

PEROSH - OSH Evidence

Clearinghouse of Systematic Reviews

METHODS

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[OSH Evidence – Clearinghouse of Systematic Reviews](#)

Table of contents

ABBREVIATIONS	3
1 OSH EVIDENCE – INCLUSION CRITERIA FOR OSH SYSTEMATIC REVIEWS	4
1.1 Introduction.....	4
1.2 Inclusion criteria.....	5
1.3 Criteria for searching and selecting systematic reviews	7
2 DEVELOPING SEARCH STRATEGIES IN MEDLINE AND EMBASE.....	9
2.1 MEDLINE.....	9
2.2 EMBASE.....	11
3 QUALITY ASSESSMENT	12
4 SINGLE REVIEWS	12
APPENDIX.....	13
APPENDIX 1: R-AMSTAR checklist - quality assessment for Systematic Reviews.....	14
APPENDIX 2: The OSH Evidence Search Documentation Form	17
APPENDIX 3: How to fill in an OSH Evidence Search Documentation Form.....	21
APPENDIX 4: The OSH Evidence documentation form for single reviews	25
APPENDIX 5: Additional OSH databases for searching reviews (sorted by relevance).....	26

ABBREVIATIONS

BAuA	Federal Institute for Occupational Safety and Health
CLOP-PIB	Central Institute for Labour Protection - National Research Institute
CRD	Centre for Reviews and Dissemination
DARE	Database of Abstracts of Reviews of Effects
FIOH	Finnish Institute of Occupational Health
IFA	Institute for Occupational Safety and Health of the German Social Accident insurance
INSHT	Instituto Nacional de Seguridad e Higiene en el Trabajo
ISPESL	National Institute for Occupational Safety and Prevention
NRCWE	National Research Centre for the Working Environment
OD	Occupational Disease
OSH	Occupational Safety and Health
PEROSH	Partnership for European Research in Occupational Safety and Health
SIGN	Scottish Intercollegiate Guidelines Network
SJWEH	Scandinavian Journal of Work, Environment and Health
STAMI	National Institute of Occupational Health
TNO	Netherlands Organisation for Applied Scientific Research

1 OSH Evidence – Inclusion criteria for OSH Systematic Reviews

1.1 Introduction

Systematic reviews form an important part of the chain of knowledge transfer from primary research to implementation in practice. Without a proper summary of the available research, it is difficult to draw inferences from science to practice. What the exact contents of this knowledge transfer chain are is not clear, but we think that there is a general consensus that systematic reviews contribute positively. It still leaves us with the question which systematic reviews and for what practice. If we want to build a useful database of systematic reviews both aspects have to be well defined.

The following definitions will be used:

- **Systematic review:** A systematic review attempts to collate all empirical evidence that fits pre-specified eligibility criteria to answer a specific research question. It uses explicit, systematic methods that are selected with a view to minimizing bias, thus providing reliable findings from which conclusions can be drawn and decisions made (Liberati et al, 2009)¹. A systematic review usually contains several primary studies.
- **Meta-analysis:** Meta-analysis is the use of statistical techniques to integrate and summarize the results of included studies (Liberati et al, 2009)¹. In the US it is also used as a synonym for a systematic review.
- **Review:** an article type in which researchers review current knowledge on a topic.
- **Primary study:** a research project in which data are collected on workers, their working life and/or their health.
- **Article:** report of a research project such as a primary study or a systematic review.

The process of finding systematic reviews on a certain topic may be facilitated by a structured approach for framing questions that uses four components (adopted from Liberati et al, 2009): the 'PICO' approach. PICO stands for Population, Intervention/Exposure, Comparator/Control and Outcome. The idea is that these four elements define both an important and relevant question from practice and also a good research question (Sackett 2000). This approach will therefore be used to formulate relevant and precise questions for searching systematic reviews and for classifying systematic reviews on the PEROSH OSH Evidence website.

Another useful framework is that of occupational health as everything related to the etiology, prevention and treatment of occupational diseases, disability and injuries. It was presented before in an article in the SJWEH (Scandinavian Journal of Work, Environment and Health) and (slightly adapted) here in Figure 1. The idea is that exposure in combination with worker behavior leads to one of the health outcomes. Prevention and treatment of health outcomes can occur by intervening in any of these three areas: exposure, behavior or disease.

¹ Liberati et al (2009) The PRISMA Statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. PLoS Med 6(7): e1000100. doi:10.1371/journal.pmed.1000100 or <http://www.prisma-statement.org>

Even though this is used for classifying interventions, it can also be used for classifying etiological studies and other studies because their research questions should somewhere fit into this framework.

