# Industry PhD Program- Rapid Reviews

Rapid reviews are a focused review of what is known about a topic or problem identified by industry. They bring together knowledge from a range of sources including academia, industry and government reports, to highlight and target future research areas. This is done in a 6 to 8-month time frame and is guided by the Industry Reference Group associated with the topic. At the end of the process, current knowledge is summarised, and recommendations on future research and policy areas are clearly identified to allow the Industry PhD project to continue with a clear issue to focus on that is beneficial to both industry and academia.

## The Rapid Review

A rapid review is an assessment of what is already known about a policy or practice issue, by using systematic review methods to search and critically appraise existing research [1]. The rapid review methodology is a variation of the systematic literature review, considered the 'gold standard' of reviews, however their main drawback is the long time period that they take to complete [2]. With an increasing demand for research to be synthesised for an industry context in a shorter timeframe, rapid reviews have developed to be a viable alternative to full systematic reviews [3].

The rapid review approach can be completed in 6 to 8-months, while systematic reviews may take a year or more to complete [4]. This approach is utilised for subjects that are topical, requiring quick decision making based on scientific evidence and can be used by industry or government [5]. While a systematic literature review aims to review all peer-reviewed journal articles on a topic, including empirical research papers, a rapid review generally includes only review papers, including systematic literature review papers and empirical papers with extensive literature review sections [4]. The revision of reviews enables the inclusion of a wider number of articles captured through the original review process but without the need to analyse them individually. There may also be time limits applied to the papers included in the review and relevant grey literature may be included as well. A systematic literature review may have more than 60 papers to review, while a rapid review has approximately 5-20 articles.

The problem definition in a rapid review is informed by key stakeholder interviews to ensure the topic is relevant. However, the search string criteria, identification of possible biases, database search execution, screening and synthesisation of results is the same for both a systematic and a rapid review processes, ensuring they are robust and reproducible [4]. The rapid review process may have some restrictions on the breath of conclusions when compared to systematic literature reviews, but the findings are more robust than non-systematic reviews [1].

The rapid review methodology has been encouraged by the World Health Organisation and has recently been used to inform policies during the COVID-19 crisis [6–8]. The built environment has also begun using rapid reviews to inform policy in consultation with industry and government stakeholders in reports [9–14] that are beginning to be peer-reviewed and published [15].

The rapid review process produces 3 documents: an industry summary of 2-5 pages outlining the key findings and recommendations; a rapid review report of over 30 pages that details the methodology and findings; and a journal article based on the report, but expanded upon to place the research into the literature. The industry summary and the rapid review report can be shared publically by both the research team and the industry partners, whilst the journal article access is dependent upon the journal it is published in.

**Industry Reference Group and Stakeholders**

The review team members are outlined in Figure 1. The core team consists of the PhD student and their supervisors who will undertake the rapid review. The Industry Reference Group involves 2-5 members from the relevant industry that will drive the research topic and review the documentation produced. This group sets the initial research question, helps focus this question and reviews the industry summary and rapid review report. The input of the group is particularly important to focus the research question and review the documents to ensure the research is relevant and useful for the industry. A number of stakeholders or end users are interviewed to focus the research question, however their responses are not recorded directly in the reports

