



UNIVERSITY
of VIRGINIA

JUNE 11, 2019

DATA SCIENCE FOR THE PUBLIC GOOD WORKSHOP

TIPS ON CONDUCTING A LITERATURE REVIEW

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What is a literature review?

Most projects at SDAD start with a literature review.

A literature review provides an overview of what's been written about a specific topic; it is a **focused, systematic, repeatable**, and **critical synthesis** of key research; it tests your research question against what is already known about the topic.

Literature reviews are guided by well-formulated research questions.

- The question starts your entire search process;
- provides focus for your searches; and
- guides the selection of literature sources.

What is a literature review?



In addition - we are always looking to see what other **data sources** researchers are using.

Examples of DSPG research questions

NCSES-Business Innovation

- How do you determine whether a company has launched a new product.

USDA-ERS

- Can we validate the data that is collected by the FCC on broadband availability and subscription rates?
- Based on a review of the literature, what factors are relevant for the prediction of property values?

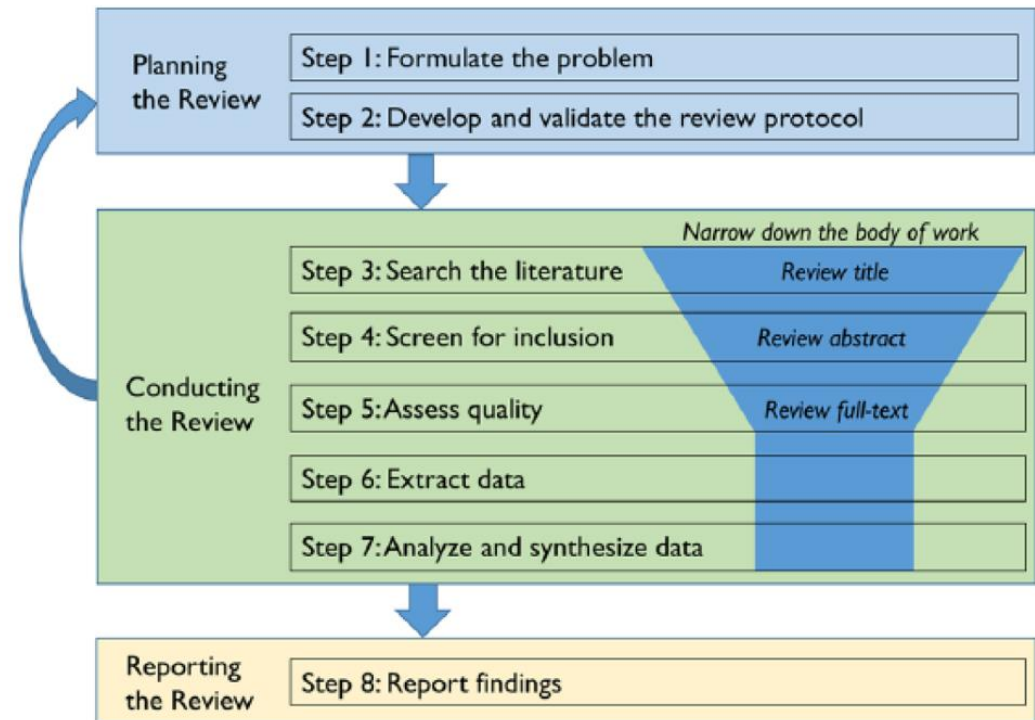
Criminal Justice Project

- What are the summative impacts of education during incarceration? In addition to potential lowered recidivism, what are other benefits?

Literature review process

Common steps of a systematic review:¹

1. formulate the research question
2. develop and validate the review protocol
3. search the literature
4. screen for inclusion
5. assess quality
6. extract data
7. analyze and synthesize data
8. report the findings.



¹ Xiao and Watson, Guidance in Conducting a Systematic Literature Review, Journal of Planning Education and Research, 2019, Vol. 39(1) 93–112

Literature review process

1. **Formulate the Research Question**

The research questions drive the literature review process. This could be an iterative process: is the bulk of material such that research question needs to be narrowed down?