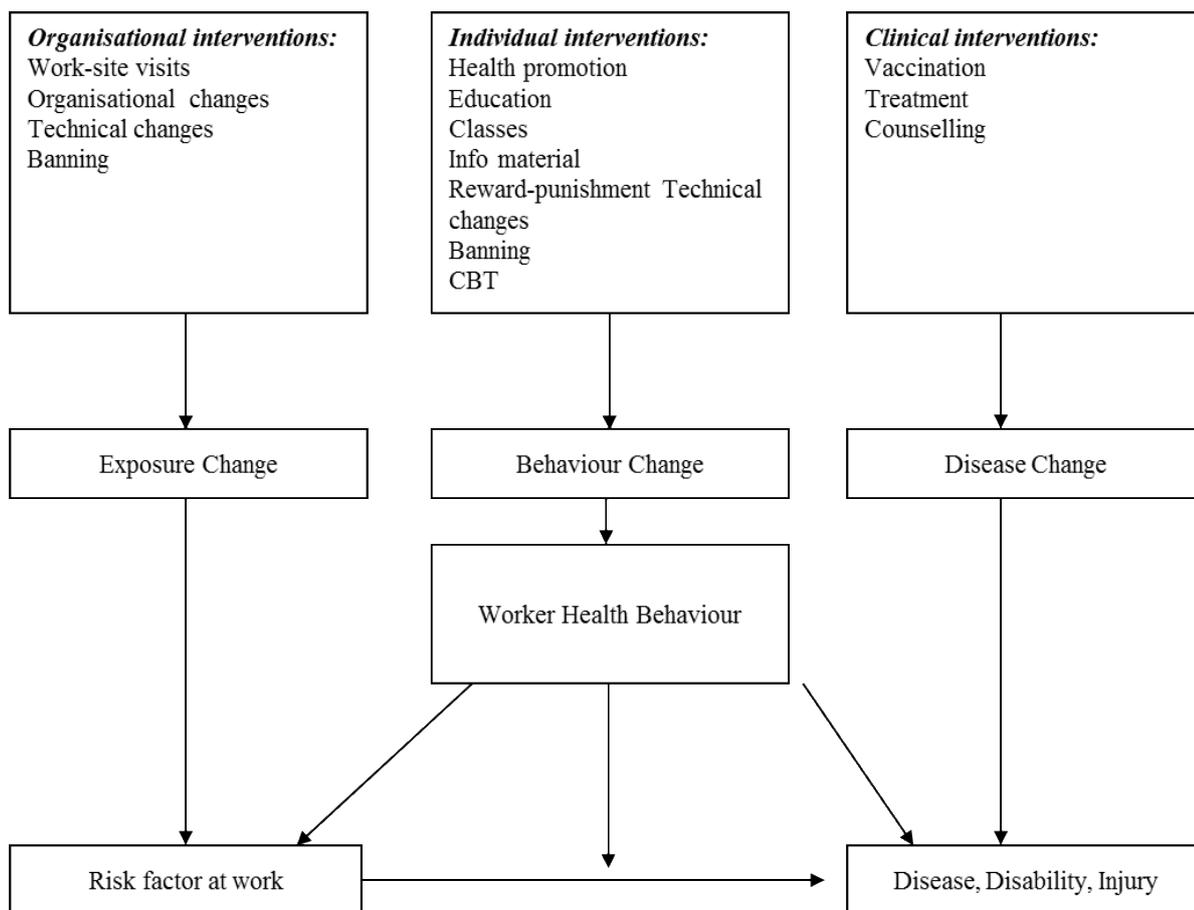


Figure 1: Occupational Health Interventions (adopted from J. Verbeek)²

1.2 Inclusion criteria

1.2.1 Criteria for systematic reviews

We came to the following criteria for systematic reviews to qualify as a systematic review. A systematic review has to fulfill at least the following two criteria to be included in the clearing house database:

1. It should have a clearly stated question on an OSH topic which has led to clearly defined criteria that studies have to meet to be included in the review. The following are a non-exhaustive list of examples of questions: Does intervention X prevent outcome occupational disease (OD) compared to intervention Z? Does intervention X lead to a smaller risk of outcome OD than intervention Z? Does factor A lead to an increased risk of outcome. Does a patient with factor A have a smaller risk of outcome than patients without factor A? What is the prevalence/incidence of outcome?

We propose the following categorization of questions:

- a. *intervention and prevention questions*: questions that are on interventions in workers with medical problems or questions on interventions in workers without

² J. Verbeek et al. Building an evidence base for Occupational Health Interventions. Scand J Work Environ Health. 2004 Apr;30(2):164-70

- medical problems intended to prevent these medical problems (excluding general medical help)
- b. *prevalence-incidence questions*: on the prevalence or incidence of outcomes or risk factors
 - c. *prognosis questions*: on the course of the disease
 - d. *diagnosis questions*: on the features of medical tests
 - e. *etiology questions*: on the causes of disease
2. It should include an electronic search of at least one relevant database (e.g. MEDLINE or EMBASE).

A systematic review can thus contain a meta-analysis or present the results in a narrative way. This is no reason for inclusion or exclusion.

1.2.2 Criteria for Occupational Health and Safety

We came to the following criteria for systematic reviews to qualify as an occupational health systematic review. In order to be taken into the OSH Evidence database a review has to consider occupational health topics. This means that it has to fulfill the criteria of having measured a specific occupational exposure or outcome. When we take the framework above as the point of departure a systematic review has to include studies that have measured one of the three outcomes: exposure, work-related behavior or work-related outcomes.

We will not include public health outcomes measured at the work place or with workers, such as obesity or diabetes. It is agreed that we try to concentrate on classic occupation safety and health (OSH) topics and do not include medical treatment in general nor health promotion directed at general health. However, this is negotiable in the future.

It is straight forward to include reviews based on the three outcomes underneath for intervention/prevention, for prevalence/incidence, prognosis and diagnosis. For etiology it is less clear. Here we propose to include all reviews on the relation of any occupational exposure to any disease or symptom, also if the outcome is that there is no relation between the diseases and the exposure. However, the exposure has to be at work.

1.2.2.1 Occupational Exposure

All possible exposures at work are included varying from chemical substances to stress at work to biomechanical loading. It can be difficult to delineate exposure from symptoms or from internal loading. We prefer to keep the exposure category for external exposure. Symptoms will be classified in a different category.

1.2.2.2 Worker Behavior

Behavior is the way people behave or act in life and what can be observed. Behavior can be an increased movement or the coping behavior to use of personal protective equipment or sticking to a particular work-rest schedule.

It is often difficult to differentiate between behavior and exposure. For example the wearing of hearing protection could be both classified as an intervention to decrease exposure or an intervention to improve hygienic behavior. It depends on the intentions of the authors, what they want to influence. If the intervention is only a technical measure then we are dealing with a decrease of exposure, if it is set up as influencing behavior then it classifies as such. The actual working behavior should be measured. Only a change in knowledge or attitude or satisfaction would not qualify because it is unclear if this also leads to better behavior. Behavior pertaining to public health matters at the work place, i.e. not directly relating to work tasks, will not be included.

When we talk about worker behavior as an outcome of interest we do not imply that workers are deemed responsible for their occupational disease or injury, but only that behavioral factors have a causal role in the development of the disease or injury.

1.2.2.3 Occupational Health or Injuries Outcomes

- ***Work-related and Occupational diseases or symptoms***

This should be taken in a broad sense including work-related diseases and disease symptoms and signs. Also physiological parameters that are or could be an indication of disease are measured here. For example an increase in antibodies would be taken as an occupational disease effect. Occupational is as defined by the authors.

- ***Disability and productivity loss***

All studies that have measured disability as an outcome qualify. Examples of outcomes that would qualify are: workability, sickness absence figures, the time it takes to return to work after a workplace intervention for back pain, or workers compensation during sickness absence. Productivity loss at work may also be included.

- ***Injuries***

All outcomes that measure occupational accidents or injuries qualify. Injuries are not understood as in the North American workers' compensation sense, but in the sense of trauma.