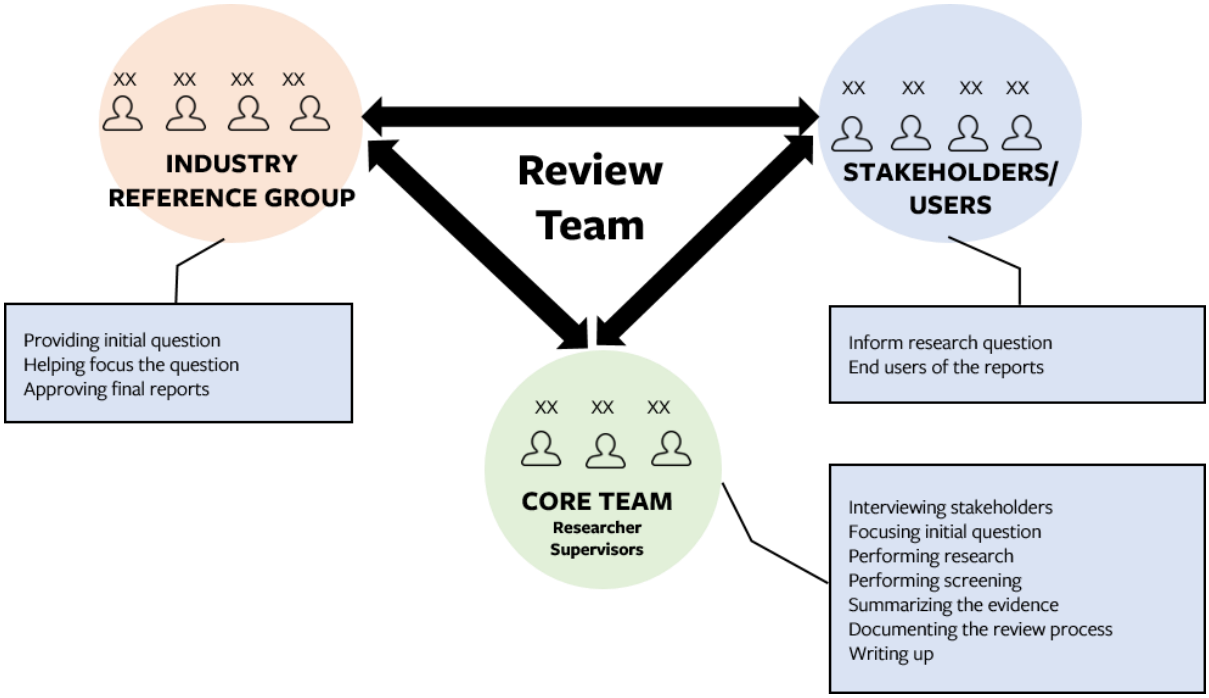
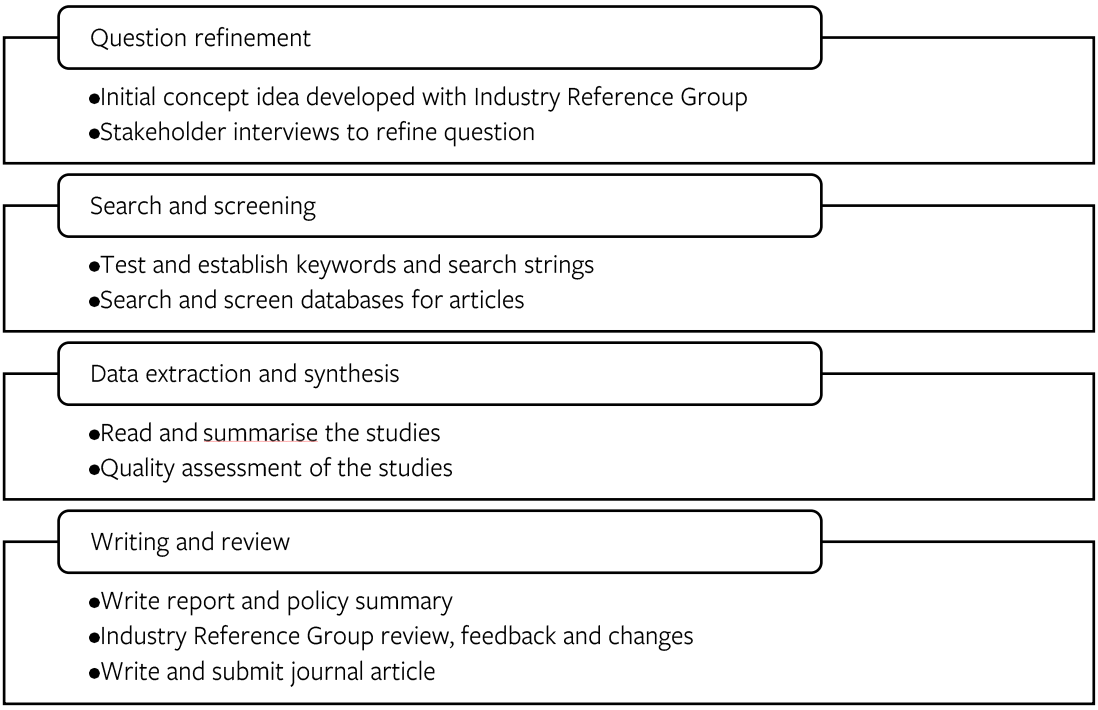



*Figure 1 Review team members (based on [2])*

## The rapid review process

The approach used to conduct the rapid review follows a similar process to undertaking a systematic literature review to ensure a comprehensive review is conducted. The rapid review process is outlined in Table 1.

*Table 1 The Rapid Review Process*




**Question refinement**

The research question that guides the rapid review is set by the research team and industry reference group following consultation with government and industry representatives who work in the related research area. The consultation process is used only to set the research question, it should not be reported on as results of the research, however general comments can be made about the topics raised during the discussions and how this guided the research question. Following industry engagement and an initial scoping of the literature, the research question is refined and set for the rapid review.

**Search and screening**

Based on the research question, a list of keywords and associated terms that relate to the topic can be compiled. These can be found in the keyword section of journal articles as well as common terms used throughout the literature. These keywords can then be used to formulate the search string/s. These search strings should be used in a number of databases, such as Web of Science, ProQuest, Scopus or ScienceDirect as no single source will cover all the literature on a particular topic. These databases may have variations in search terms options (such as the use of Boolean operators or wildcards) and alterations in the search string/s may be necessary. Record any alterations used in the search strings such as those outlined below. An additional search on Google Scholar and Google may be conducted to capture relevant industry reports and additional academic articles of interest that may not have been found through the primary academic databases. Be careful to only utilise grey literature from reputable sources in your research. Keep a record of your search strings and filters, records retrieved, and search dates to be used in the final report and journal article.