2. **Develop and Validate the Review Protocol**

After the research question is formulated, the research protocol is developed. The research protocol is a planning document that explicitly describes the methods for the review *before any literature searching takes place*. Well-described protocols minimize bias, by guarding against arbitrary decision making during the conduct of the review, and variation from the review methods. They promote research integrity, accountability, and transparency of the completed review.

Literature review process

Examples of what could go into a Review Protocol:

I. **Search Strategies**

Electronic data bases that will be searched, key search terms, any additional sources that will be searched?

II. **Selection Criteria**

Inclusion/exclusion criteria, any additional limits such as publication type, study design, date?

III. **Quality Assessment**

What criteria will be used to assess methodological quality, how will the quality assessment be performed?

IV. **Data Extraction**

What are the key data to be extracted, how will the extraction be performed and presented?

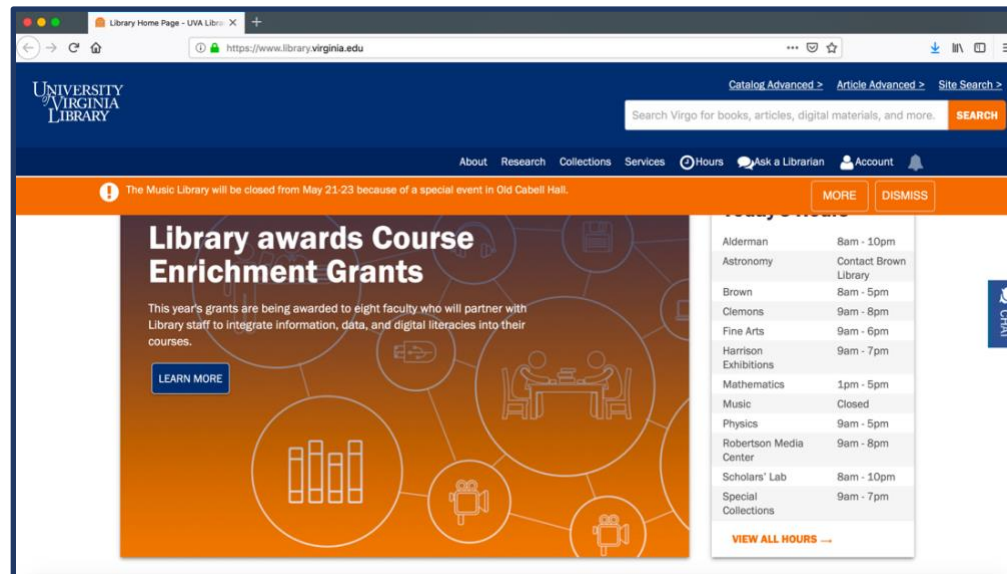
V. **Data Synthesis**

How will the data be combined, what are the potential sources of heterogeneity and how will they be assessed?

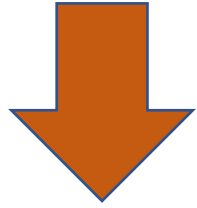
Literature review process

3. Search the Literature

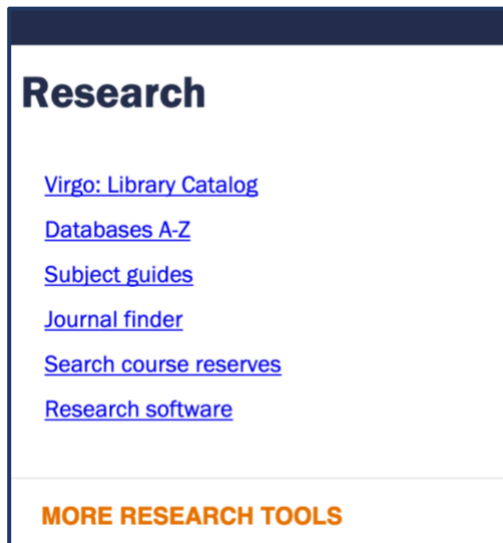
There are three main sources to find literature: *electronic data bases*, *backward searching*, and *forward searching*.



