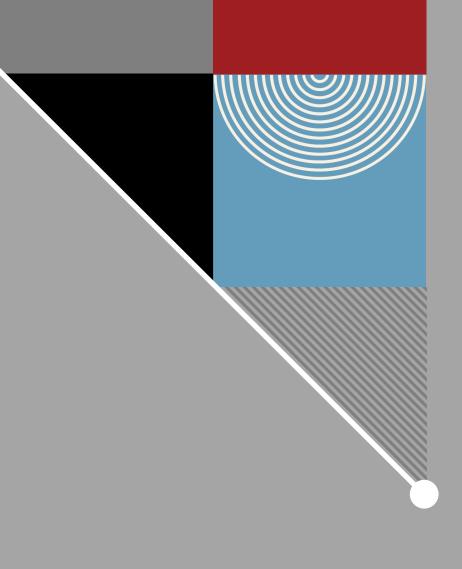


# SYSTEMATIC REVIEWS AND META-ANALYSES

Shelley Facente, PhD, MPH Sara Durán, MPH

Virtual Session 2 of 3



## **COURSE WEBSITE**

• Slides and all other resources you'll need for the course are available at:

https://facenteconsulting.com/srmacourse/

## **CURRICULUM**

Wednesday

Overview of SRs and MAs

PROSPERO and PRISMA

Defining the review question

**PICOS** 

Thursday

Searching for records and studies

Screening records for inclusion

Friday

Extracting and organizing data

Summarizing data and metaanalysis

Evaluating bias

#### In person, Week of Dec 1

Review and practice defining the review question and PICOS criteria to be used

Practice searching for records and screening returned studies

Review of evaluating bias
Practice extracting data

Sensitivity analyses & stratified analyses
Understanding SRMA limitations
Interpreting and reporting results

Reviewing special types of SRs and MAs Final chance for Q&A from the course



#### PROSPERO VS. OSF FOR PRE-REGISTRATION

### PROSPERO is just for health and public health-related systematic reviews

- Many journals will ONLY accept SRs pre-registered in PROSPERO:
  - For example, BMJ journals, BMC journals only accept PROSPERO
- However, Elsevier and other journals accept either as long as PRISMA is followed and registration proof is provided (regardless of system)
- PLOS journals may accept OSF registration, but they recommend PROSPERO and some will not accept OSF registration
- Approval takes a few weeks unless the information is complete; work can begin while waiting for 'approval!

#### **OSF** allows for preregistration of any study in any discipline.

- It is accepted by many journals, but not all.
- Most acceptable when PROSPERO is not relevant, PROSPERO doesn't accept the review, or if the SR is registered in both.

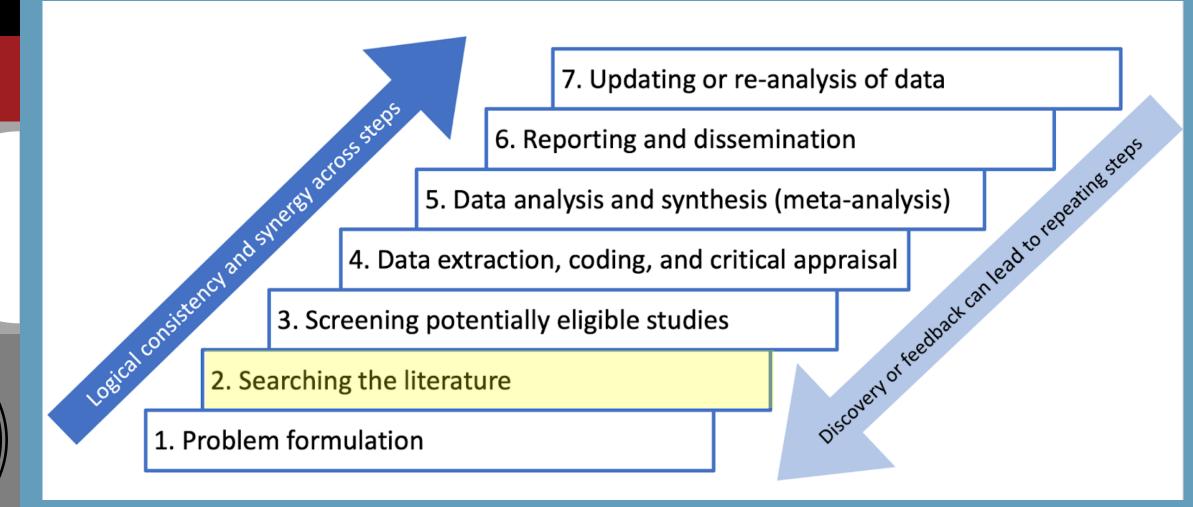


#### PROSPERO VS. OSF FOR PRE-REGISTRATION

Other registration options include (but are not limited to):

- INPLASY (global but used most often among Asia-based researchers) for health and non-health related SRs. <u>Has fees</u> and is only moderately recognized by journals.
- **RESEARCH REGISTRY** (global) for health research including SRs (and more). Allows updates and is recognized in some journals
- CINAHL (specifically nursing related) and has limited recognition except in nursing journals
- COCHRANE REVIEW (requires affiliation/account)

## SYSTEMATIC REVIEWS PROCESS

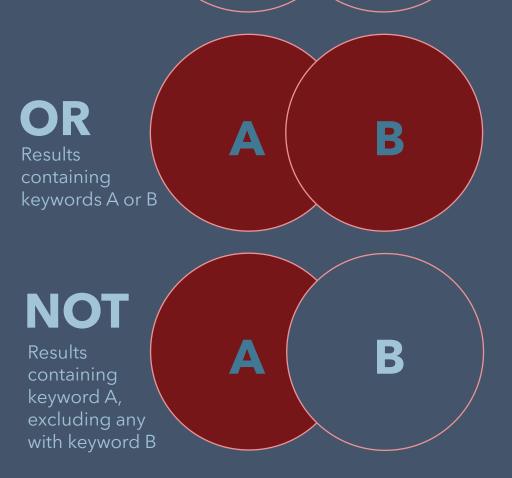


# SEARCHING THE RECORDS FOR STUDIES - DEVELOP AND SEARCH WITH KEY TERMS

- Add terms by specifying terms that answer:
  - Geography (Where should studies have taken place?)
  - Population (Who is the population of focus/key populations?)
  - Method (What method/intervention are you interested in?)
  - Health condition (What is the health condition of interest?)
  - Social determinant of health (Are you interested in a specific social condition, such as economic status, housing status, or resource access?)
  - Time period (When should studies have taken place? All time, last 10 years, post-COVID?)
  - And more!

- **AND** Only results that contain both keywords

- Search terms and operators
- Boolean Operators
  - And, Or, Not



- Search terms and operators
- Boolean Operators
  - And, Or, Not
- Proximity Operators
  - NEAR, WITHIN (and others!)

Health N3 factors

All occurrences of health and factors that are within 3 words of one another

Health factors

Factors impacting health

Factors negatively impacting health

- Search terms and operators
- Boolean Operators
  - And, Or, Not
- Proximity Operators
  - NEAR, WITHIN (and others!)
- Syntax/Code is specific to the database you are searching

Hypertension W5 diabetes

All occurrences of hypertension followed by diabetes within 5 words (in that particular order)

Hypertension with juvenile diabetes

Hypertension in adult onset diabetes

Hypertension may predispose someone to diabetes

- Search terms and operators
- Boolean Operators
  - And, Or, Not
- Proximity Operators
  - NEAR, WITHIN (and others!)
- Syntax/Code is specific to the database you are searching
- Avoid truncation











# **Examples of Sources**



#### "Literature"

 Peer-reviewed journals, published scientific reports, studies (PubMed, Embase, PsycINFO, others)

#### **Government Agencies**

- WHO
- Vietnam Ministry of Health (MoH -General Dept. of Preventive Medicine)
- VIHEMA (Health Environment Management Agency)

#### **Other Agencies/Organizations**

- Healthcare systems
- Disease-specific organizations
- Professional Health Associations
- Reputable health foundations

- Thailand Ministry of Public Health (MOPH)
- Thailand National Health Security Office (NHSO)
- Thailand Health System Research Institute (HSRI)
- City, Provincial health departments

# CONSIDERATIONS FOR EVALUATING SOURCES

- ✓ Purpose of the website
- ✓ Does the URL end in .org(.vn) or .or(.th), .gov(.vn) or .go(.th), .edu(.vn) or ac.th?
  - ✓ If not, be even more cautious regarding the information in the source
- ✓ Timeliness of information
  - ✓ Are data updated regularly?
  - ✓ Does the site indicate when it was last updated?
- ✓ Is content verifiable and are references available on the site?
- ✓ Is there information on contacting the author or organization?