Example search string:

( ( "energy performance gap" OR "energy gap" OR "performance gap" ) AND ( building* OR hous* OR home ) AND ( "low carbon" OR "low-carbon" OR "energy efficien*" OR green OR "sustainab*" OR

"net zero energy" OR "zero energy" OR "high efficien*" OR "passive") AND ("construction" OR "commission*" OR "pre-occupancy" OR "life cycle" OR "life-cycle"))

You will need to limit your search results to ensure they are focused and relevant to your research questions. Examples of inclusions and exclusions that can be applied to search strings in databases are:

Inclusions – Limit the search to peer reviewed journal articles in electronic databases only. Articles were limited to those in the English language. You can also use time limitations such as only articles published since 2010. You may also search for the strings in only the title, abstract and keywords to focus the results.

Exclusions – books, book sections, theses, reviews and grey literature.

For the rapid review, you may wish to include terms that limit the search to only review articles. However this may limit the results returned if the database doesn't identify that the article is a review article. It is suggested that you begin with excluding these terms or filters from your search results and screen for these articles yourself through abstract and keyword searchers. However if there is an unmanageable number of results, limiting to only review articles may be appropriate.

It is recommended that you export the search results to reference management software, where duplicates can be excluded. Article titles and abstracts are then screened for relevance. Of the remaining articles, the full-text was screened for relevance, with final articles being additionally sorted to identify review articles. The search and screening process should be summarised in a PRISMA flow diagram [16].

**Data extraction and synthesis**

For each article, you should extract and record the following characteristics shown in Table 2. Results synthesis in rapid reviews is usually descriptive [4]. Although a quantitative summary of the data is sometimes possible, this depends on the nature and quality of the articles analysed [17].

*Table 2 List of the main study variables to be extracted and coded for the included studies, with relevant values*

| Study variable | Description |
|---|---|
| First Author_year | The ID of the article is created by concatenating the last name of the first author and the year published |
| Title | Title of the article |
| Self-claimed study type | Type of study claimed by the authors, the inclusion of grey literature (if provided), the analysis lens used (if provided), and how methodological quality was addressed (if provided) |
| Theme | Research theme addressed in the article |
| Location conditions | General conditions under which the issues are address, and the research scope of the secondary studies' if known |
| Study funding | Funding bodies |
| COI | Declared Conflicts of Interests (COI) |
| Key findings | The studies' main conclusions and findings relevant to the research questions |
| Policy information | Policy type and details if available, or other notes where relevant |

### Quality assessment of selected studies

Assessment of the quality of the included studies is necessary to provide robust results and verification of the rapid review. This can be done through A Measurement Tool to Assess Systematic Reviews version 2 (AMSTAR2) checklist [18], which consists of 16 questions that are answered for each of the articles (Appendix 1). These questions address the studies' methodologies, search strategies, risk of bias assessment and quality of the interpretation of results. The answers for the 16 questions are color-coded and reported in a table, enabling the quality of the articles to be visually verified.

Information on the included studies' funding sources and conflict of interest statements is also recorded. Where available, information was collected to assess the extent to which the articles addressed the study quality criteria. These answers are used to assess a quality score (QS) and Risk of Bias (RoB) for each study. QS values: A – minimal flaws, B – some flaws, C – major flaws in many aspects of the review (most likely due to poor reporting or the review not being a full systematic review of evidence). RoB values: low, medium, high – refer to the risk of bias of the conclusions of the review.

### Writing and review

The rapid review process produces 3 documents: an industry summary, a rapid review report and a journal article for publication. The industry summary is a 2-5 page document that outlines the methods, the main findings of the research and key recommendations. The rapid review report is an in depth document of 30 pages or more that outlines the review process and summarises the findings of the

studies. Finally, the report forms the basis of a journal article for publication in a peer-reviewed journal. An expanded introduction and summation of the research in the context of the literature is often required for the article.

The review of the industry summary and rapid review report by the Industry Research Group are important parts of the rapid review process. This ensures the research is targeted at and appropriate for an industry audience. It also aims to identify future areas of research that can be undertaken by the PhD student that will be beneficial to the industry partners.

Templates for the industry summary and rapid review report are provided at the end of this outline. Examples of published rapid review journal articles can also be provided on request.

Rapid Review Industry Summary Structure

- Title
- Introduction that outlines the rationale and objectives of the rapid review
- Key findings of the rapid review
- List of recommendations
- List of studies reviewed

Rapid Review Report Structure

- Executive summary
- Introduction
    - Rationale
    - Objectives
- Methods
    - Problem definition
    - Eligibility criteria
    - Information sources
    - Literature search and study records
    - Study variables
    - Outcomes and prioritisation
    - Risk of bias in individual studies
    - Data synthesis
    - Meta-bias(es). May not be applicable, due to the qualitative summary nature of the review.
- Results
    - Overview of the included studies
    - Qualitative summary of the results including a table with the main characteristics of the included studies and a summary of the findings and recommendations
    - Overview of the excluded studies
    - Quality, risk of bias and confidence in cumulative evidence
    - Review limitations
- Summary and conclusions
- Appendices
    - Review team members including the industry reference group, the review team and the stakeholders/users
    - Review Gantt chart timeline noting the following actions: review team formation, question refinement, search and screening, data extraction, synthesis/report, approvals/revisions
    - Table of excluded studies at the full-text eligibility stage and reason for their exclusion
    - AMSTAR2 checklist