UVA Library home page is <https://library.virginia.edu>. There's a search box (upper right) for the library online catalog, Virgo. Virgo searches books, ebooks, and articles, however, it does not search all the journal articles available online.



Further down on the **UVA Library** home page is the Research box.



A **library database** is a searchable electronic index of published, reliable resources. Databases can be interdisciplinary (spanning several disciplines) or subject-specific (focusing on a particular discipline, such as history, psychology, or literature). Databases

provide research materials from academic journals, newspapers, and magazines. Some databases also include e-books, relevant Web resources, and various multimedia.

Research

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Research

Subject Guides

Doing research in history, or architecture, or biomedical engineering? Looking for videos, newspapers, or census data? Whatever your subject or research need, we have a guide describing the many resources available to you through the UVA Libraries.

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H	I	J	K	L	M	N
O	P	Q	R	S	T	U
V	W	X	Y	Z	ALL	

Research Tips & Tools

Having trouble getting articles from off Grounds? Looking for help creating a bibliography or citing your sources? Need a book or journal that UVA doesn't own? Check out these tips and tools for doing your research.

Need more assistance? [Connect with a subject specialist.](#)

[New Resources at the Library](#)
[Citation Managers](#)
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ALL RESEARCH TOOLS GUIDES

Popular Links tops smiling as they are

[Academic Search Complete](#)

A large database of articles from scholarly journals and newspapers, covering all subjects.

[ARTstor](#)

Images of world art from all periods, including paintings, drawings, prints, historic photographs, architecture and design.

[Dissertations & Theses Global](#)

A searchable index of dissertations, with full text provided from 1997 on. See also [Finding Dissertations](#)

[Factiva](#)

Articles from over 6,000 newspapers and periodicals, plus company and business information.

[JSTOR](#)

Contains older issues of scholarly journals, from first publication to 3-5 years ago.

[LexisNexis Academic](#)

Includes news, business information, legal information, statistics, and more.

[Libra \(UVA's Institutional Repository\)](#)

Libra makes publications available to the world and provides safe and secure storage for the scholarly output of the U.Va. community.

[lynda.com](#)

lynda.com offers video training on business, software, technology and creative skills to achieve personal and professional goals.

[MLA Bibliography](#)

Lists books and articles on literature in all languages.

[Oxford English Dictionary](#)

In addition to definitions, provides quotations illustrating word usage over time.

[PsycINFO](#)

A database of books and journal articles about psychology and related disciplines.

[ScienceDirect](#)

Provides full text of books and articles published by Elsevier Science.

[Web of Knowledge/Web of Science](#)

Indexes journal articles in many subjects, and provides cited reference searching.

[WorldCat](#)

A catalog of books, videos, manuscripts, and other materials in thousands of libraries worldwide.



Claude Moore
Health Sciences Library

Enter information below and press the Submit Information button to send.

ILLiad

You can request documents and books the library does not have through inter-library loan (ILLiad) from the Claude Moore Health Sciences Library:

<https://healthsystem.virginia.hosts.atlas-sys.com/illiad/illiad.dll?Action=10&Form=22>

You will be prompted to login with your UVA computing ID and password before you can request submit a request.

You will also have access to UVA's Research Data Services and fee-based resources such as PolicyMap

Find Data

The U.Va. Library is currently developing its collection of data sources to support quantitative research. This page provides a general overview of the resources available to faculty, staff, and students. For a complete list of all fee-based resources, please see the [Licensed Data Sources](#) page.