PubMed (demonstration)

Other databases for searching records on studies include:

- Embase
- PsycINFO
- ScienceDirect
- WHO
- EBSCO
  - Health Source: Nursing/Academic Edition
  - MEDLINE



### **SEARCH SETS**



- Search sets are a set of criteria (terms and operators) that make up a query within a search function for a database
- Save these (by making an account) to work off of your previous search set
  - Or at least keep a record of it
- Search sets can be combined!

### **DEVELOPING THE SEARCH SET**

First decide what you want your search sets to be, in plain language.

What main terms?
How else might
researchers have
referred to them?
What Boolean
operators do you
want to use?

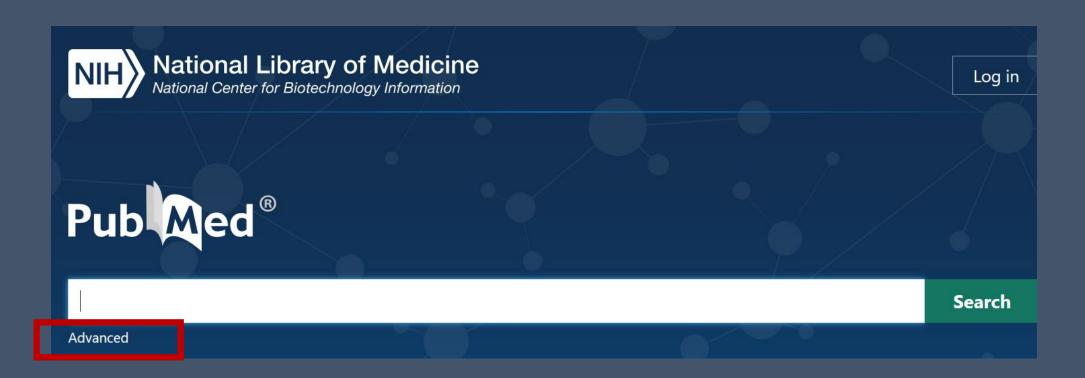
Search terms to be included in searches of titles, abstracts, and MeSH terms/author keywords.

Location	Type of study	Intervention focus
Appalachia or	Trial or	Smoking or
Appalachian	Randomized or	Tobacco or
	Randomised	Smoker or
		Smokers or
OR		Cigarette or
		Cigarettes or
Rural		E-cigarette or
AND		E-cigarettes or
West Virginia or		Electronic cigarettes or
Alabama or		Electronic cigarette
Georgia or		Vaping
Kentucky or		AND
Maryland or		Cessation
Mississippi or		
New York or		OR
North Carolina or		Anti conclina
Ohio or		Anti-smoking
Pennsylvania or		
South Carolina or		
Tennessee or		
Virginia		