# Appendix 1

*Table 3 AMSTAR2 checklist for article quality assessment [11]*

| Question (recommendations) | Decision rules and comments |
|---|---|
| Q1. Are the research questions and inclusion criteria for the review clearly delineated? | 1 = "Yes" = Who (Population/Subject), What (Intervention, Comparator group, Outcome), Where and When described. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = research question and inclusion criteria not outlined in detail. |
| Q2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? | 1 = "Yes" = The authors state that they had a written protocol or guide that included ALL the following: review question(s), a search strategy, inclusion/exclusion criteria, risk of bias assessment. |
| | 0.5 = "Can't answer / not sure / partially" = The authors state that they had a written protocol or guide that included ALL the following: review question(s), a search strategy, inclusion/exclusion criteria, a risk of bias assessment. |
| | 0 = "No" = no mention of *a priori* design of the systematic review, as listed above. |
| Q3. Did the review authors explain their selection of the study designs for inclusion in the review? | 1 = "Yes" = explicit justification of the study designs/types included in the review. |
| | 0.5 = "Can't answer / not sure / partially" = more than one online source but no supplementary sources or one online source and one supplementary source. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = only one online source or no supplementary search used |
| Q4. Did the review authors use a comprehensive literature search strategy? | 1 = "Yes" = searched at least 2 databases (relevant to research question), provided key word and/or search strategy, justified publication restrictions (e.g. language), AND searched the reference lists / bibliographies of included studies, searched trial/study registries, included/consulted content experts in the field, where relevant, searched for grey literature, conducted search within 24 months of completion of the review. |
| | 0.5 = "Can't answer / not sure / partially" = searched at least 2 databases (relevant to research question), provided key word and/or general search strategy, justified publication restrictions (e.g., language). |
| | 0 = "No" = no information on search strategy, or not fulfilling criteria for "Yes" and "Partially". |
| Q5. Did the review authors perform study selection in duplicate? | 1 = "Yes" = either ONE of the following: at least two reviewers independently agreed on selection of eligible studies and achieved consensus on which studies to include OR two reviewers selected a sample of eligible studies and achieved good agreement (at least 80%), with the remainder selected by one reviewer. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = only one reviewer involved in the study selection or no description how many reviewers participated in study selection. |
| Q6. Did the review authors perform data extraction in duplicate? | 1 = "Yes" = either ONE of the following: at least two reviewers achieved consensus on which data to extract from included studies OR two reviewers extracted data from a sample of eligible studies and achieved good agreement (at least 8 %), with the remainder extracted by one reviewer. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = only one reviewer involved in the study selection or no description how many reviewers participated in data extraction. |

| | |
|---|---|
| Q7. Did the review authors provide a list of excluded studies and justify the exclusions? | 1 = "Yes" = provided a list of all potentially relevant studies that were read in full-text form but excluded from the review AND justified the exclusion from the review of each potentially relevant study. |
| | 0.5 = "Can't answer / not sure / partially" = only provided a list of all potentially relevant studies that were read in full-text form but excluded from the review, but not justified the exclusion from the review of each potentially relevant study that were read in full-text. |
| | 0 = "No" = No list of studies excluded at a full-text stage. |
| Q8. Did the review authors describe the included studies in adequate detail? | 1 = "Yes" = ALL the following: Who (Population), What (Intervention, Comparator group, Outcome), Where and When described in detail.. |
| | 0.5 = "Can't answer / not sure / partially" = Who (Population), What (Intervention, Comparator group, Outcome), Where and When briefly described, or only some of these described in detail. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no, or partial description of the included studies |
| Q9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review? | 1 = "Yes" = specifically mentions RoB assessment of individual included studies. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. RoB mentioned or not sufficiently assessed (e.g. if multiple sources of bias potentially present, but not all assessed). |
| | 0 = "No" = no mention of RoB assessment of individual included studies. |
| | [*RoB sources: from confounding, from selection bias, from exposure bias, from selective reporting of outcomes, selection of the reported result from among multiple measurements or analyses of a specified outcome*]. |
| Q10. Did the review authors report on the sources of funding for the studies included in the review? | 1 = "Yes" = Must have reported on the sources of funding for individual studies included in the review. Note: Stating that the reviewers looked for this information but it was not reported by study authors, also qualifies. |
| | 0.5 = "Can't answer / not sure / partially" = sources of funding mentioned for individual studies included in the review, or reported only for some of the included studies. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no report of the sources of funding for individual studies included in the review. |
| Q11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? | 1 = "Yes" = The authors justified combining the data in a meta-analysis AND they used an appropriate technique to combine study results and adjusted for heterogeneity if present *AND* investigated the causes of any heterogeneity or adjusted for heterogeneity or confounding if present. |
| | 0.5 = "Can't answer / not sure / partially" = Requirements for "Yes" only partially fulfilled. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no justification of meta-analysis or inappropriate statistical methods were used for quantitatively combining and analysing the data, heterogeneity not assessed. |
| | N/A = "Not Applicable" = No meta-analysis conducted. |
| Q12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? | 1 = "Yes" = included only low risk of bias studies OR the authors performed analyses to investigate possible impact of RoB on summary estimates of effect. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no assessment of the potential impact of RoB. |