Data by Subject

- [Arts, Culture, and Religion](#)
- [Business, Market, and Consumers](#)
- [Census and Demography](#)
- [Crime and Justice](#)
- [Economic and Finance](#)
- [Education](#)
- [Health](#)
- [International Trade](#)
- [Media and Communication](#)
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Data Discovery and Access

[Data Purchase Program](#)

[Find Data](#)

[Licensed Data Sources](#)

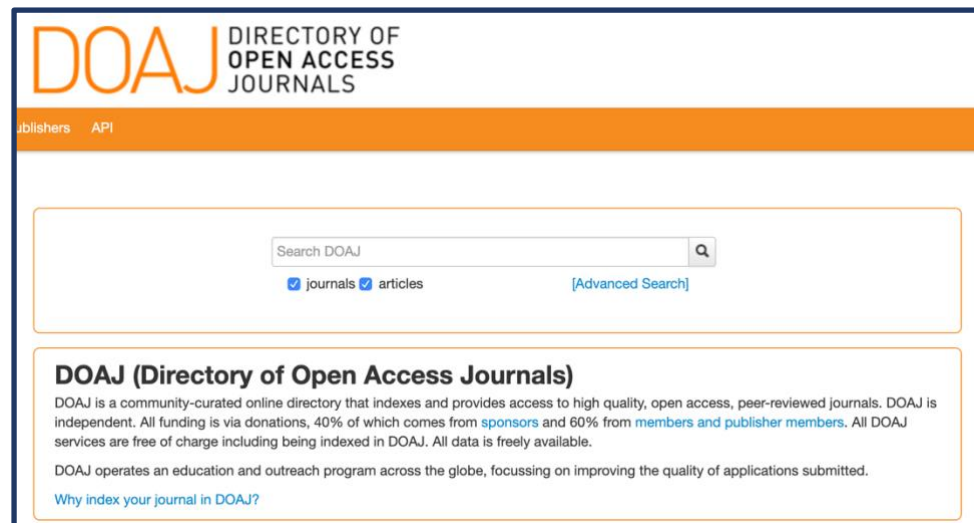
[Data Computer](#)

<https://data.library.virginia.edu/datasources/find-data/>

Literature review process

Because no database includes a complete set of published materials, a systematic search should include multiple databases.

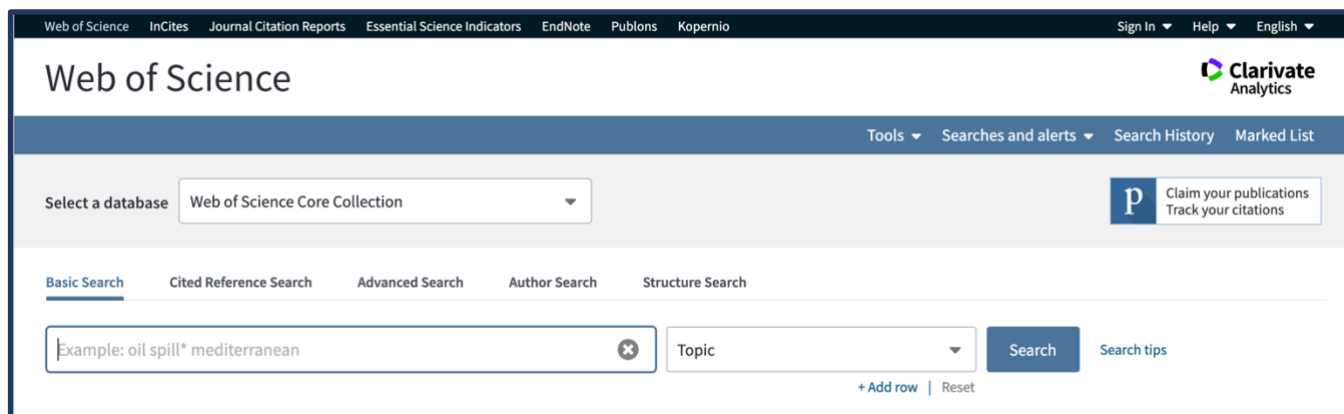
- [Google Scholar](#) is an open access database that archives journal articles as well as “[gray literature](#)” such as conference proceedings, theses, and reports.
- With the increase in open access journal publications, one can search the [Directory of Open Access Journals](#) to find open access journals.