1.3 Criteria for searching and selecting systematic reviews

- Research questions for the systematic reviews should be formulated in terms of PICO: Population, Intervention/Exposure, Control, and Outcome.
- It is advised to use the OSH Evidence guidelines on search strategies and search terms for finding systematic reviews and occupational topics (see also Chapter 2: 'Developing search strategies in MEDLINE and EMBASE for PEROSH OSH Evidence systematic reviews in the field of occupational health').

1.3.1 Literature search

- Searches for systematic reviews should be done in at least one relevant electronic database such as PubMed and EMBASE, dependent on the topic. A list of OSH databases is provided in Appendix 5.
- Reviews should start from the year 2000 onwards (older reviews are mostly outdated), unless the type of exposure would warrant older reviews.
- Language should not be a restriction for inclusion in the OSH Evidence database. However, we will restrict ourselves to reviews that are written in one of the European languages. Partners promise to assist each other in translating basic facts of reviews in any of these languages into English.

1.3.2 Selection process

1.3.2.1 Inclusion criteria:

A. According to **PICO**- question

B. According to inclusion criteria for systematic reviews

C. According to inclusion criteria for Occupational Health and Safety topics

1.3.2.2 Study selection:

First step: Based on titles and abstract, two reviewers select the retrieved articles independently resolving discrepancies by discussions (consider blinding reviewers regarding to authors' and journals' names, publication years etc.).

Second step: Based on the pre-selected full texts, two reviewers apply the above mentioned inclusion criteria independently resolving discrepancies by discussions or by consensus conference. Documentation of the selection process should allow reviewers to fill in the PRISMA diagram.

2 Developing search strategies in MEDLINE and EMBASE

We have divided the search strategy into two parts:

1. Terms for the disease combined with terms for the occupation or exposure
2. Terms for the type of study, in our case systematic reviews.

For each we have selected the best strategy to find search terms and these should be combined with the AND-operator. Because the databases all work slightly differently you have to use different search words for each database. For finding disease and occupation related terms we follow the search strategy proposed by Frederieke Schaafsma³. For the type of studies we have selected the best search strategies published in the literature. In the following sections you will find the search strategies for MEDLINE and EMBASE.

2.1 MEDLINE

2.1.1 Terms for the disease and terms for the occupation or exposure in MEDLINE

To search for studies on the occupational origin of diseases in MEDLINE we propose to apply the approach as Schaafsma et al. (2006) (see the adapted flowchart):

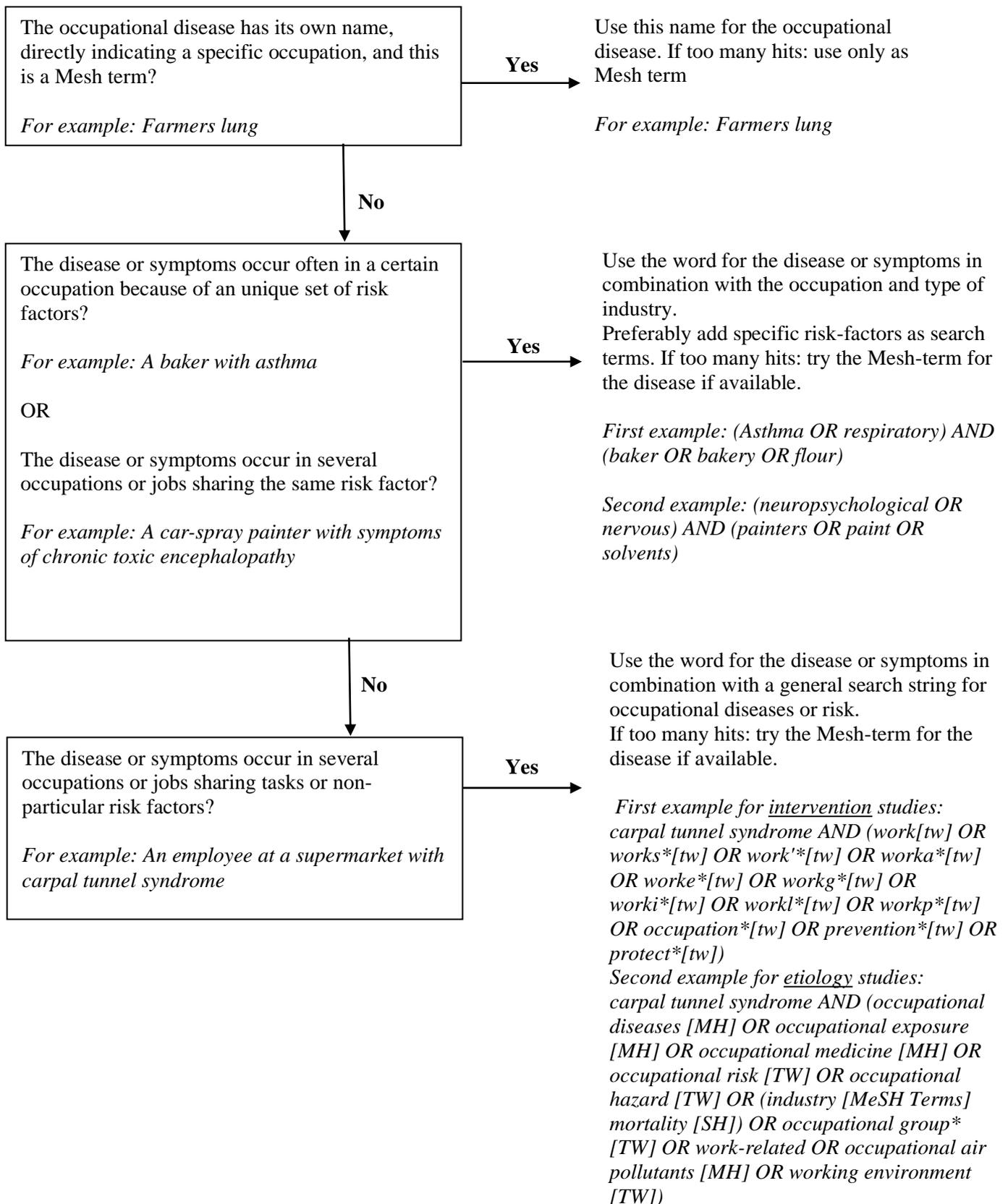
Schaafsma et al. (2006) “propose to start with the proper name for the occupational disease. If this does not exist, we advise to use a specific term for the occupation and company in combination with terms for disease or symptoms. To improve the sensitivity of the search one should also use the keyword for the specific risk factor. If there is no relevant occupational title available, we advise to try general keywords like ***(work[tw] OR works*[tw] OR work*[tw] OR worka*[tw] OR worke*[tw] OR workg*[tw] OR worki*[tw] OR workl*[tw] OR workp*[tw] OR occupation*[tw] OR prevention*[tw] OR protect*[tw])*** as studied and advocated by the Cochrane Occupational Safety and Health Review Group for intervention studies⁴. To be even more specific for etiological studies you could use the search string proposed by Stefano Mattioli⁵: ***(occupational diseases [MH] OR occupational exposure [MH] OR occupational medicine [MH] OR occupational risk [TW] OR occupational hazard [TW] OR (industry [MeSH Terms] mortality [SH]) OR occupational group* [TW] OR work-related OR occupational air pollutants [MH] OR working environment [TW])*** (Mattioli et al. 2010). We strongly recommend to use one of the published search strategies or at least to make good use of their experiences.