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|---|---|
| | N/A = "Not Applicable" = No meta-analysis conducted. |
| Q13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review? | 1 = "Yes" = included only low risk of bias studies OR the review provided a discussion of the likely impact of RoB on the results. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no discussion of the potential impact of RoB in individual studies. |
| Q14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? | 1 = "Yes" = There was no significant heterogeneity in the results OR if heterogeneity was present the authors performed an investigation of sources of any heterogeneity in the results and discussed the impact of this on the results of the review. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = No explanation or discussion of heterogeneity present in the results. |
| Q15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? | 1 = "Yes" = The authors performed graphical or statistical tests for publication bias and discussed the likelihood and magnitude of impact of publication bias. |
| | 0.5 = "Can't answer / not sure / partially" = more than one online source but no supplementary sources or one online source and one supplementary source. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = The authors did not perform any tests for publication bias and did not discuss potential impact of publication bias. |
| | N/A = "Not Applicable" = No meta-analysis conducted. |
| Q16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review? | 1 = "Yes" = The authors reported no competing interests OR the authors described their funding sources and how they managed potential conflicts of interest. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = The authors did not provide statement on competing interests and funding sources, and how they managed potential conflicts of interest. |

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# Rapid Review Industry Summary Project title

Authors and affiliations
Month, year

## Introduction

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## Key findings

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*Figure 1*

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## Recommendations

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*Figure 2*

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**List of studies reviewed**

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RACE for 2030
RELIABLE
AFFORDABLE
CLEAN
ENERGY

# Rapid Review Report

# Title of project

Authors and affiliations

Month, Year

| | |
|---|---|
| Authors | Authors, affiliations and corresponding author |
| Title | |
| Date | |
| Keywords | |
| Publisher | RACE for 2030 |
| Preferred citation | Authors, (date). Title. RACE for 2030, Sydney, Australia. |


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All authors declare no conflicts of interests.

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## Executive Summary

### Background

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### Objectives

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### Data sources

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### Study eligibility criteria

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### Study appraisal and synthesis methods

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### Results

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### Limitations

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### Conclusions and implications

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# Report

## 1. Introduction

### 1.1 Rationale

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### 1.2 Objectives

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## 2. Methods

### 2.1 Eligibility criteria

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### 2.2 Information sources

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### 2.3 Literature search and study records

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Table 1 PRISMA flow diagram of the search and screening process. REF: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:1