Literature review process

Backward Search: Identify relevant work cited by the articles. The reference list at the back of articles is a good way to find these articles.

Forward Search: Used to find all the articles that have since cited the articles reviewed; Google Scholar and Web of Science (access through the UVA library) allow for a forward search of articles.



The screenshot displays the Web of Science search interface. At the top, a navigation bar includes links to 'Web of Science', 'InCites', 'Journal Citation Reports', 'Essential Science Indicators', 'EndNote', 'Publons', and 'Kopernio'. On the right side of this bar are links for 'Sign In', 'Help', and 'English'. Below the navigation bar, the 'Web of Science' logo is prominently displayed on the left, and the 'Clarivate Analytics' logo is on the right. A secondary navigation bar contains links for 'Tools', 'Searches and alerts', 'Search History', and 'Marked List'. The main content area features a 'Select a database' dropdown menu currently set to 'Web of Science Core Collection'. To the right of this menu is a button with a 'P' icon and the text 'Claim your publications Track your citations'. Below these elements, there are five tabs: 'Basic Search' (which is selected), 'Cited Reference Search', 'Advanced Search', 'Author Search', and 'Structure Search'. The 'Basic Search' tab is active, showing a search input field with the placeholder text 'Example: oil spill* mediterranean'. To the right of the input field is a 'Topic' dropdown menu. A 'Search' button is positioned to the right of the 'Topic' menu. Below the search input field, there are links for '+ Add row' and 'Reset'. A 'Search tips' link is also visible to the right of the 'Search' button.

Literature review process

Many search engines allow the use of Boolean operators² (and, or, not). Connecting words such as **AND**, **OR**, and **NOT** help you to **expand** or **narrow** your search by connecting your topic and each of your main points.

- “**AND**” links *different* concepts together to **narrow** your search.
- “**OR**” uses *different forms of the word* (synonyms) *or related* terms to **expand** your search.
- “**NOT**” excludes words to **narrow** your search by searching for the word before NOT and excluding the word after NOT.

² Boolean Machine <http://rockwellschrock.com/rbs3k/boolean/index.htm> accessed May 22, 2019

