR vaccin*[tiab] OR immunization*[tiab] OR immunisation*[tiab])))

AND

("Aged"[Mesh] OR "Homes for the Aged"[Mesh] OR elderly[tiab] OR senior*[tiab] OR older patient*[tiab] OR older people[tiab] OR older ag*[tiab] OR old age[tiab] OR older adult*[tiab] OR older residents[tiab] OR geriatr*[tiab])

Check if all relevant titles are retrieved with the strategy, via Advanced. Tip: use Clipboard (#0)

| Recent queries | | | | |
|--------------------|---------------------|---|-------------|----------|
| Search | Add to builder | Query | Items found | Time |
| #3 | Add | Search (#0 NOT #1) | <u>0</u> | 10:56:55 |
| #2 | Add | Search (#0 AND #1) | <u>5</u> | 10:56:38 |
| #1 | Add | Search ("Health Personnel"[Mesh] OR personnel[tiab] OR staff[tiab] OR healthcare worker*[tiab] OR health care worker*[tiab] OR health worker*[tiab] OR personnel[tiab]) AND ("Influenza, Human"[Mesh] OR "Influenza Vaccines"[Mesh] OR influenza*[tiab] OR flu[tiab]) AND ("Vaccination"[Mesh] OR "Immunization Programs"[Mesh] OR "Vaccines"[Mesh] OR vaccin*[tiab] OR immunization*[tiab] OR immunisation*[tiab]) AND ("Aged"[Mesh] OR "Homes for the Aged"[Mesh] OR elderly[tiab] OR senior*[tiab] OR older patient*[tiab] OR older people[tiab] OR older ag*[tiab] OR old age[tiab] OR older adult*[tiab] OR older residents[tiab] OR geriatr*[tiab]) | <u>783</u> | 10:56:21 |
| #0 | Add | pubmed clipboard | <u>5</u> | 10:55:40 |

In the history above you can see that all items on the Clipboard are retrieved with the search strategy, because the number of overlapping items between (#0 AND #1) is five.

How do you know if you have a good strategy?

- it must be sensitive enough (you don't want to miss anything) and the number of items to screen has to be acceptable
- How do you check sensitivity (recall, completeness):
 - **Check other search strategies**
 - **Check references**
 - **Check 'similar articles'**
 - **Ask an information specialist**
 - **Ask a colleague/peer**
- If a relevant article is not retrieved: find out what is the problem and adjust the search
- Transparent and reproducible, technically correct

Specific tips

- How to 'safely' search for humans (avoiding limits)?
... NOT ("Animals"[Mesh] NOT "Humans"[Mesh])
- Can I use NOT to exclude terms?
Not recommend, serious risk to exclude relevant studies too.
- How to search for Adults as an age group?
Do not use Adults in the search strategy. Remove the irrelevant age groups in the screening. You can include Elderly or Children in the strategy.
In rare situations, such as ADHD in adults, exclude child-studies:
... NOT (("Child"[Mesh] OR "Adolescent"[Mesh]) NOT "Adult"[Mesh])
- How can I search for a specific study design?
Use a search string. There are also validated filters that may be useful.
Not-validated example for RCTs:
("Randomized Controlled Trial" [Publication Type] OR random*[tiab] OR trial[ti])
- Ask the CMB for 'filters' or search blocks.

What databases

<https://libguides.rug.nl/medicine/home/databases>

- MEDLINE (PubMed)
- Embase (embase.com)
- Cochrane Library
- CINAHL (EBSCOhost)
- PsycINFO (EBSCOhost)
- Web of Science (Clarivate analytics)
- Scopus (Elsevier)
- Google Scholar (*not systematic, not reproducible*)

Additional search methods

- always: check references!
- sometimes: grey literatuur
 - trials registers
 - meeting abstracts
 - Theses
 - Reports and documents of e.g. WHO
 - Email authors
 - Facebook groups etc.
- Sometimes: 'handsearching'
- Google

Translate the search strategy to other databases

- Embase, PsycINFO and CINAHL have their own thesaurus with index terms. Use this and find and replace the MeSH with the correct term and code.
- Web of Science does not have a thesaurus, only use free text words
- Basically keep free text words the same between databases. Customize database-specific formats and field codes (check the 'Help' of databases).