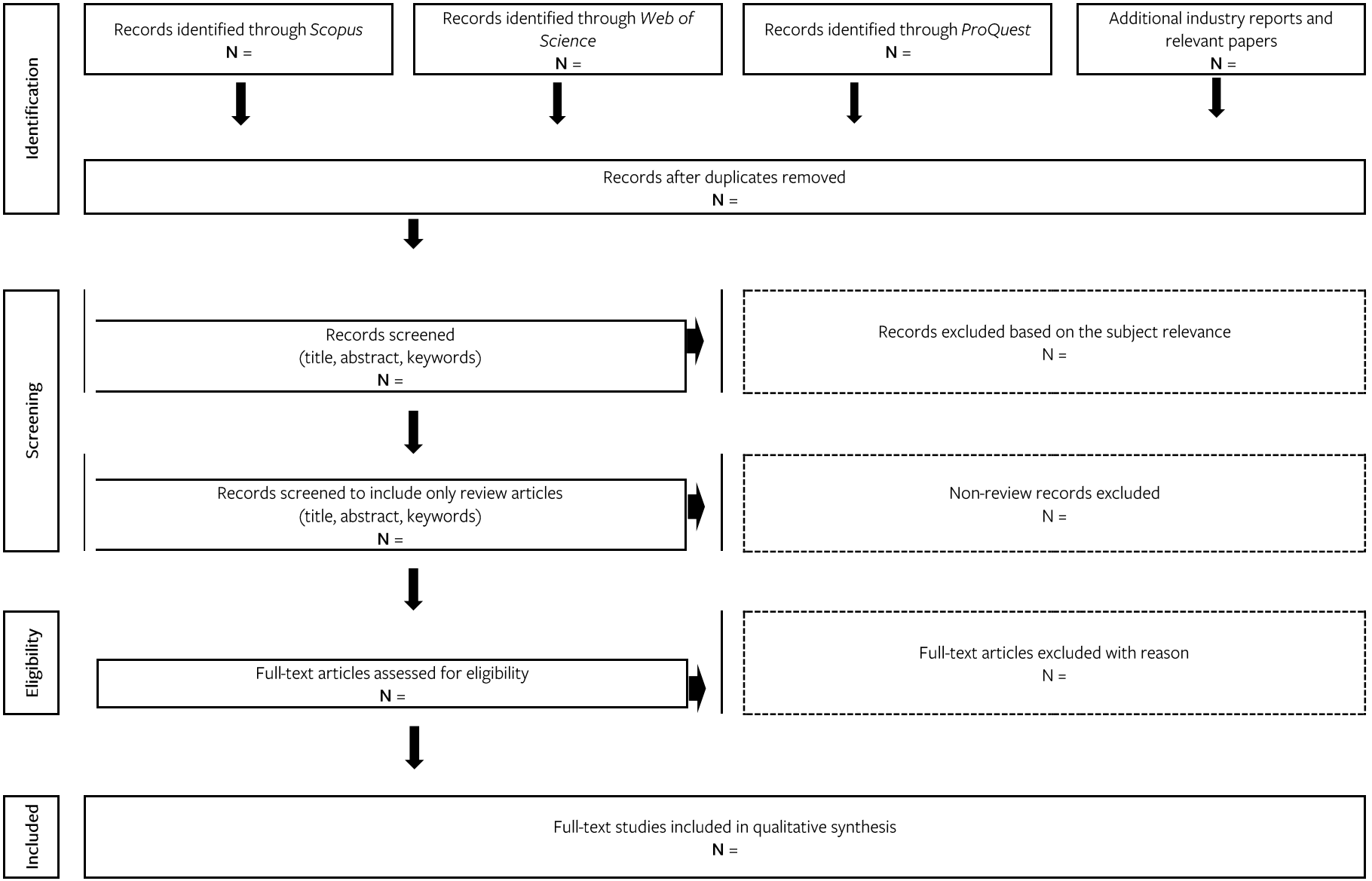

Table 2 Specific search strings and filters applied in different databases

| Search / Database | Search string | Filters |
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## 2.4 Study Variables

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Table 3 List of the main study variables extracted

| Study variable | Description |
|---|---|
| First Author_year | Key (ID) of the article is created by concatenating the last name of the first author and the year published |
| Reference | Full publication reference information, including title of the article |
| Study theme | Main topic addressed in the article |
| Location conditions | Country in which researchers are located and case studies are located |
| Review type | Type of certification scheme considered in the study |
| Number of articles reviewed | Number of certified buildings for which data is reported in the study |
| Study funding | Funding sources declared in the article |
| Conflict of interests | Conflicts of interests declared in the article |

### 2.5 Outcomes and prioritisation

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### 2.6 Risk of bias in individual studies

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### 2.7 Data Synthesis

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### 2.8 Meta-bias(es)

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## 3. Results

### 3.1 Overview of the included studies

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Table 4 List and main characteristics of the included articles.

| First Author _year | Title | Study scope | Theme | Location conditions | Review type | Number articles or case studies included | Study funding | Conflict of interests |
|---|---|---|---|---|---|---|---|---|
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Table 5 Summary of article findings and authors' recommendations for the included studies

| First Author_year | Summary of findings | Summary of recommendations |
|---|---|---|
| | | |

### 3.2 Overview of the excluded studies

Included in appendix.

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### 3.3 Quality, risk of bias and confidence in cumulative evidence

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Table 6 Quality Scores (QS) and Risk of Bias (RoB) summaries for the included studies.

QS values: A – minimal flaws, B – some flaws, C – major flaws in many aspects of the review (most likely due to poor reporting or the review not being a full systematic review of evidence). Risk of Bias (RoB) values: low, medium, high – refer to the risk of bias of the conclusions of the review.

| First Author _year | Title | QS | RoB | Comments |
|---|---|---|---|---|
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### 3.4 Review Limitations

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## 4. Summary and conclusions