³ Schaafsma F. et al. Developing search strategies in medline on the occupational origin of diseases. Am J. Ind. Med. 2006;49:127-137.

⁴ Verbeek J et al. A search strategy for occupational health intervention studies. Occup Environment Med 2005;62: 682-687.

⁵ Mattioli et al. Search strings for study of putative occupational determinants of disease. Occup Environ Med 2010 Jul;67(7):436-43.

2.1.2 Flowchart of search strategies for occupational origins of diseases in MEDLINE (PubMed) adapted from Schaafsma et al. (2006)



2.1.3 Terms for systematic reviews in MEDLINE

We adapted the "MEDLINE via Ovid" strategy used by the Centre for Reviews and Dissemination (CRD, York⁶) to identify systematic reviews for inclusion on Database of Abstracts of Reviews of Effects (DARE), and developed a search string in PubMed.

Search Strategy **MEDLINE** via **Ovid**:

1. review.ab.
2. review.pt.
3. meta-analysis as topic/
4. meta-analysis.ab.
5. meta-analysis.pt.
6. meta-analysis.ti.
7. or/1-6
8. letter.pt.
9. editorial.pt.
10. comment.pt.
11. or/8-10
12. 7 not 11
13. animals/ not (animals/ and humans/)
14. 12 not 13

Search Strategy **MEDLINE** via **PubMed**:

A single-line version of this search, which can be copied into a text file and pasted into PubMed:

```
"meta-analysis as topic"[MeSH Terms] OR meta-analysis[pt] OR meta-analysis[tiab] OR review[pt] OR review[tiab] NOT (letter[pt] OR editorial[pt] OR comment[pt]) NOT ("animals"[MeSH Terms:noexp] NOT "humans"[MeSH Terms])
```

2.2 EMBASE

2.2.1 Terms for the disease and terms for the occupation or exposure in EMBASE

For a specific search: ***FC T=(occupation?;work?) OR EC=035***

For a more sensitive search, we will use additionally the OR-combination ***EC=017***

2.2.2 Terms for systematic reviews in EMBASE

Search reviews: we will take over the strategy of Wilszynski 2007⁷: ***meta-analysis:ct OR search OR review:dt.***

⁶ Centre for Reviews and Dissemination. Available at: http://www.york.ac.uk/inst/crd/index_guidance.htm. Accessed on: March 2014.

⁷ Wilczynski NL, Haynes RB; Hedges Team. EMBASE search strategies achieved high sensitivity and specificity for retrieving methodologically sound systematic reviews. *J Clin Epidemiol.* 2007 Jan;60(1):29-33.

3 Quality assessment

Every systematic review should be assessed on its quality by using the 'R-AMSTAR' checklist⁸, revised assessment of multiple systematic reviews. The checklist contains 11 items with quality scores ranging from 1 to 4. Outcome of the quality assessment will be the sum of the quality scores, which will range from 11 to 44. For PEROSH OSH Evidence Reviews we based the criteria for the quality coding system on Kung et al. (2010)⁹. The instruction of how to use the R-AMSTAR checklist is available in Appendix 1.

In the search documentation form the sum of quality scores will be included together with comments on the review referring to the items of the checklist. Below you will find an example of a quality assessment. The complete search documentation is included in APPENDIX 3.

No.	1 st author / Publication year	Overall study assessment (sum of quality scores)	Internal validity
1.	Van den Berg, 2010	21	Comments: Research question may be described more clearly. Not mentioned if there was more than one person for data extraction. Search not supplemented by hands searching, references etc. No statement of a search for studies other than papers in the databases, restricted to English papers. No quality assessment of included studies.

4 Single reviews

Initially, the OSH Evidence Database was only meant for the results of searches for systematic reviews addressing an OSH research question. Although we still prefer a search and overview of reviews, the alternative option to include single reviews has been added to the OSH Evidence database. No search is needed for a single review, but for the rest the same criteria are valid:

- Research question should be defined in PICO terms: Population, Intervention or exposure, Control or comparison group and Outcome.
- The review should meet the inclusion criteria as described in the first chapter if this paper.
- A quality assessment by means of the AMSTAR checklist should be performed and documented.

The documentation form and quality assessment will be checked. A discussion might follow, and if needed an adjustment. A copy of the documentation form meant for single reviews can be found in appendix 4.

⁸ At the start of the OSH Evidence working group, another quality assessment method was used: the SIGN list. After some time we decided to use the R-AMSTAR checklist instead, but older searches in the database still contain a quality assessment according to the SIGN checklist.

⁹ Kung J, Chiappelli F, Cajulis OO, Avezova R, Kossan G, Chew L, Maida CA. From Systematic Reviews to Clinical Recommendations for Evidence-Based Health Care: Validation of Revised Assessment of Multiple Systematic Review (R-AMSTAR) for Grading of Clinical Relevance. Open Dent J. 2010 Jul 16;4:84-91.

APPENDIX

APPENDIX 1: R-AMSTAR checklist - quality assessment for Systematic Reviews

How to use the R-AMSTAR tool?

The tool contains 11 questions with regard to the quality of the review. These questions are in the left column. Based on the criteria mentioned in the right column, every question should be assigned a score from 1 to 4. The sum of all scores is the overall quality score of the systematic review.