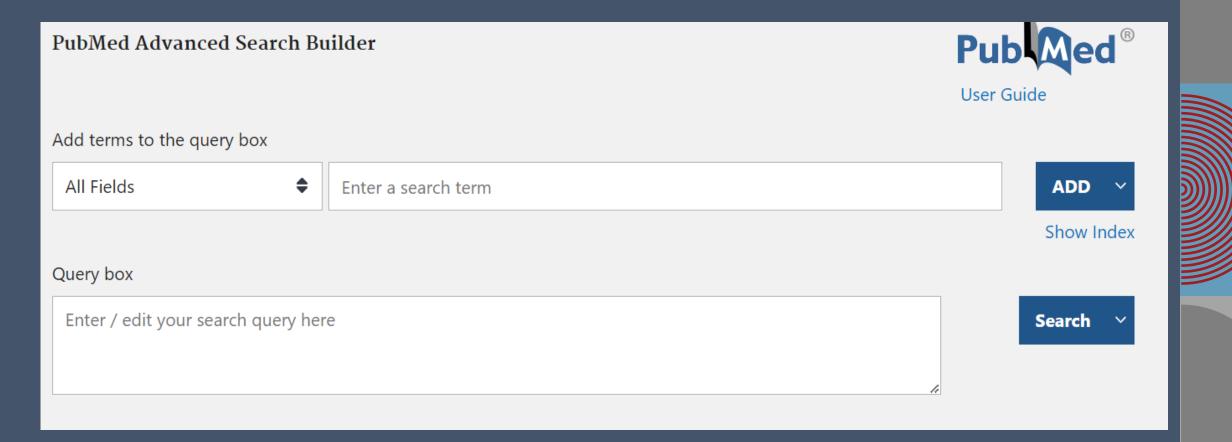


# INPUTTING THE SEARCH SET INTO PUBMED

Click advanced under the search bar



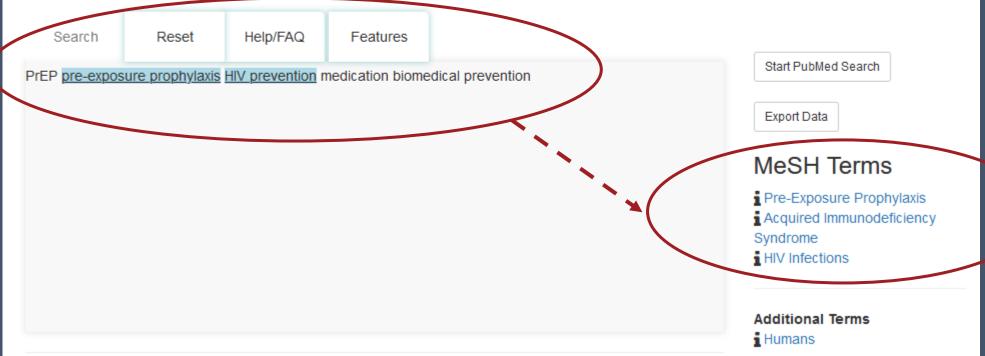
## **PUBMED**

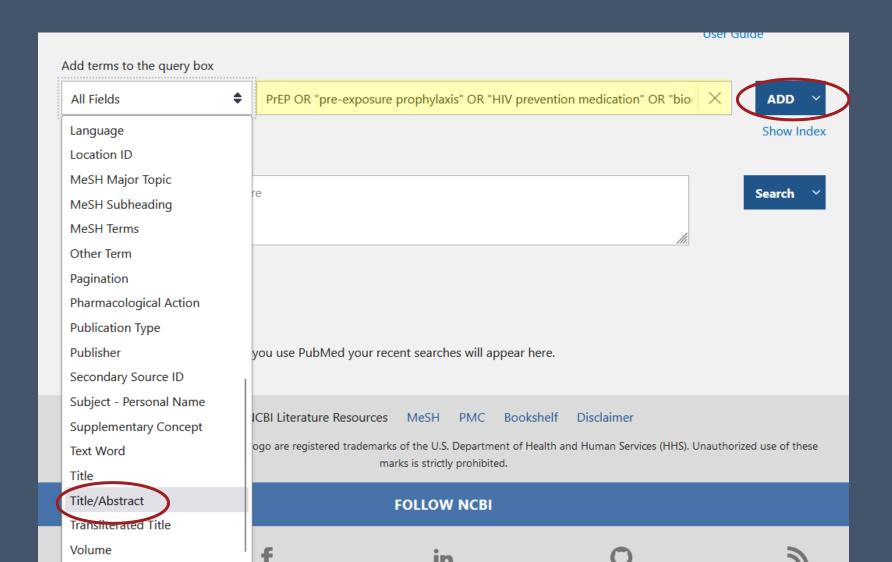


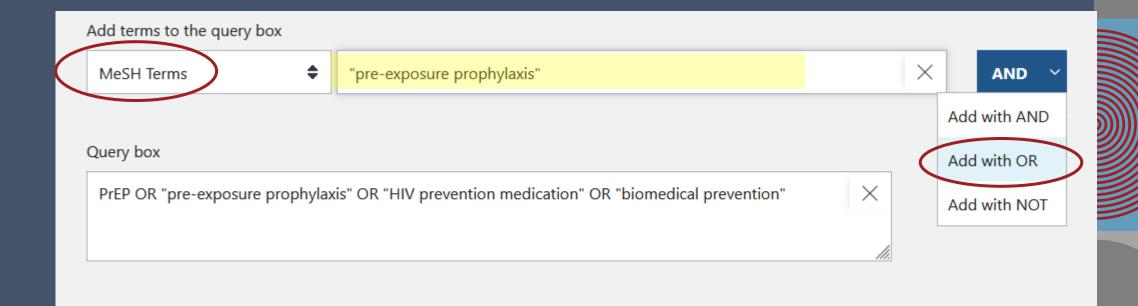
## LOOKING UP MESH TERMS

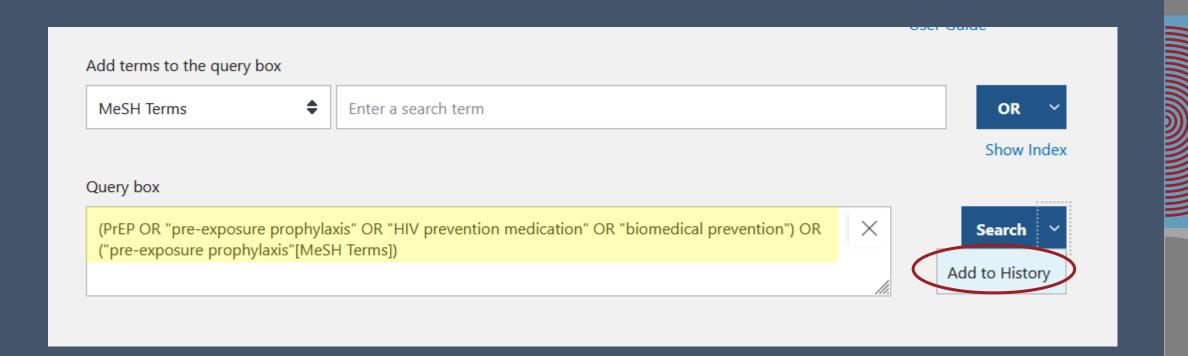


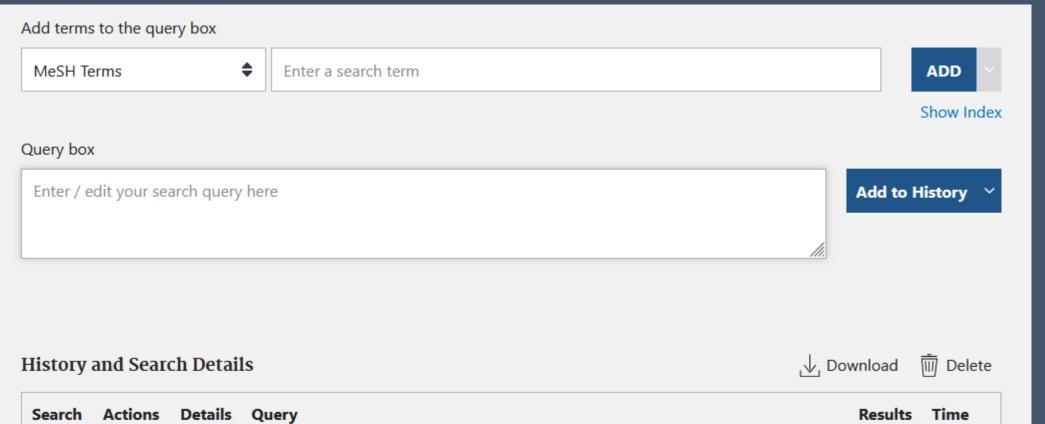
MeSH on Demand identifies MeSH® terms in your submitted text (abstract or manuscript). MeSH on Demand also lists PubMed similar articles relevant to your submitted text.











5	Search	Actions	Details	Query	Results	Time
	#1	•••	>	Search: (PrEP OR "pre-exposure prophylaxis" OR "HIV prevention medication" OR "biomedical prevention") OR ("pre-exposure prophylaxis"[MeSH Terms])	18,116	20:46:16

Showing 1 to 1 of 1 entries

Query box

#1 AND #2 AND #3

Add to History 

Add to History

#### **History and Search Details**



Search	Actions	Details	Query	Results	Time
#3	•••	>	Search: ("South Africa"[Title/Abstract]) OR ("South Africa"[MeSH Terms])	69,897	20:48:08
#2	•••	>	Search: (HIV[MeSH Terms]) OR (HIV[Title/Abstract])	383,218	20:47:50
#1	•••	>	Search: (PrEP OR "pre-exposure prophylaxis" OR "HIV prevention medication" OR "biomedical prevention") OR ("pre-exposure prophylaxis" [MeSH Terms])	18,116	20:46:16

Showing 1 to 3 of 3 entries

istory	and Sear	cii Detai	15		III Delete
Search	Actions	Details	Query	Result	ts Time
#4	•••	>	Search: #1 AND #2 AND #3	50	2 20:50:25
#3	•••	>	Search: ("South Africa"[Title/Abstract]) OR ("South Africa"[MeSH Terms])	69,89	7 20:48:08
#2	•••	>	Search: (HIV[MeSH Terms]) OR (HIV[Title/Abstract])	383,21	8 20:47:50
#1	•••	>	Search: (PrEP OR "pre-exposure prophylaxis" OR "HIV prevention medication" OR "biomedical prevention") OR ("pre-exposure prophylaxis" [MeSH Terms])	18,11	6 20:46:16

#### Case study

#### 2.2. Search strategy and study procedure

We searched potential studies via PubMed, EMbase and Cochrane Library (Appendix S1, supporting information) and the search strategy was developed with the assistance of a specialist librarian. We also searched references within the published reviews to identify further studies. We conducted the literature search at the beginning of 2019 and limited our search to studies published in English and between 1 January 2017 and 31 December 2017. This allowed sufficient time for MeSH/Emtree indexing to be completed before the search for published manuscripts.

Two teams of paired reviewers, trained in trial and SR methods, screened abstracts and full texts for eligibility and extracted data from eligible studies using standard detailed instructions. Any conflicted not resolved by discussion between reviewers were referred to the study team for discussion.

#### Appendix S1 Search strategy

#### PubMed:

- #1 "Specialties, Surgical"[Mesh]
- #2 "Surgical Procedures, Operative" [Mesh]
- #3 "Surgery" [Subheading]
- #4 Surgery [tw] OR surgeries [tw] OR surgerys [tw]
- #5 Operation [tw] OR operations [tw]
- #6 Surgical procedure\*[tw] OR Surgical operation\*[tw] OR Surgical treatment\*[tw] OR Surgical therap\*[tw] OR Surgical intervention\*[tw] OR Surgical research\*[tw]
- #7 Operative procedure\*[tw] OR Operative operation\*[tw] OR Operative treatment\*[tw] OR Operative therap\*[tw] OR Operative intervention\*[tw] OR Operative research\*[tw] Invasive procedure\*[tw] OR Invasive intervention\*[tw]
- #8 Peroperative procedure\*[tw] OR Peroperative intervention\*[tw] OR Perioperative procedure\*[tw]
- OR Perioperative intervention\*[tw] OR Preoperative procedure\*[tw] OR Preoperative intervention\*[tw]
- OR Intraoperative procedure\*[tw] OR Intraoperative intervention\*[tw]
- #8 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7
- #9 "Review Literature as Topic" [Mesh] OR "Meta-Analysis as Topic" [Mesh]
- #10 "Meta-Analysis" [Publication Type]
- #11 Meta-analy\*[tw] OR meta analy\*[tw] OR Metaanaly\*[tw] OR systematic review\*[tw]
- #12 Cochrane[tiab] OR Embase[tiab] OR medline[tiab] OR pubmed[tiab] OR medlars[tiab]
- #13 Psychlit[tiab] OR psyclit[tiab] OR Cinahl[tiab] OR cinhal[tiab] OR Science citation index[tiab] OR Bids[tiab] OR Cancerlit[tiab]
- #14 Reference list\*[tiab] OR bibliograph\*[tiab] OR Hand-search\*[tiab] OR Relevant journals[tiab] OR Manual search\*[tiab]
- #15 Selection criteria[tiab] OR data extraction[tiab]) AND Review[Publication Type]
- #16 Comment[Publication Type] OR letter[Publication Type] OR editorial[Publication Type]
- #17 #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16
- #18 #8 AND #17
- #19 animals [Mesh]
- #20 humans [Mesh]
- #21 #19 NOT #20
- #22 #18 NOT #21

#### Case study

#### 2.2. Search strategy

Publications (up to 30 April 2020) were searched in PubMed and Web of Science. After analysis, the references of the selected publications were also searched. A preliminary division of the existing psychiatric and psychological diseases into groups was carried out. The following were distinguished: anxiety/phobias, other mental disorders, pain <u>perception</u>, <u>neurodevelopmental disorders</u> and post-traumatic stress disorder (PTSD, which was also included in anxiety/phobias). Then, additional keywords were specified within each group in order to broaden the spectrum of the searched conditions. 'Fear', 'phobias', 'agoraphobia', 'aviophobia', 'claustrophobia', 'panic', 'social phobia' and 'spiders' were added for anxiety/phobias. 'Eating disorder', 'depression', 'mental disorder', 'developmental disability', 'psychosis' and 'schizophrenia' were added for other mental disorders. For pain perception we added 'burn pain' and 'phantom limb pain'; for neurodevelopmental disorders we added 'paediatric psychology' 'children', 'autism' and 'cerebral palsy'. All these keywords were combined with 'virtual reality', 'augmented reality', 'exergaming' and 'review' or 'meta-analysis'.