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# Appendices

## Review team and timeline

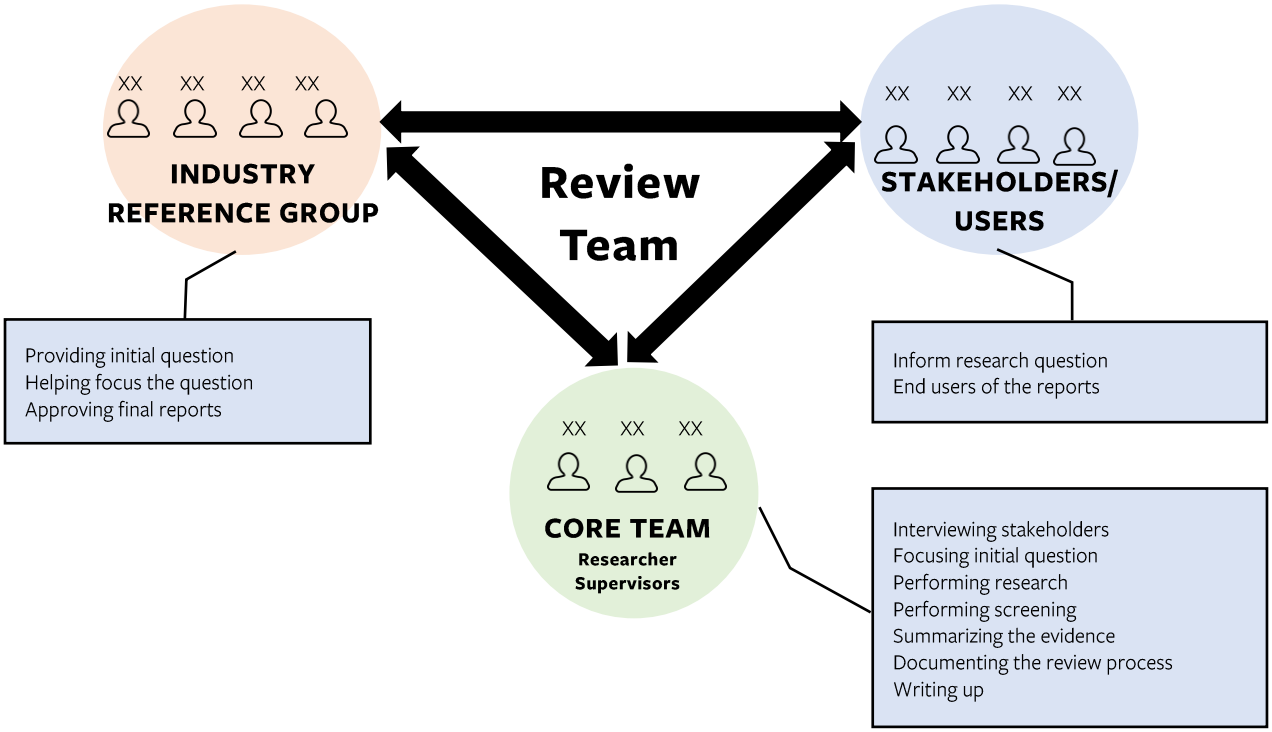


Figure 1 Review team members

Table 7 Review timeline

| Activity | Month | Month | Month | Month | Month | Month |
|---|---|---|---|---|---|---|
| Team formation | | | | | | |
| Question refinement | | | | | | |
| Search and screening | | | | | | |
| Data extraction | | | | | | |
| Synthesis/report | | | | | | |
| Approvals/Revisions | | | | | | |

## Excluded studies

Table 8 Table of the excluded studies at the full-text eligibility stage

| First Author_year | Full reference | Reason for exclusion |
|---|---|---|
| | | |
| | | |
| | | |

## AMSTAR assessment

Table 9 Quality assessment tool.

A modified AMSTAR-2 checklist[1] is used to assess quality and risk of bias of individual systematic reviews / meta-analyses included in this review.

| Question (recommendations) | Decision rules and comments |
|---|---|
| Q1. Are the research questions and inclusion criteria for the review clearly delineated? | 1 = "Yes" = Who (Population/Subject), What (Intervention, Comparator group, Outcome), Where and When described. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = research question and inclusion criteria not outlined in detail. |
| Q2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? | 1 = "Yes" = The authors state that they had a written protocol or guide that included ALL the following: review question(s), a search strategy, inclusion/exclusion criteria, risk of bias assessment. |
| | 0.5 = "Can't answer / not sure / partially" = The authors state that they had a written protocol or guide that included ALL the following: review question(s), a search strategy, inclusion/exclusion criteria, a risk of bias assessment. |
| | 0 = "No" = no mention of *a priori* design of the systematic review, as listed above. |
| Q3. Did the review authors explain their selection of the study designs for inclusion in the review? | 1 = "Yes" = explicit justification of the study designs/types included in the review. |
| | 0.5 = "Can't answer / not sure / partially" = more than one online source but no supplementary sources or one online source and one supplementary source. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = only one online source or no supplementary search used |
| Q4. Did the review authors use a comprehensive literature search strategy? | 1 = "Yes" = searched at least 2 databases (relevant to research question), provided key word and/or search strategy, justified publication restrictions (e.g. language), AND searched the reference lists / bibliographies of included studies, searched trial/study registries, included/consulted content experts in the field, where relevant, searched for grey literature, conducted search within 24 months of completion of the review. |
| | 0.5 = "Can't answer / not sure / partially" = searched at least 2 databases (relevant to research question), provided key word and/or general search strategy, justified publication restrictions (e.g., language). |

[1] B.J. Shea, B.C. Reeves, G. Wells, M. Thuku, C. Hamel, J. Moran, D. Moher, P. Tugwell, V. Welch, E. Kristjansson, D.A. Henry, AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both, BMJ 358 (2017) j4008.