AMSTAR items	Criteria
<p>1. Was an “a priori” design provided? The research question and inclusion criteria should be established before the conduct of the review.</p>	<p>A A clearly focused (PICO-based) question B Description of inclusion criteria C Study protocol is published and/or registered in advance 3 criteria→4, 2→3, 1→2, 0→1</p>
<p>Explanation: A. It should be explicitly mentioned that a protocol was published or registered, for example in PROSPERO an online international prospective register of systematic reviews. C. The question contains Population, Intervention/exposure, Comparator/control and Outcome.</p>	
<p>2. Was there duplicate study selection and data extraction? There should be at least two persons who independently extracted data and a consensus procedure for disagreements should be in place.</p>	<p>A At least two persons independently extracted the data, explicitly stated B Statement of consensus procedure for disagreements C Disagreements among extractors resolved properly as stated or implied 3 criteria→4, 2→3, 1→2, 0→1</p>
<p>3. Was a comprehensive literature search performed? At least two electronic sources should be searched. The report must include years and databases used (e.g., Central, EMBASE, and MEDLINE). Key words and/or MESH terms must be stated, and where feasible, the search strategy should be provided. All searches should be supplemented by consulting current contents, reviews, textbooks, specialized registers, or experts in the particular field of study, and by reviewing the references in the studies found.</p>	<p>A At least two electronic sources are searched B Years and databases used are mentioned C Key words and/or MESH terms are stated and where feasible the search strategy outline is provided D Searches should be supplemented by consulting current contents, reviews, textbooks, registers and by reviewing the references in the studies found E Journals are hand-searched or manual searched 4 or 5 criteria→4, 3→3, 2→2, 1 or 0→1</p>
<p>Explanation: E. hand-searched means identifying highly relevant journals and conducting a manual, page-by-page search of their contents looking for potentially eligible studies.</p>	
<p>4. Was the status of publication (i.e., grey literature) used as an inclusion criterion? The authors should state that they searched for reports regardless of their publication type. The authors should state whether or not they excluded any reports (from the systematic review), based on their publication status, language etc.</p>	<p>A The authors state that they searched for reports regardless of their publication type. B The authors state whether or not they excluded any reports based on their publication status, language etc. C “Non-English papers were translated” or readers sufficiently trained in foreign language D No language restriction or recognition of non-English articles 3 or 4 criteria→4, 2→3, 1→2, 0→1</p>

AMSTAR items	Criteria
<p>5. Was a list of studies (included and excluded) provided? A list of included and excluded studies should be provided.</p>	<p>A Table/list/figure of included studies, a reference list does not suffice</p> <p>B Table/list/figure of excluded studies either in the article or in a supplemental source</p> <p>C Satisfactory/sufficient statement of the reason for exclusion of the seriously considered studies</p> <p>D Reader is able to retrace the included and the excluded studies anywhere in the article bibliography, reference or supplemental source</p> <p>4 criteria→4, 3→3, 2→2, 1→1</p>
<p>Explanation: “Excluded studies” refers to those studies seriously considered on the basis of title and/or abstract, but rejected after reading the body of the text.</p>	
<p>6. Were the characteristics of the included studies provided? In an aggregated form, such as a table, data from the original studies should be provided on the participants, interventions/exposure, and outcomes. The ranges of characteristics in all the studies analyzed, e.g., age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases should be reported.</p>	<p>A In an aggregated form such as a table, data from the original studies are provided on the participants, interventions/exposure and outcomes</p> <p>B Ranges are provided of the relevant characteristics in the studies analyzed</p> <p>C The information provided appears to be complete and accurate</p> <p>3 criteria→4, 2→3, 1→2, 0→1</p>
<p>7. Was the scientific quality of the included studies assessed and documented? “A priori” methods of assessment should be provided (e.g., for effectiveness studies if the author(s) chose to include only randomized, double-blind, placebo-controlled studies, or allocation concealment as inclusion criteria); for other types of studies, alternative items will be relevant.</p>	<p>A ‘A priori’ methods are provided</p> <p>B The scientific quality of the included studies appears to be meaningful</p> <p>C Discussion/recognition/awareness of level of evidence is present</p> <p>D Quality of evidence is rated/ranked base on characterized instruments</p> <p>4 criteria→4, 3→3, 2→2, 1 or 0→1</p>
<p>Explanation: D. A characterized instrument is a created instrument that ranks the level of evidence, e.g. GRADE [Grading of Recommendations Assessment, Development and Evaluation].</p>	
<p>8. Was the scientific quality of the included studies used appropriately in formulating conclusions? The results of the methodological rigor and scientific quality should be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.</p>	<p>A The scientific quality is considered in the analysis and the conclusions of the review</p> <p>B The scientific quality is explicitly stated in formulating recommendations</p> <p>C Conclusions integrated/drives towards practice guidelines</p> <p>D Clinical consensus statement drives toward revision or confirmation of practice guidelines</p> <p>4 criteria→4, 3→3, 2→2, 1 or 0→1</p>
<p>9. Were the methods used to combine the findings of studies appropriate? For the pooled results, a test should be done to ensure the studies were combinable, to assess their homogeneity (i.e., Chi-squared test for homogeneity, I²). If heterogeneity exists, a random effects model should be used and/or the clinical appropriateness of combining should be taken into consideration (i.e., is it sensible to combine?).</p>	<p>A Statement of criteria that were used to decide that the studies analyzed were similar enough to be pooled</p> <p>B For the pooled results, a test is done to ensure the studies were combinable, to assess their homogeneity</p> <p>C a recognition of heterogeneity or lack of thereof is present</p> <p>D If heterogeneity exists a ‘random effects model’ is used and/or the rationale of combining is taken into consideration</p>

<i>AMSTAR items</i>	<i>Criteria</i>
	E If homogeneity exists, author state a rationale or a statistical test 4 or 5 criteria → 4, 3 → 3, 2 → 2, 1 or 0 → 1
<p>10. Was the likelihood of publication bias assessed? An assessment of publication bias should include a combination of graphical aids (e.g., funnel plot, other available tests) and/or statistical tests (e.g., Egger regression test).</p>	<p>A Recognition of publication bias or file-drawer effect B Graphical aids (e.g. funnel plot) C Statistical tests (e.g. Egger regression test)</p> <p>3 criteria → 4, 2 → 3, 1 → 2, 0 → 1</p>
<p>11. Was the conflict of interest included? Potential sources of support should be clearly acknowledged in both the systematic review and the included studies.</p>	<p>A Statement of sources of support B No conflict of interest. This is subjective and may require some deduction or searching. C An awareness/statement of support or conflict of interest in the primary inclusion studies</p> <p>3 criteria → 4, 2 → 3, 1 → 2, 0 → 1</p>

APPENDIX 2: The OSH Evidence Search Documentation Form



OSH Evidence

Clearinghouse of systematic reviews

Search Documentation Form

Collected systematic reviews for the topic “...”