Literature review process

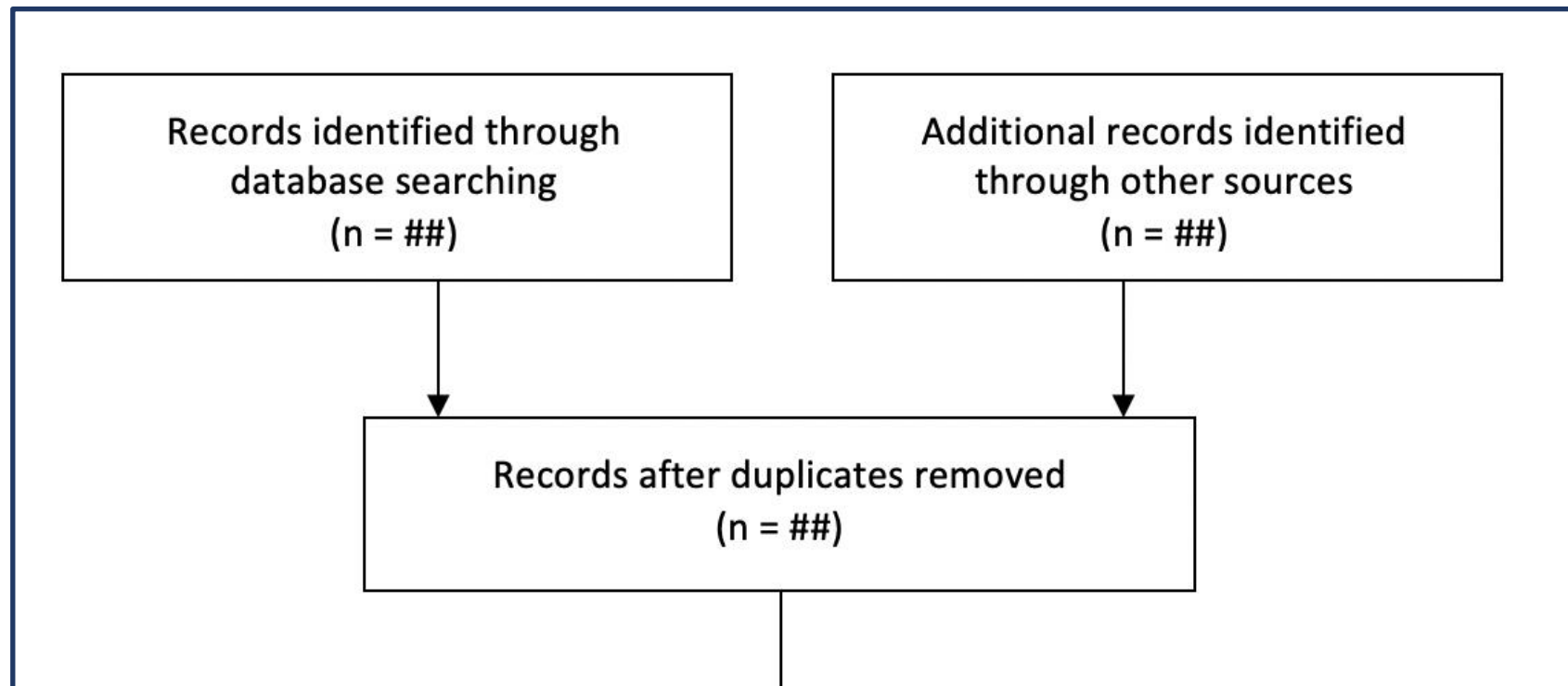
Key words used for the search should be derived from the research questions. You can dissect the research question into concept domains.

Example: What is the impact of **broadband** development on **rural** prosperity, how does it impact **property values**?

Forms	Forms	Forms
wideband	non-urban	home values
Synonyms	Synonyms	Synonyms
internet DSL cable fiber-optic	rustic agrarian country	housing prices farm value
Related Ideas	Related Ideas	Related Ideas
		property taxes

Literature review process

Keep track of the search process....



Literature review process

4. Screen for Inclusion

After the list of references is compiled, the articles are screened for inclusion/exclusion in a **two-step procedure**:

- 1st coarse screen using the abstracts - weed out articles that do not address the research question; and
- 2nd a quality assessment based on a full-text review.