PubMed notations

| | |
|--|--|
| "heart rate"[MeSH] | MeSH, exploded |
| "heart rate"[MeSH:NoExp] | MeSH, not exploded |
| heart rate*[tiab] Heart [au] Heart[ti] | Title, abstract, author-keywords Author |
| AND, OR, NOT | Boolean operators |

Embase (embase.com)

| | |
|---------------------|---------------------------|
| 'heart rate'/exp | EMTREE term, exploded |
| 'heart rate'/de | EMTREE term, not exploded |
| 'heart rate*':ab,ti | Title, abstract |
| heart:au | Author |
| AND, OR, NOT | Boolean operators |
| NEXT/n | Proximity operators |
| NEAR/n | |

Cinahl (EBSCO)

| | |
|---|--|
| (MH "Heart Rate+") (MH "Heart Rate") | Cinahl headings, exploded Cinahl headings, not exploded |
| TI "heart rate*" or "AB heart rate*" "heart rate*" | Title, abstract field not specified |
| AND, OR, NOT NEAR, WITHIN | Boolean operators Proximity operators |

Translation of PubMed to EMBASE:

1. Copy the PubMed strategy to a new document in Word
2. Find and Replace (CTRL+H): [tiab] , replace with nothing
3. Add an apostrophe to all combinations of search terms, for example 'health care worker*'
4. Replace every single MeSH with the appropriate Emtree term (Browse, then go to Emtree), for example 'health care personnel'/exp
5. Add the field code :ab,ti to free text words. The field code can be added to a group of terms, for example ('health worker'* OR 'health care worker*' OR 'healthcare worker*'):ab,ti
6. Check if the operators and parentheses are placed correctly. Consider using proximity operators, for example (old* NEXT/3 (person* OR patient* OR people)):ab,ti finds *older patients*, but also *older primary care patients*

MEDLINE (Pubmed)

("Health Personnel"[Mesh] OR personnel[tiab] OR staff[tiab] OR healthcare worker*[tiab] OR health care worker*[tiab] OR health worker*[tiab])

AND

("Influenza, Human"[Mesh] OR "Influenza Vaccines"[Mesh] OR influenza*[tiab] OR flu[tiab])

AND

("Vaccination"[Mesh] OR "Immunization Programs"[Mesh] OR "Vaccines"[Mesh] OR vaccin*[tiab] OR immunization*[tiab] OR immunisation*[tiab])

AND

("Aged"[Mesh] OR "Homes for the Aged"[Mesh] OR elderly[tiab] OR senior*[tiab] OR older patient*[tiab] OR older people[tiab] OR older ag*[tiab] OR old age[tiab] OR older adult*[tiab] OR older residents[tiab] OR geriatr*[tiab])

Embase (embase.com)

('health care personnel'/exp OR (personnel OR staff OR 'healthcare worker*' OR 'health care worker*' OR 'health worker*'):ab,ti)

AND

('influenza'/exp OR 'influenza vaccine'/exp OR 'influenza vaccination'/exp OR (influenza* OR flu):ab,ti)

AND

('influenza vaccination'/exp OR 'influenza vaccine'/exp OR (vaccin* OR immunization* OR immunisation*):ab,ti)

AND

('aged'/exp OR 'senior center'/exp OR 'home for the aged'/exp OR (elderly OR senior* OR 'older patient*' OR 'older people' OR 'older ag*' OR 'old age' OR 'older adult*' OR 'older residents' OR geriatr*):ab,ti)

1316 hits 24-01-2017

CINAHL (EBSCOhost)

(MH "Health Personnel+" OR TI personnel OR AB personnel OR TI staff OR AB staff OR TI "healthcare worker*" OR AB "healthcare worker*" OR TI "health care worker*" OR AB "health care worker*" OR TI "health worker*" OR AB "health worker*")

AND

(MH "Influenza, Human+" OR MH "Influenza Vaccine" OR TI influenza* OR AB influenza* OR TI flu OR AB flu)

AND

(MH "Immunization+" OR MH "Immunization Programs" OR MH "Vaccines+" OR MH "Influenza Vaccine" OR TI vaccin* OR AB vaccin* OR TI immunization* OR AB immunization* OR TI immunisation* OR AB immunisation*)

AND

(MH "Aged+" OR MH "Aged, Hospitalized" OR TI elderly OR AB elderly OR TI senior* OR AB senior* OR TI "older patient*" OR AB "older patient*" OR TI "older people" OR AB "older people" OR TI "older ag*" OR AB "older ag*" OR TI "old age" OR AB "old age" OR TI "older adult*" OR AB "older adult*" OR TI "older residents" OR AB "older residents" OR TI geriatr* OR AB geriatr*)