#### Case study

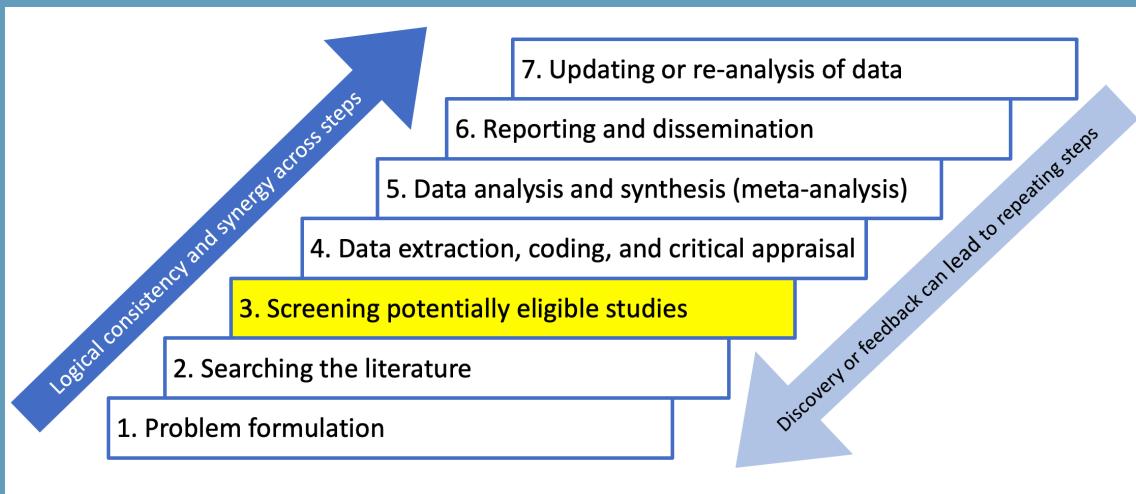
#### 2.1 Data search strategy

Web of Science, Embase, PubMed and Cochrane Library were searched to identify literature on awareness of PrEP and willingness to use HIV PrEP among MSM. A combination of relevant keywords and medical subject heading (MeSH) terms were adopted to conduct the literature search using Boolean operators, truncations and synonym extensions, as appropriate. Detailed search strings used in each database are shown in File S2.

#### Search terms for PubMed

((intention OR intentional OR intent OR intend OR willingness OR will OR utilization OR utilisation OR acceptance OR acceptability OR adoption OR uptake OR usage OR use OR awareness OR adherence OR knowledge OR attitude OR perception OR feasibility)) AND (pre-exposure prophylaxis OR preexposure prophylaxis OR "PrEP" OR HIV pre-exposure prophylaxis OR pre-exposure antiretroviral prophylaxis OR pre exposure antiretroviral prophylaxis OR pre-exposure chemoprophylaxis OR preexposure chemoprophylaxis OR anti-HIV prophylaxis) AND((men who have sex with men OR MSM OR gay OR bisexual OR transgender OR transgender women OR transwomen OR high risk behavio\* OR high risk group\* OR key population\*[Mesh])) AND (human immunodeficiency virus[Mesh] OR HIV[Mesh] OR HIV-positive[Mesh] OR acquired immunodeficiency syndrome OR AIDS OR HIV/AIDS)

## SCREENING RECORDS/STUDIES



### SCREENING GUIDE

- Why is screening important?
- Develop a screening guide, which includes screening questions.
- Many studies have multiple reports - be sure to identify these and link their references (this can be done in Zotero)

Stick to these principles in designing your screening guide:

- 1. Questions should be clear (with understandable wording)
- 2. Questions should be understood similarly (using common language) by all screeners
- 3. Each question should only be one question (no double-barreled questions)
- 4. Questions should be 'low-inference' (so screeners don't have to make complex judgments)

## ZOTERO

- https://www.zotero.org/
- Completely free, open source
- Available for Mac, Windows, Linux
- Zotero connector is an internet plug-in that makes it very easy to save references to your
   Zotero library (works with many different browsers)



#### Zotero 7 for Windows

Your personal research assistant

Download (64-bit)

Also available: Windows ARM

Installation Help



#### **Zotero Connector**

Save from your browser with a single click

Install Chrome Connector

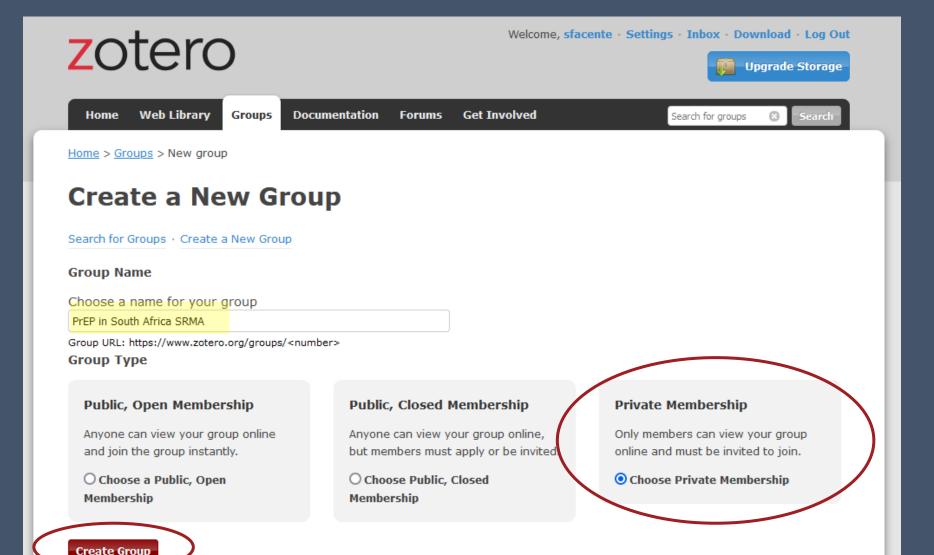
### **CREATE ZOTERO GROUPS!**

- Register for a free account
- On Zotero.org, pick "Groups" at the top

ZOTERO Web Library Groups Documentation Forums Get Involved sfacente Upgrade Storage

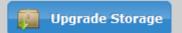
Your personal

### **CREATE ZOTERO GROUPS!**



## CREATE ZOTERO GROUPS!





Web Library

Groups

Documentation

**Get Involved** Forums

Search for groups

× Search

Home > Groups > PrEP in South Africa SRMA > Settings

#### **PrEP in South Africa SRMA: Members Settings**

Group Settings · Members Settings · Library Settings

#### **Current Members**

Username	Full Name	Member Since	Role
<u>sfacente</u>	sfacente	2020-09-09 15:04:40	Owner