	Reference	Study Grading (sum of R-AMSTAR scores)	PubMed link
1.			
2.			
3.			
...			

Name:
Institute/Organisation:
Address and email:

1. Objective:

(free text)

Collecting systematic reviews on the topic: ...

2. Question:

(free text & structured question according to **PICO** = **P**opulation, **I**ntervention (exposures), **C**omparison (control) and **O**utcome)

Population:

Intervention/Exposure:

Comparison:

Outcome:

3. Searched Databases:

Database	Time span	Date searched (dd-mm-yyyy)	Citations in Database	Duplications
Medline (PubMed)				
Other sources (if yes, please list them)				
Total				

4. Search Strategy:

MEDLINE via PubMed, searched ... (date/by .. (initials))

#	Searches	Results
1		
2		
3		
-		

Search string:

Other (name), searched ... (date/by .. (initials))

#	Searches	Results
1		
2		
3		
-		

Search string:

5. Selection process:

Inclusion criteria:

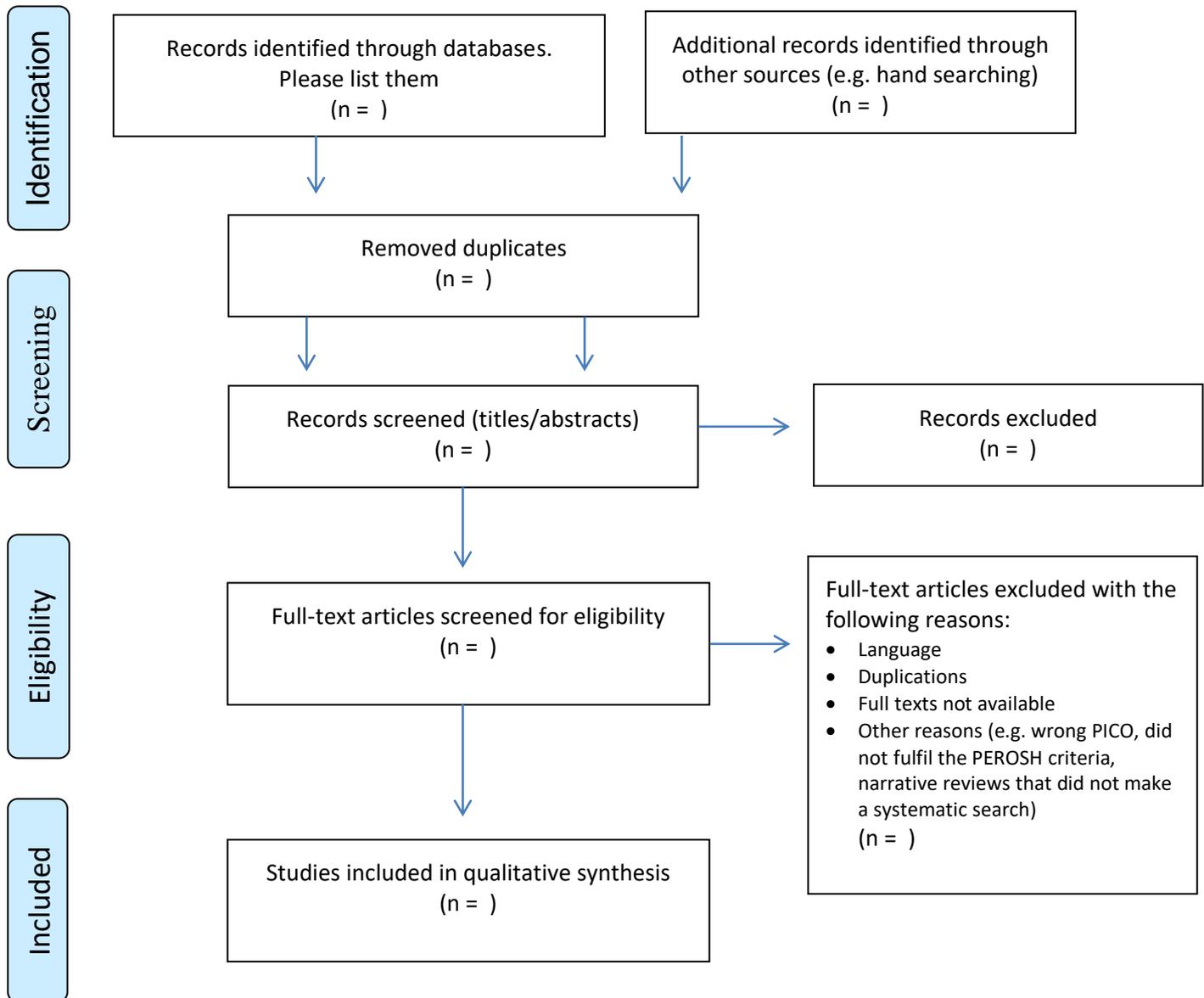
- According to PICO- question (see 2.)
- According to inclusion criteria for systematic reviews (see PEROSH OSH Evidence Inclusion and classification criteria for Occupational Health Reviews)
- According to inclusion criteria for Occupational Health and Safety topics (see PEROSH OSH Evidence Inclusion and classification Criteria for Occupational Health Reviews)

Selection:

First step: Based on titles and abstract, two reviewers select the retrieved articles independently resolving discrepancies by discussions.

Second step: Based on the pre-selected full texts, two reviewers apply the above mentioned inclusion criteria independently resolving discrepancies by discussions or by consensus conference.

6. Results: (Adapted from PRISMA 2009 Flow Diagram)



7. Grading of the Systematic Reviews:
(Based on the R-AMSTAR Checklist)

Quality validation of the studies included, two reviewers apply the AMSTAR-R criteria independently resolving discrepancies by discussions or by consensus conference.

No	1 st author / Publication year	Overall study assessment (sum of quality scores)	Internal validity
1.			Comments:
2.			Comments:
3.			Comments:
4.			Comments:
...			Comments:

Consent for use of personal data

I hereby authorize the PEROSH OSH Evidence Group to publish my personal data, as specified in this Search Documentation Form, on the PEROSH website including its database of Systematic Reviews of Occupational Safety and Health.