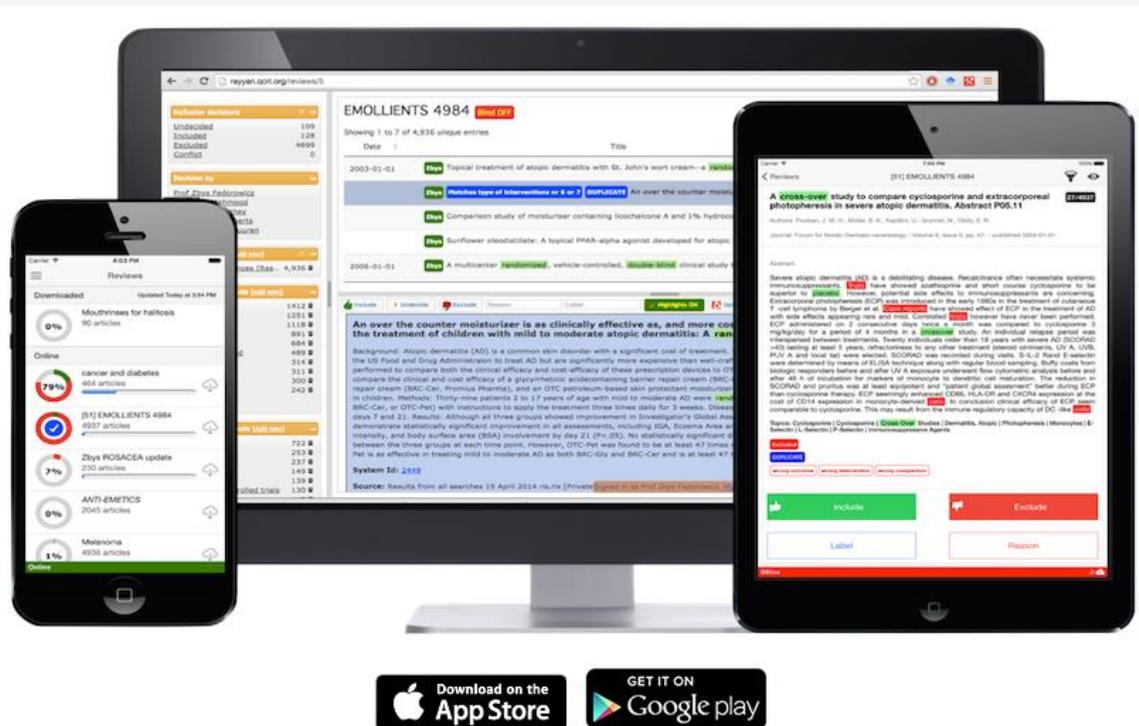
Document, report and deduplicate

- Make a log about the search strategy
- Save search strategies in Word. Record the date and the search result (required for flow chart)
- Use clear filename (e.g. use database name and date)
- Export all references to a reference manager such as **EndNote**
- Find and remove duplicates via **EndNote** (Bramer*)
- Make a backup of your EndNote library

*Bramer WM, Giustini D, de Jonge GB, Holland L, Bekhuis T. De-duplication of database search results for systematic reviews in EndNote [published correction appears in J Med Libr Assoc. 2017 Jan;105(1):111]. J Med Libr Assoc. 2016;104(3):240–243. doi:10.3163/1536-5050.104.3.014