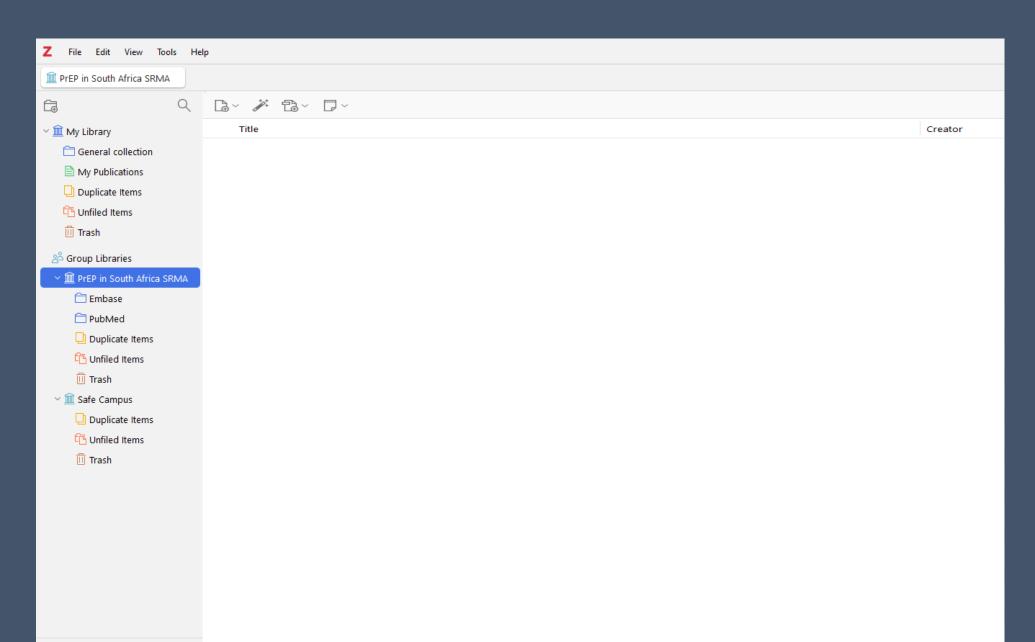
**Update Roles** 

#### **Member Invitations**

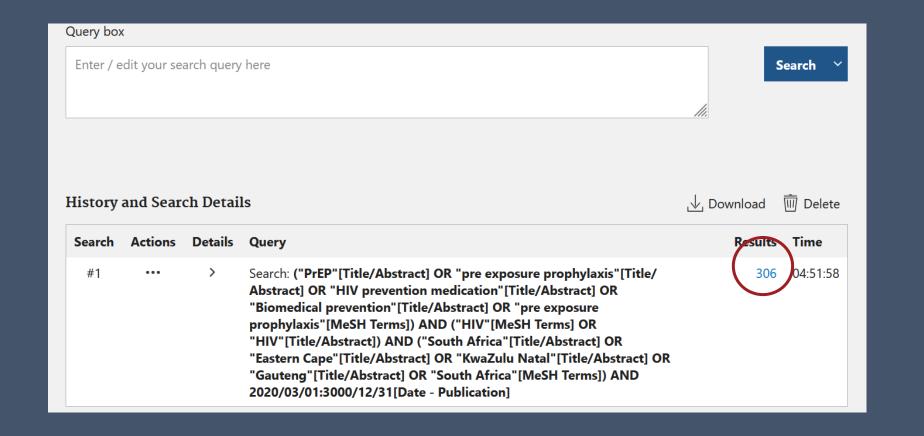
No pending invitations.

Send More Invitations

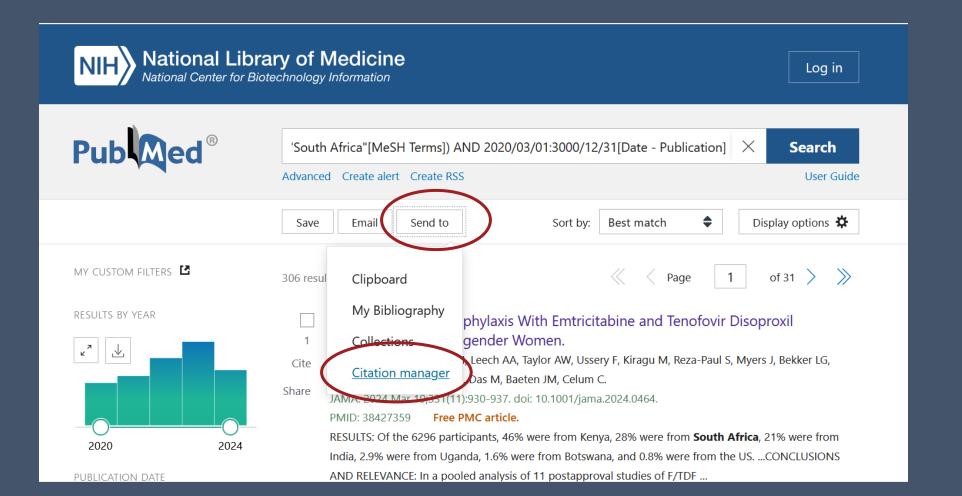
## **ZOTERO - HOW TO USE**



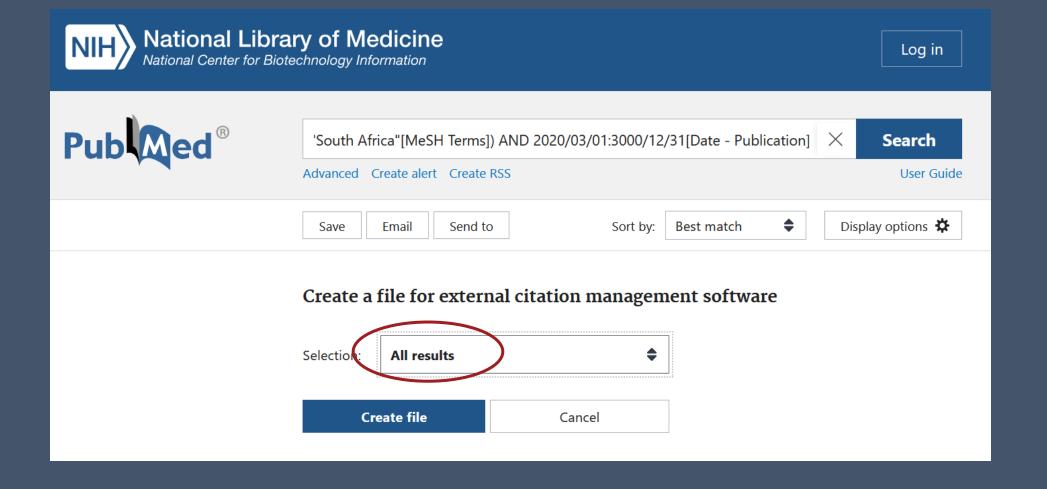
# EXPORTING A FILE OF RECORDS FROM YOUR PUBMED SEARCH



## EXPORTING A FILE OF RECORDS FROM YOUR PUBMED SEARCH

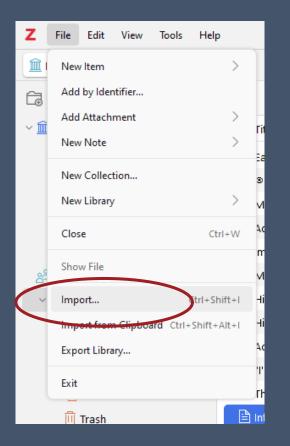


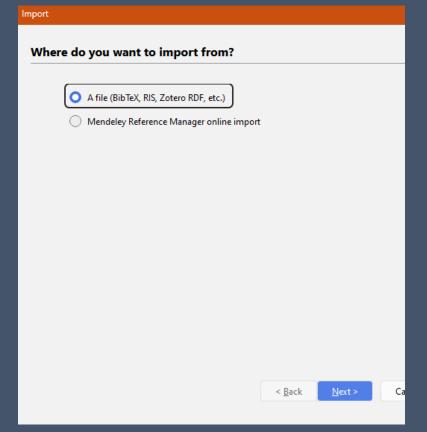
## EXPORTING A FILE OF RECORDS FROM YOUR PUBMED SEARCH

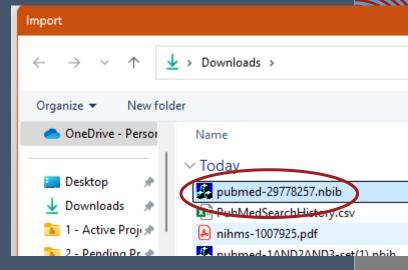


### ZOTERO - ORGANIZING YOUR REFERENCES

3. Import the file you downloaded from your search (e.g. from PubMed)

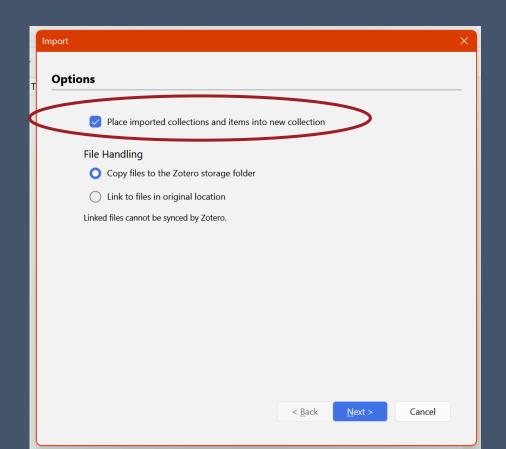






### ZOTERO - ORGANIZING YOUR REFERENCES

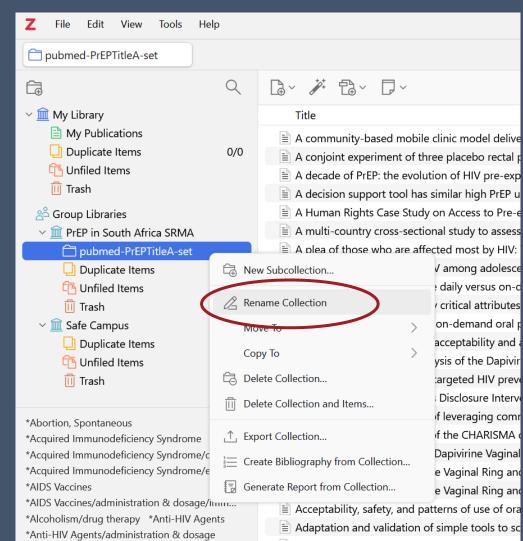
4. Import the file you downloaded from your search (e.g. from PubMed)