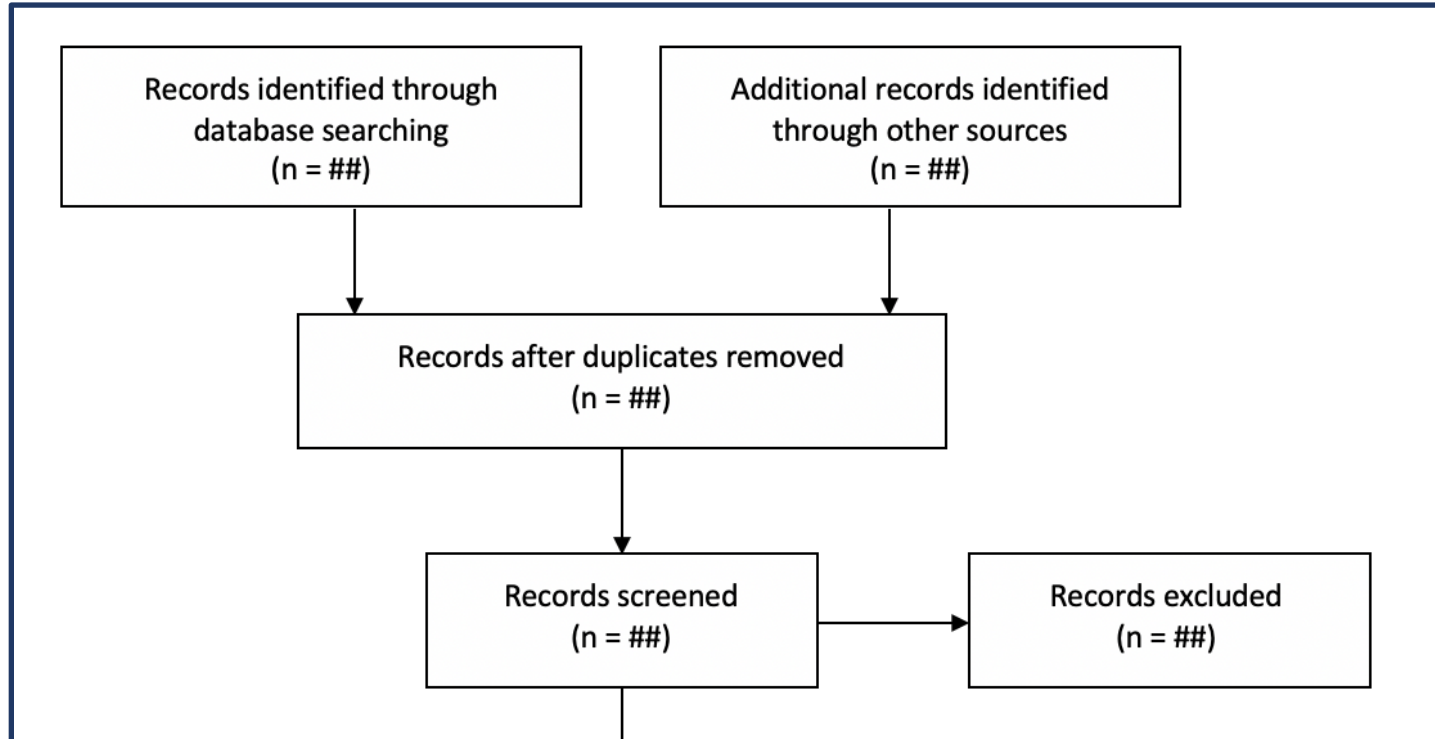
The inclusion/exclusion criteria should be function of the research question constraints. For example, maybe articles are restricted to

- a geographic area (urban versus rural);
- observation unit (household versus census block); or
- time period (pre- versus post- 2009 recession).