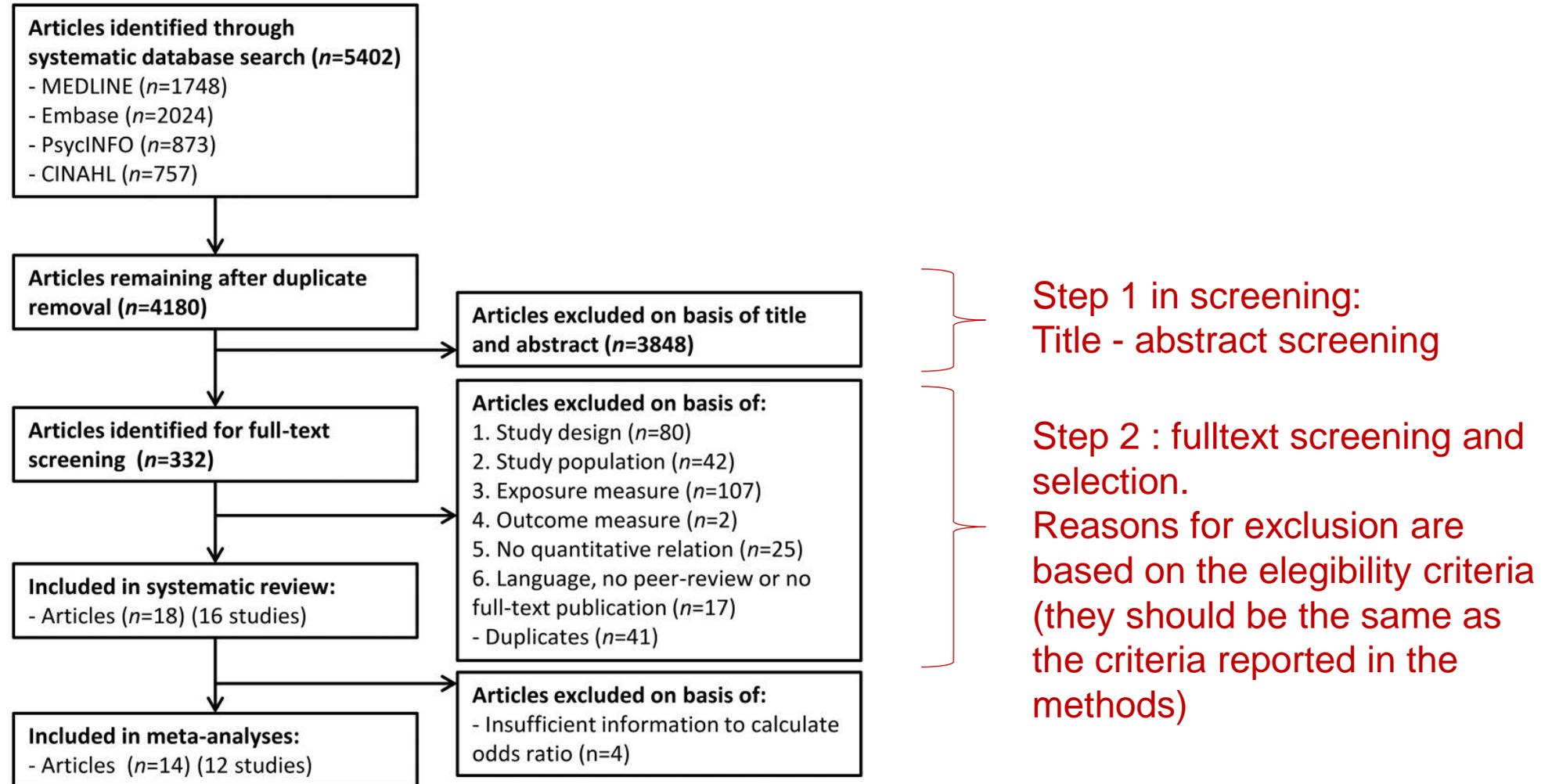
Screening and selection (2 steps, 2 persons per step)

- Export deduplicated references from EndNote to screening software such as **Rayyan**



Example of a flow chart in a published systematic review

Accumulation of adverse childhood events and overweight in children: A systematic review and meta-analysis



Information and help

- [PRISMA statement](http://www.prisma-statement.org) - Transparant Reporting of Systematic Reviews and Meta-Analyses (http://www.prisma-statement.org)
- [Systematic review guide VU](https://libguides.vu.nl/SystematicReviews) (https://libguides.vu.nl/SystematicReviews)
- [Cochrane Handbook](https://training.cochrane.org/handbook) (https://training.cochrane.org/handbook)
- [Cochrane Systematic review e-learning](http://proxy-ub.rug.nl/login?url=https://training.cochrane.org/)
http://proxy-ub.rug.nl/login?url=https://training.cochrane.org/
- [CMB Systematic review libguide](https://libguides.rug.nl/CAT_guide/critical_appraisal) overview of relevant links
https://libguides.rug.nl/CAT_guide/critical_appraisal
- [CMB Make an appointment \(search strategy\)](https://libcal.umcg.nl/appointments?lid=35&g=1132)
https://libcal.umcg.nl/appointments?lid=35&g=1132



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Building the future of health



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