### ZOTERO - ORGANIZING YOUR

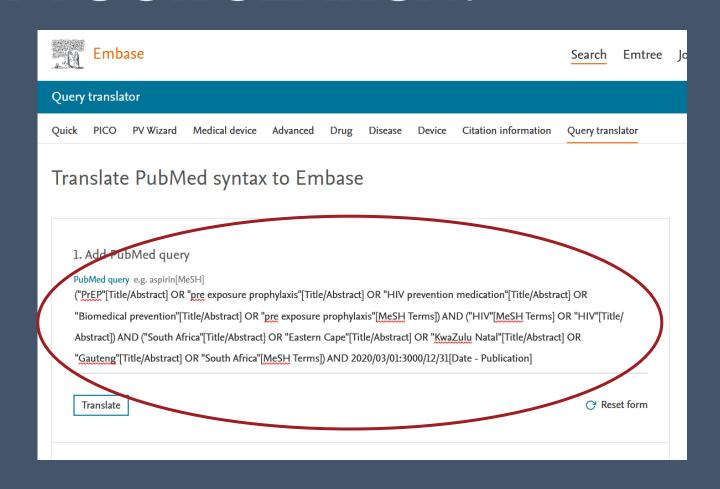
REFERENCES

- 1. You can right click on the collection that Zotero added during import, and rename the collection.
- 2. Name it "PubMed Results (#)" for example, in this case it is
  going to be PubMed Results
  (306). This is important so that
  later you have an easy way of
  knowing how many searches
  were returned from that
  database, when you go to write
  your paper and Figure 1!

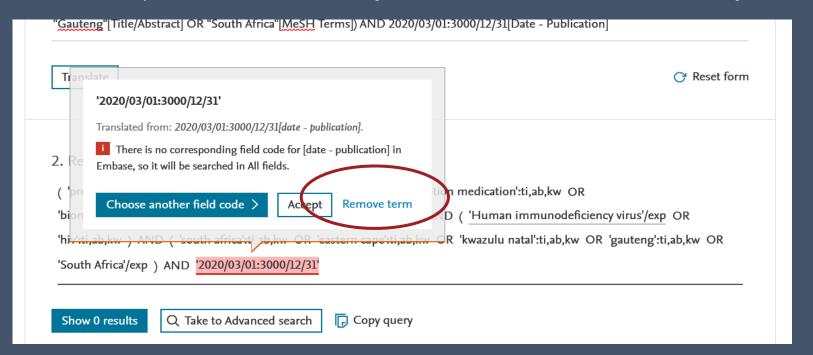


For this example, let's take our original PubMed search and search Embase - you can use Embase's Query Translator to make this easy.

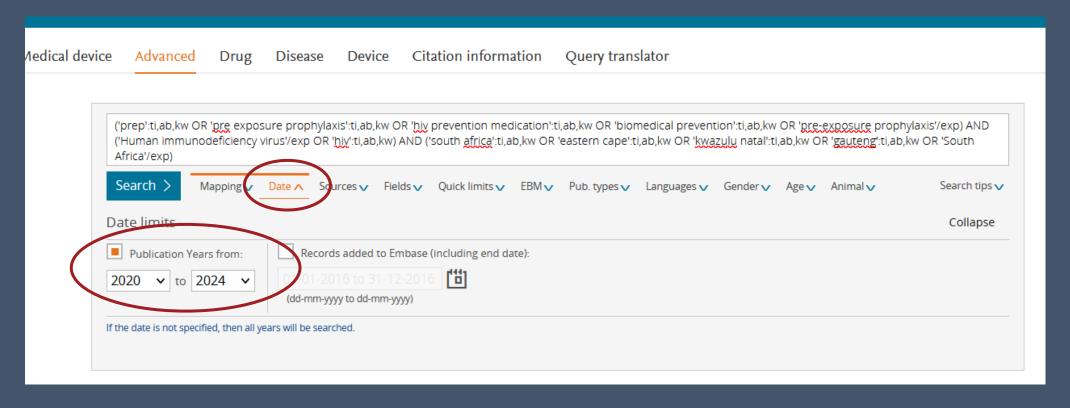
Paste in the syntax from PubMed for your final search (the one that yielded the 306 results in our example). Then hit the "Translate" button.



Embase handled publication date parameters differently than PubMed, so since we have that restriction in our PubMed search you will get an error. No problem: Just click on the red highlighted term and select "Remove term." Then click "Take to Advanced Search" so you can add the publication date parameter back in to your Embase search (in a new way).



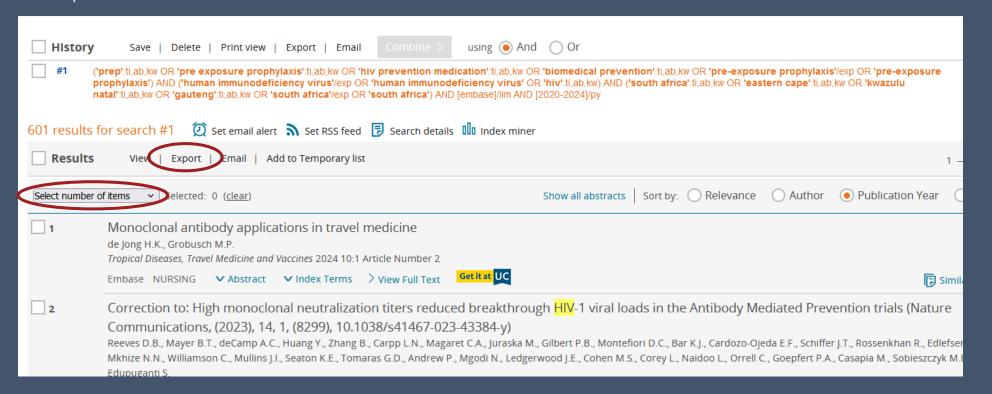
In the Advanced search window, click "Date" in the category list, and then check the box to restrict Publication Years and enter the dates that will get you close to the PubMed search.



Then click "Sources" and only check the box for "Embase." You don't want to search Preprints or MEDLINE (which all appears in PubMed) or the other options, because they will just generate duplicates - you are just adding the Embase options in this search. Then click "Search."

I device	Advanced	Advanced Drug Disease Device		Citation information		Query translator						
('H	luman immuno rica'/exp)	deficiency v	virus'/exp OR '	hiv':ti,ab,kw) /	R 'hiv prevention me AND ('south africa':ti,d ds V Quick limits V	ab,kw OR '	eastern cape':t	i,ab,kw OR ' <u>kwa</u>	zulu natal':ti	i,ab,kw Ol	R ' <mark>gauteng</mark> ':ti,ab,kw (	

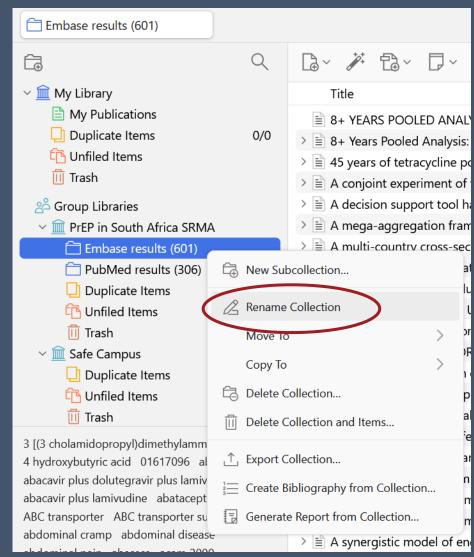
You will get 601 results. Change the select number of terms to the maximum amount (in this case 601 will be a choice) and then click "Export." Follow the steps to download the .RIS file to your computer.