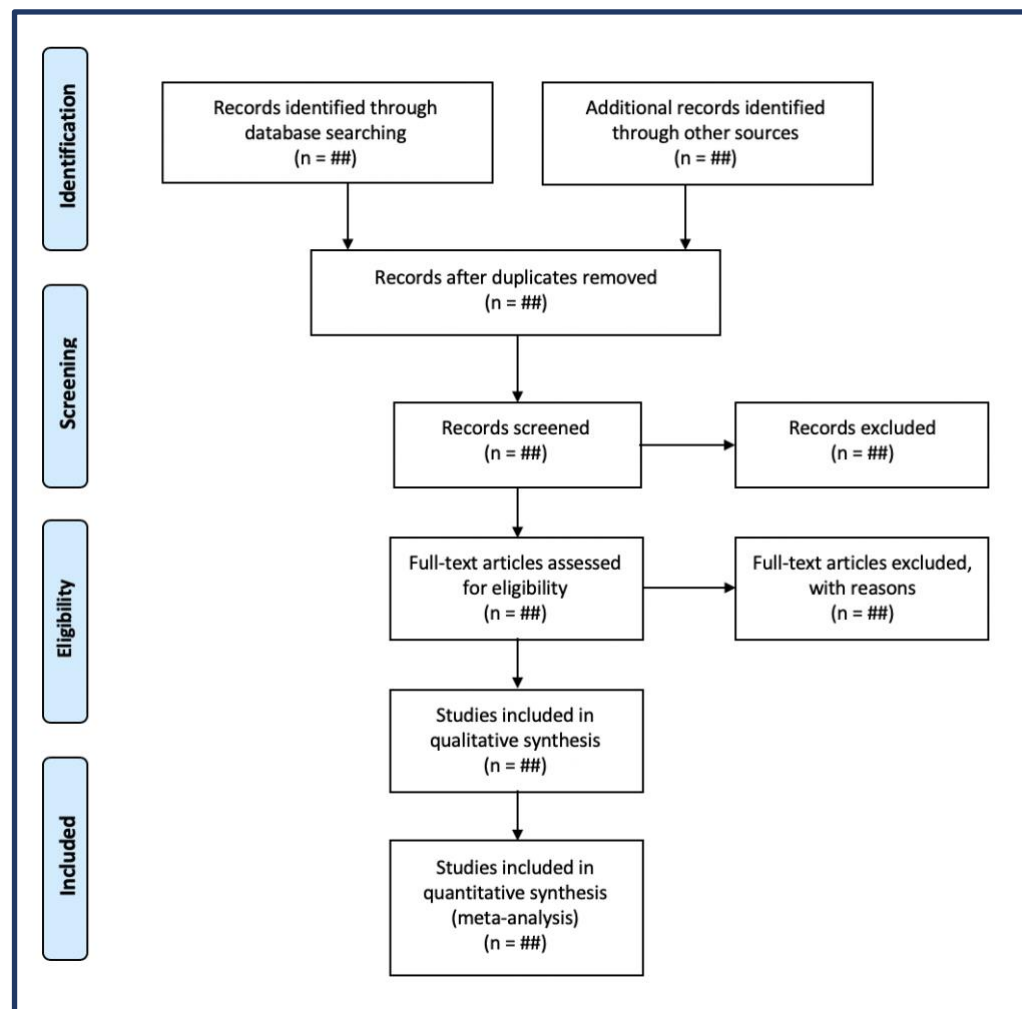
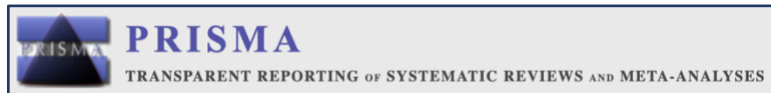
Literature review process

The inclusion/exclusion criteria should be explicitly stated in the review protocol.

Keep track of the screening process....



The findings from the first 4 steps can be displayed in a flow diagram.



Flow Diagram from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group [2009]. Preferred Reporting Items for Systematic Reviews and MetaAnalyses: The PRISMA Statement. PLoS Med 6(7): e1000097.
doi:10.1371/journal.pmed1000097

Literature review process

Steps 5 - **Assess Quality**, 6 - **Extracting Data**, and 7 - **Analyzing and Synthesizing Data**, are a function of the purpose the literature review, the literature type (is the data qualitative, quantitative, or mixed), and review type.

See *Xiao and Watson (2017) Guidance on Conducting a Systematic Literature Review, Journal of Planning Education and Research, Vol 39(1) 93-112, Table 1* for detailed information and references.

Literature review process

8. Report Findings

How the literature review will be incorporated into your project will be a function of your research question:

- it could be a bulleted list of findings for the sponsor,
- a detailed report,
- maybe your literature review was on a single concept in your research question - for example “composite indices” for the Fairfax project and what you learned will help you develop new methodology.

Even though the literature review is not the main focus of these projects, the process should be systematic, and your findings should include sufficient detail to allow other researchers to follow your steps.

An SDAD example

Research Question: What non-cognitive attributes contribute to the performance of an enlisted Soldier? What are the validated constructs of performance that are relevant to first term enlisted soldiers?

Our **screen for inclusion** required:

- validated constructs of performance (character strengths, persistence, integrity, grit, self-regulation, creativity, etc.);
- a definition of the construct;
- access to the instrument used to define the construct; and
- the population the instrument was measured on.

We looked for literature in the Defense Technical Information Center (“gray literature”) and education, sports, management, business, and psychology literature.

Our Step 7 - Synthesizing the literature resulted in a nomological network that linked the constructs together.