I am aware that my authorized personal data can be consulted by anyone having access to the website using the Internet or any other dedicated network.

APPENDIX 3: How to fill in an OSH Evidence Search Documentation Form

- (example) -

Collected systematic reviews for the topic “Physically demanding work and early retirement”

No.	Reference	Study Grading (sum of R-AMSTAR scores)	PubMed link
1.	van den Berg TI, Elders LA, Burdorf A. Influence of health and work on early retirement. J Occup Environ Med. 2010 Jun;52(6):576-83.	21	PMID: 20523241

PEROSH OSH Evidence Search Documentation Form

Name: Swenneke van den Heuvel, Bengt Järholm, Jolanda ter Laak, Leena Isotalo
Institute/Organisation: TNO, Umeå University, FIOH
E-mail: swenneke.vandenheuvel@tno.nl ; bengt.jarvholm@envmed.umu.se

1. Objective:

Collecting systematic reviews on the topic: Physically demanding work and early retirement

2. Question:

Is physically demanding work a risk factor for early retirement?

Population: workers between 55 and 65 years of age

Intervention/Exposure: physically demanding work

Comparison: no physically demanding work

Outcome: early retirement

3. Searched Databases:

Database	Time span	Date searched (dd-mm-yyyy)	Citations in Database	Citations after duplicate check
MEDLINE (PubMed)	2000-2013	17.10.2013	18	18
EMBASE	2000-2013	22.10.2013	96	91
Other sources (if yes, please list them)				
Total (including MEDLINE, EMBASE and others)			109	

4. Search Strategy:

MEDLINE via PubMed, searched 17.10.2013/JtL

#	Searches	Results
1	working environment [TW] OR Occupations OR [Mesh] OR Workplace[Mesh] OR occupation [MH] OR work (MeSH) OR employment [MeSH] OR occupational diseases [MeSH] OR work [TW]	693,556
2	Workload [MeSH] OR physical endurance [MeSH] OR workload [TW] OR physical [TW] OR risk factors [MeSH]	604,679
3	#1 AND #2	53,754
4	Aged [MeSH] OR aging [MeSH] OR middle aged [MeSH] OR aging [TW] or aged [TW]	3,996,177
5	#3 AND #4	17,176
6	Retirement [MeSH] OR retirement [TW] OR pensions [MeSH] or pension [TW]	15,610
7	#5 AND #6	452
8	meta-analysis as topic [MeSH] OR meta-analysis [Pt] OR meta-analysis [TiAb] OR review [Pt] OR review [TiAb]) NOT letter [Pt] OR editorial [Pt] OR comment [Pt] NOT animals [Mesh]	2,122,273
9	#7 AND #8 AND >1999 [Date-Publication]	18

EMBASE, searched 22.10.2013/LI

#	Searches	Results
1	'employment'/exp OR 'workplace'/exp OR 'occupational hazard'/exp OR 'occupational disease'/exp OR 'work environment'/exp OR 'working environment' OR occupation* OR workplace* OR work OR employee* OR worker* OR employment:ab,ti	2,323,411
2	'workload'/exp OR 'endurance'/exp OR 'physically induced stress'/exp OR workload:ab,ti OR physical:ab,ti OR risk NEXT/1 factor* OR 'heavy work' OR physical* NEXT/1 demand* OR 'physical endurance'	1,260,384
3	'aged'/exp OR 'middle aged'/exp OR aging:ab,ti OR ageing:ab,ti OR elderly:ab,ti OR age:ab,ti OR early:ab,ti OR earlier:ab,ti	5,102,235
4	retirement OR pension* OR retired	25,913
5	review:it OR 'review'/exp OR review:ab,ti OR reviews:ab,ti OR 'meta analysis'/exp OR 'meta analysis (topic)'/exp OR metaanalysis OR 'systematic literature' OR 'systematic search'	2,636,646
6	#1 AND #2 AND #3 AND #4 AND #5	174
7	#6 AND [embase]/lim AND [2000-2014]/py	96

5. Selection process:

5.1 Inclusion criteria:

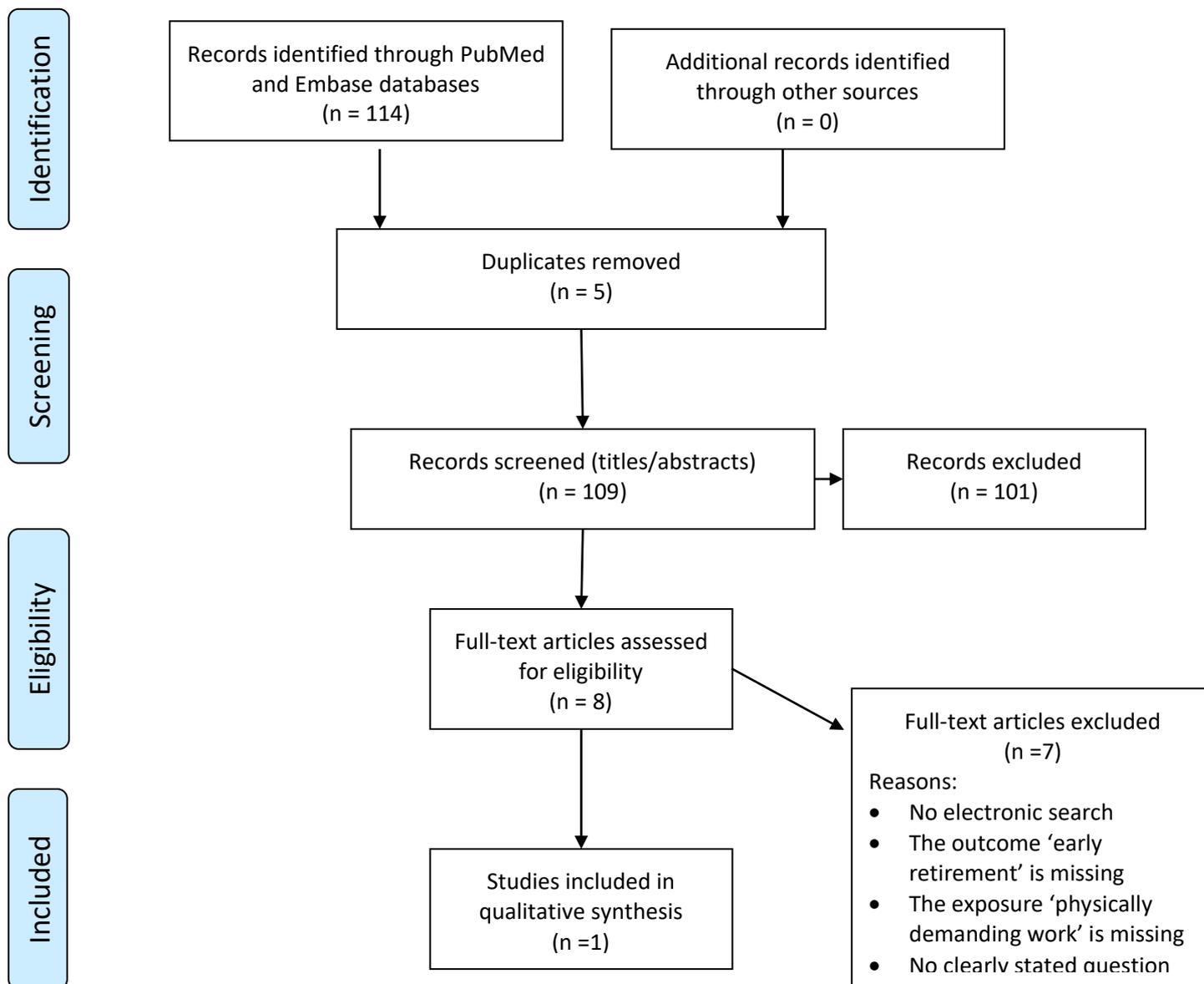
- A.** According to **PICO**- question (see 2.)
- B.** According to inclusion criteria for systematic reviews (see PEROSH OSH Evidence Inclusion and classification criteria for Occupational Health Reviews)
- C.** According to inclusion criteria for Occupational Health and Safety topics (see PEROSH OSH Evidence Inclusion and classification Criteria for Occupational Health Reviews)