#### **ZOTERO - ORGANIZING YOUR**

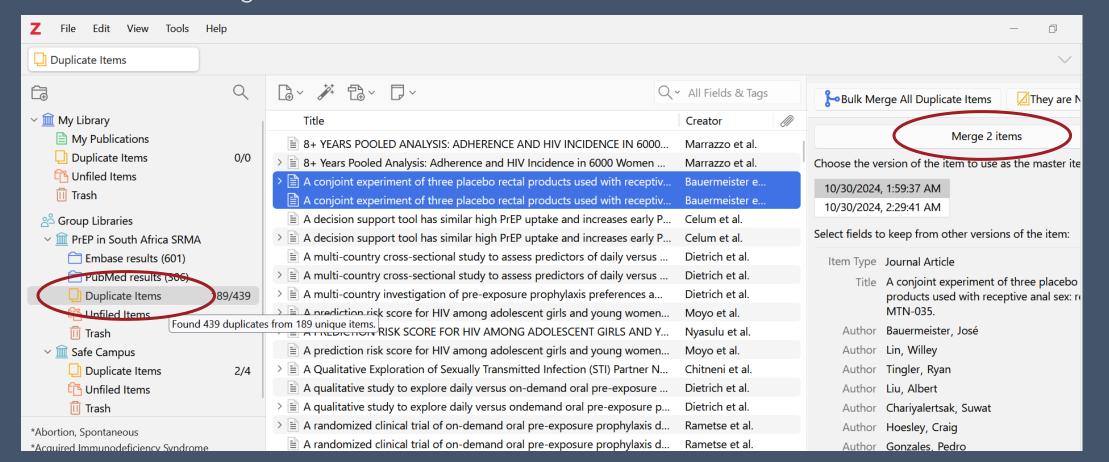
#### REFERENCES

- 1. Repeat the steps you used before for PubMed to import the new file you just exported from Embase.
- 2. Name it "Embase Results (#)" for example, in this case it is going to be Embase Results (601).



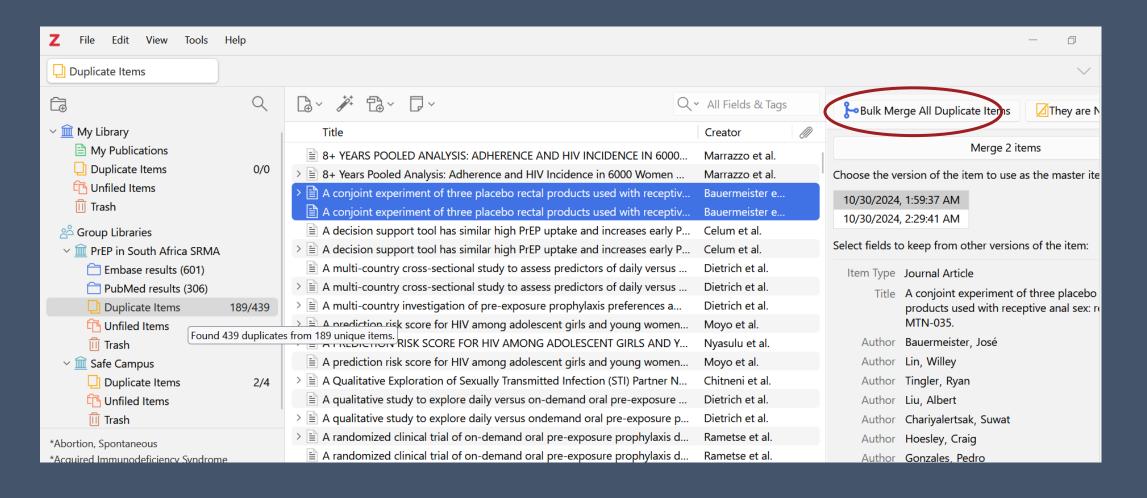
#### **ZOTERO - REMOVING DUPLICATES**

Next you need to remove duplicates. You can do this one-by-one by clicking on "Duplicate items" in the sidebar, and then clicking on a pair of duplicated records in the list and clicking the button for "Merge 2 items."



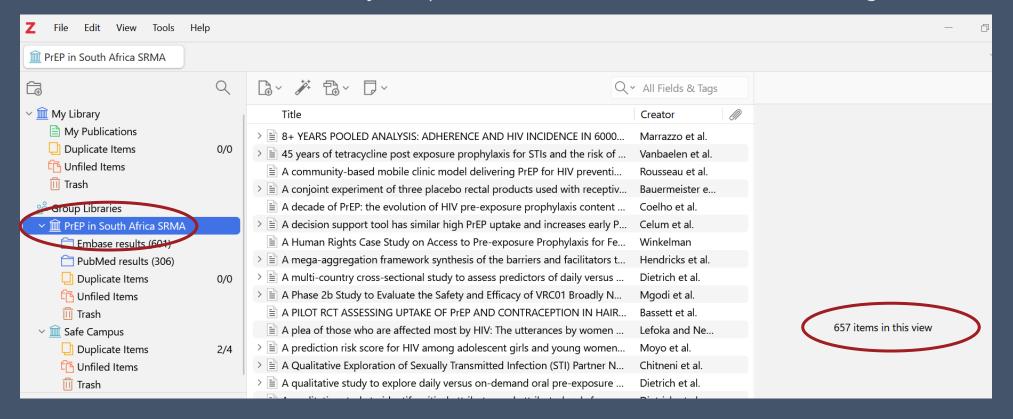
#### **ZOTERO - REMOVING DUPLICATES**

Or, if you want to install a plugin like **Zoplicate**, you can remove duplicates in bulk.



### ZOTERO - PREPARING FOR SCREENING

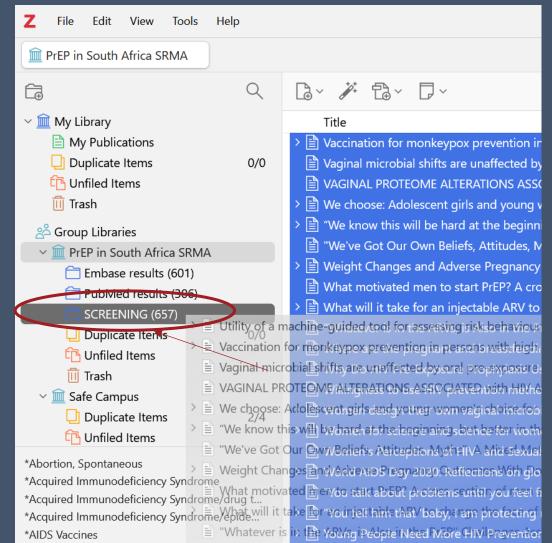
Once you have removed all the duplicates, you can click on the mail group library for your systematic review, and see how many unique records there are (also needed for Figure 1).



### ZOTERO - PREPARING FOR SCREENING Z File Edit View Tools Help PREP in South Africa SPMA

Now create a new collection that is called "SCREENING (#)" and then select all the records in the main library (the combined number of unique records from your search) and copy them to the SCREENING folder by dragging them there.

This is the set of records for which you will export Title & Abstract and screen for your systematic review!

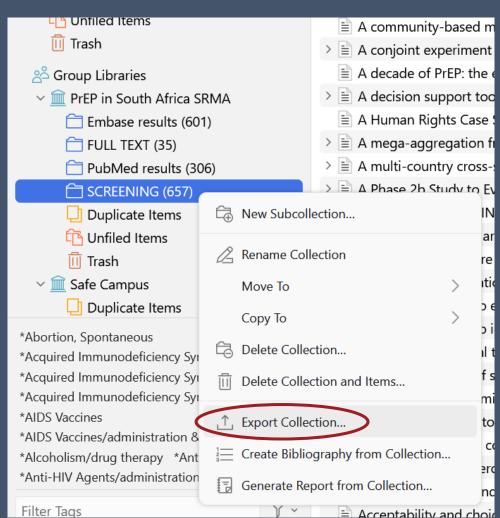


### HOW TO EXPORT TITLES/ABSTRACTS FOR SCREENING LE Unfiled Items A community-bas

Zotero makes it easy for you to export the Titles, Abstracts, and other relevant details you need for your first (and full text) round of screening!

Just right click on the collection called "SCREENING (#)" and select "Export Collection" from the menu.