| | |
|---|---|
| | 0 = "No" = no information on search strategy, or not fulfilling criteria for "Yes" and "Partially". |
| Q5. Did the review authors perform study selection in duplicate? | 1 = "Yes" = either ONE of the following: at least two reviewers independently agreed on selection of eligible studies and achieved consensus on which studies to include OR two reviewers selected a sample of eligible studies and achieved good agreement (at least 80%), with the remainder selected by one reviewer. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = only one reviewer involved in the study selection or no description how many reviewers participated in study selection. |
| Q6. Did the review authors perform data extraction in duplicate? | 1 = "Yes" = either ONE of the following: at least two reviewers achieved consensus on which data to extract from included studies OR two reviewers extracted data from a sample of eligible studies and achieved good agreement (at least 8 %), with the remainder extracted by one reviewer. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = only one reviewer involved in the study selection or no description how many reviewers participated in data extraction. |
| Q7. Did the review authors provide a list of excluded studies and justify the exclusions? | 1 = "Yes" = provided a list of all potentially relevant studies that were read in full-text form but excluded from the review AND justified the exclusion from the review of each potentially relevant study. |
| | 0.5 = "Can't answer / not sure / partially" = only provided a list of all potentially relevant studies that were read in full-text form but excluded from the review, but not justified the exclusion from the review of each potentially relevant study that were read in full-text. |
| | 0 = "No" = No list of studies excluded at a full-text stage. |
| Q8. Did the review authors describe the included studies in adequate detail? | 1 = "Yes" = ALL the following: Who (Population), What (Intervention, Comparator group, Outcome), Where and When described in detail.. |
| | 0.5 = "Can't answer / not sure / partially" = Who (Population), What (Intervention, Comparator group, Outcome), Where and When briefly described, or only some of these described in detail. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no, or partial description of the included studies |
| Q9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review? | 1 = "Yes" = specifically mentions RoB assessment of individual included studies. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. RoB mentioned |

| | |
|---|---|
| | or not sufficiently assessed (e.g. if multiple sources of bias potentially present, but not all assessed). |
| | 0 = "No" = no mention of RoB assessment of individual included studies. |
| | [*RoB sources: from confounding, from selection bias, from exposure bias, from selective reporting of outcomes, selection of the reported result from among multiple measurements or analyses of a specified outcome*]. |
| Q10. Did the review authors report on the sources of funding for the studies included in the review? | 1 = "Yes" = Must have reported on the sources of funding for individual studies included in the review. Note: Stating that the reviewers looked for this information but it was not reported by study authors, also qualifies. |
| | 0.5 = "Can't answer / not sure / partially" = sources of funding mentioned for individual studies included in the review, or reported only for some of the included studies. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no report of the sources of funding for individual studies included in the review. |
| Q11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? | 1 = "Yes" = The authors justified combining the data in a meta-analysis AND they used an appropriate technique to combine study results and adjusted for heterogeneity if present *AND* investigated the causes of any heterogeneity or adjusted for heterogeneity or confounding if present. |
| | 0.5 = "Can't answer / not sure / partially" = Requirements for "Yes" only partially fulfilled. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no justification of meta-analysis or inappropriate statistical methods were used for quantitatively combining and analysing the data, heterogeneity not assessed. |
| | N/A = "Not Applicable" = No meta-analysis conducted. |
| Q12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? | 1 = "Yes" = included only low risk of bias studies OR the authors performed analyses to investigate possible impact of RoB on summary estimates of effect. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = no assessment of the potential impact of RoB. |
| | N/A = "Not Applicable" = No meta-analysis conducted. |
| Q13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review? | 1 = "Yes" = included only low risk of bias studies OR the review provided a discussion of the likely impact of RoB on the results. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |

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| | 0 = "No" = no discussion of the potential impact of RoB in individual studies. |
| Q14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? | 1 = "Yes" = There was no significant heterogeneity in the results OR if heterogeneity was present the authors performed an investigation of sources of any heterogeneity in the results and discussed the impact of this on the results of the review. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = No explanation or discussion of heterogeneity present in the results. |
| Q15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? | 1 = "Yes" = The authors performed graphical or statistical tests for publication bias and discussed the likelihood and magnitude of impact of publication bias. |
| | 0.5 = "Can't answer / not sure / partially" = more than one online source but no supplementary sources or one online source and one supplementary source. Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = The authors did not perform any tests for publication bias and did not discuss potential impact of publication bias. |
| | N/A = "Not Applicable" = No meta-analysis conducted. |
| Q16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review? | 1 = "Yes" = The authors reported no competing interests OR the authors described their funding sources and how they managed potential conflicts of interest. |
| | 0.5 = "Can't answer / not sure / partially" = Cannot decide between "yes" and "no", basing on the information provided in the paper. |
| | 0 = "No" = The authors did not provide statement on competing interests and funding sources, and how they managed potential conflicts of interest. |

Table 10 Responses to quality assessment questions from Table 8 coded for each of the included studies.

The responses to each question were coded numerically and color-coded as following: green = 1 = "Yes"; yellow = 0.5 = "Can't answer / not sure / partially", red = 0 = "No", grey = N/A = "Not Applicable".

| First Author _year | Q 1 | Q 2 | Q 3 | Q 4 | Q 5 | Q 6 | Q 7 | Q 8 | Q 9 | Q1 0 | Q1 1 | Q1 2 | Q1 3 | Q1 4 | Q1 5 | Q1 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | |

## References