5.2 Selection:

First step: Based on titles and abstract, two reviewers select the retrieved articles independently resolving discrepancies by discussions.

Second step: Based on the pre-selected full texts, two reviewers apply the above mentioned inclusion criteria independently resolving discrepancies by discussions or by consensus conference.

6. Results: (Adapted from PRISMA 2009 Flow Diagram)



7. Grading of the Systematic Reviews:

(Based on the R-AMSTAR Checklist)

No.	1 st author / Publication year	Overall study assessment (sum of quality scores)	Internal validity
1.	Van den Berg, 2010	21	Comments: Research question may be described more clearly. Not mentioned if there was more than one person for data extraction. Search not supplemented by hands searching, references etc. No statement of a search for studies other than papers in the databases, restricted to English papers. No quality assessment of included studies.

APPENDIX 4: The OSH Evidence documentation form for single reviews



OSH Evidence

Clearinghouse of systematic reviews

Documentation form for single reviews

Name:

Institute/Organisation:

Address and email:

1. Systematic review:
(reference)

2. Research question: (according to PICO = Population, Intervention (exposures), Comparison (control) and Outcome)

Population:

Intervention/Exposure:

Comparison:

Outcome:

3. Grading of the Systematic Reviews:
(Based on the R-AMSTAR Checklist)

Overall study assessment (sum of quality scores)	Internal validity
	Comments:

Consent for use of personal data

I hereby authorize the PEROSH OSH Evidence Group to publish my personal data, as specified in this Search Documentation Form, on the PEROSH website including its database of Systematic Reviews of Occupational Safety and Health.

I am aware that my authorized personal data can be consulted by anyone having access to the website using the Internet or any other dedicated network.

APPENDIX 5: Additional OSH databases for searching reviews (sorted by relevance)

Database	Producer	URL	Fees	Comments
MEDLINE	National Library of Medicine, U.S.	http://www.ncbi.nlm.nih.gov/pubmed	No	Largest medical literature database worldwide, international journals, medical and related topics, comprehensive thesaurus MESH (Medical Subject Headings), smart retrieval
EMBASE	Elsevier B. V.	https://www.elsevier.com/solutions/embase-biomedical-research	Yes	Medical and health related topics, international journals with European focus, thesaurus EMCLAS
Cochrane WORK	FIOH, Finland	https://work.cochrane.org/	No	Reviews on interventions in prevention and treatment of occupational or work-related diseases, injuries and disorders; part of the Cochrane Library.
NIOSHTIC 2	NIOSH, U.S.	http://www2a.cdc.gov/nioshtic-2/default.asp	No	bibliographic database of occupational safety and health publications, documents, grant reports, and other communication products supported in whole or in part by NIOSH
HSELINE	HSE, U.K.	http://www.hse.gov.uk/infoserv/hseline.htm different providers	Yes	bibliographic database of occupational safety and health publications
Cochrane Library	Cochrane Collaboration	http://www.cochrane.org/	No	Systematic reviews on interventions in medicine and health care, evidence based medicine. Title and abstracts for free, full text is subject to fees
CINAHL	EBSCO Publishing	https://www.ebsco.com/products/research-databases/cinahl-complete	No	nursing and allied health literature, 4 databases
CISDOC	ILO	http://www.ilocis.org/en/cis_srch.html	Yes	international, multilingual database provides references to all aspects of health and safety with an emphasis on training and policy documents from various countries
Systematic reviews in OSH	Institute of Work and Health, Canada	http://www.iwh.on.ca/systematic-reviews	No	Reviews mainly about MSD, Cochrane Back Review Group at the IWH

Database	Producer	URL	Fees	Comments
Psychinfo	American Psychological Association	https://www.apa.org/pubs/databases/psycinfo	Yes	International literature on psychology and related fields
PSYINDEX	ZPID, Germany	https://www.psychindex.de/	Yes	Englisch and German literature on psychology topics
BAUA Literature	BAuA, Germany	https://www.baua.de/DE/Angebote/Bibliothek/Bibliotheks kataloge.html use WebOPAC	No	German and international literature on occupational safety and health
ZIGUV	DGUV, Germany	Just available for social accident insurance partners via intranet	No	German and international literature on occupational safety and health
Other		http://www.sciencedirect.com/ https://scholar.google.com/	No	Online search

For further information see: WHO, Verbeek 2006: A practical guide for the use of research information to improve the quality of occupational health practice
http://www.who.int/occupational_health/publications/pwh7/en/index.html