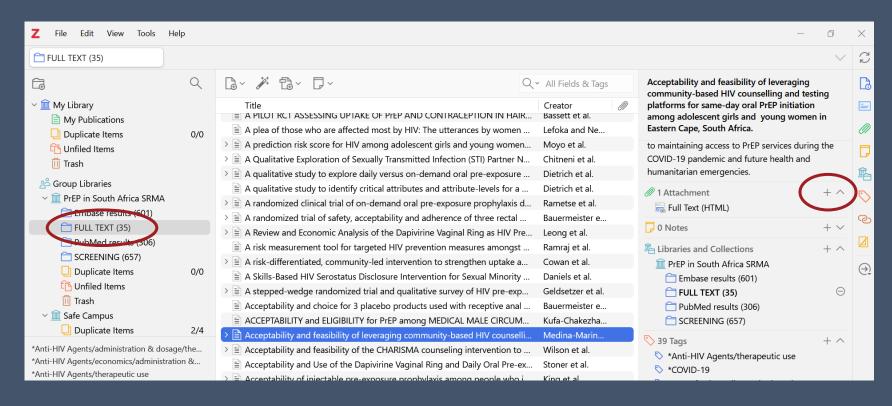
Select .csv as the format, and save the file where you like. Then you can either turn that csv file into your screening tool (which you probably want to save as an Excel file) or you can cut and paste the content into your existing screening tool in bulk.



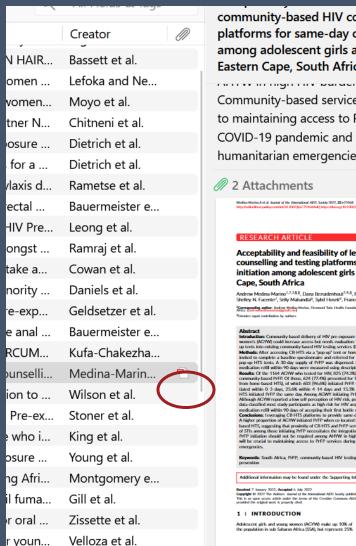
#### PREPARING TO SCREEN FULL TEXT

Once you have finished screening via Title/Abstract and are ready to move on to screening with the full text, you should create another collection called "Full Text (#)" and drag (copy) the records from the screening folder to the full text folder, if they will move to the next round. Then you can add the PDF of the full text to the records in that collection, if you want - if you do, those full text PDFs will be available to all the people in your SR team who are part of your

group library. You do this by selecting the record and scrolling down in the right sidebar to the section called "Attachments" and clicking the plus sign, then selecting the PDF file from your computer.



#### PREPARING TO SCREEN FULL TEXT



community-based HIV counselling and testing platforms for same-day oral PrEP initiation among adolescent girls and young women in Eastern Cape, South Africa.

ALTER IN HIGH FIRE DURGET COMMUNICO.

Community-based service delivery will be crucial to maintaining access to PrEP services during the COVID-19 pandemic and future health and humanitarian emergencies.

IAS

Acceptability and feasibility of leveraging community-based HIV counselling and testing platforms for same-day oral PrEP initiation among adolescent girls and young women in Eastern

Andrew Medina-Marino<sup>1,2,3,8,11</sup>, Dana Bezuidenhout<sup>2,4,11</sup>, Phuti Ngwepe<sup>2,5</sup>, Charl Bezuidenhout<sup>2,6</sup>, Shelley N. Facente<sup>4</sup>, Selly Mabandia<sup>9</sup>, Sybil Hosek<sup>9</sup>, Francesca Little<sup>4</sup>, Connie L. Celum<sup>10</sup> and Linda-Gail Bekke

Abstract.

Betrokedisc Community based delivery of HM pre-opositiv prophetols (PFF) to South African addiscoret girls and years, women's (ACVM) could increase access but needs coulatation. We integrated FMFP services via tome based services and popular to the state of the South Sou

Residual of the West POWER were resident to stage, that the contract contract is a second of the Contract of t HTS initiated PrEP the same day. Among AGWY initiating PrEP, 37.5% had a detectable sexually transmitted infection (STI)
Although AGYW reported a low-self-perception of HIV risk, post hoc application of HIV risk assessment measures to available detailed in the second of the

A registry assignation for a possibility of CH HTM and the December of the Line and the Line and

words: South Africa; PrFP; community-based HIV testing; adolescent girls and young women; differences

of new HIV infections in the region [1]. In South Africa, the HIV incidence rate among AGYW is four times higher than adolescent boys and young men (ABYM, 2.54% per year vs.

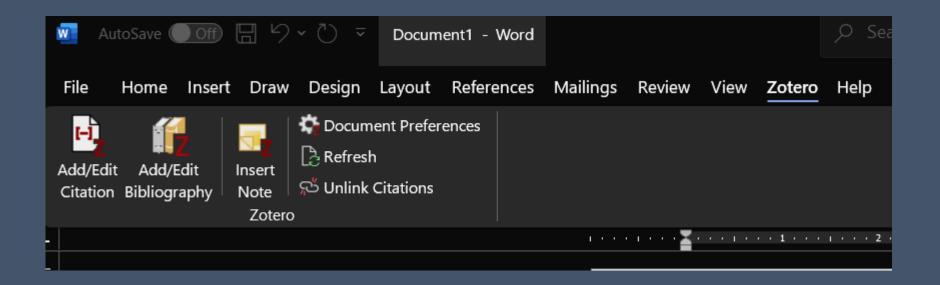
After you have added the full text, you will know it worked because the little PDF icon will appear in the record in the list.

You will also be able to see the PDF thumbnail in the sidebar, and if you double click it, it will open the PDF in a new tab so it is easy to read (such as for full-text screening, or data extraction).

Once you are done with your full-text screening, create a final collection called INCLUDED (#) and that will be the final set of articles included in your systematic review! All organized for easy reference.

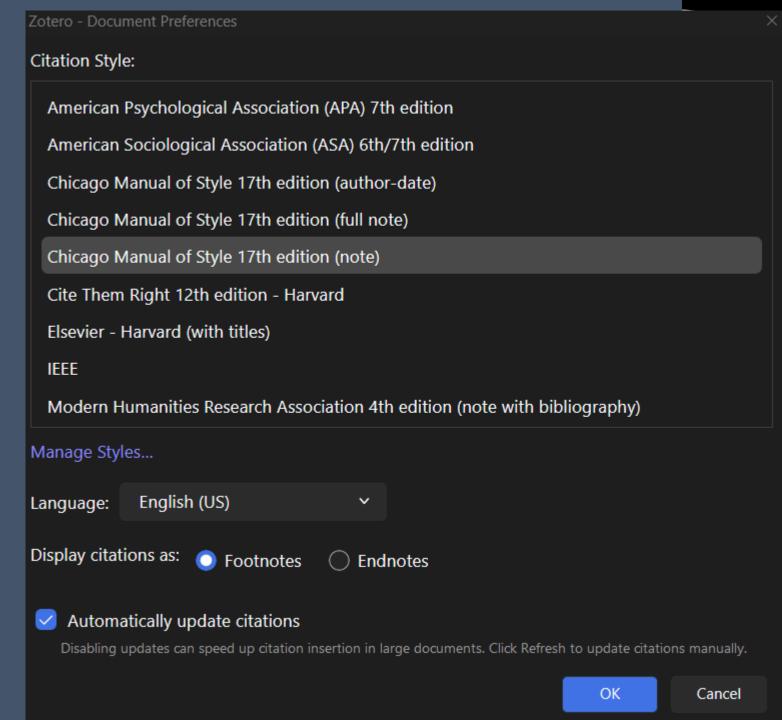
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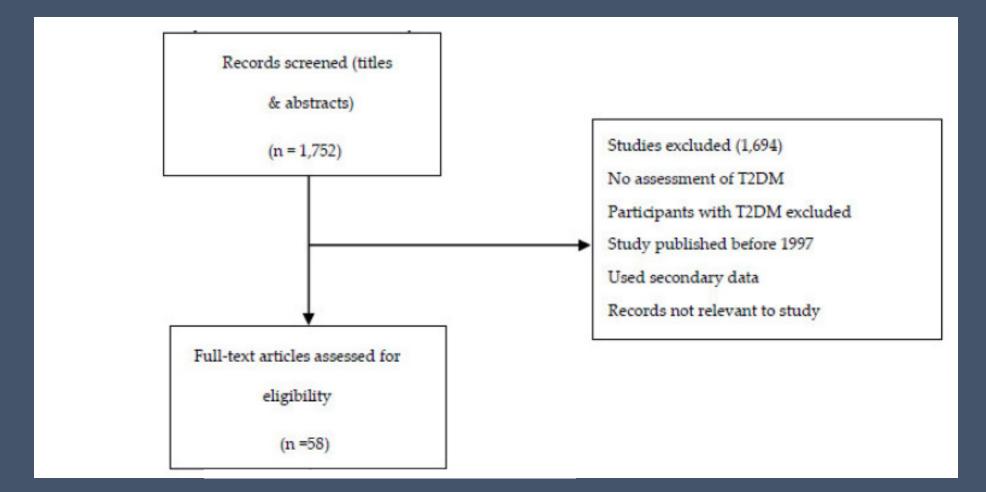
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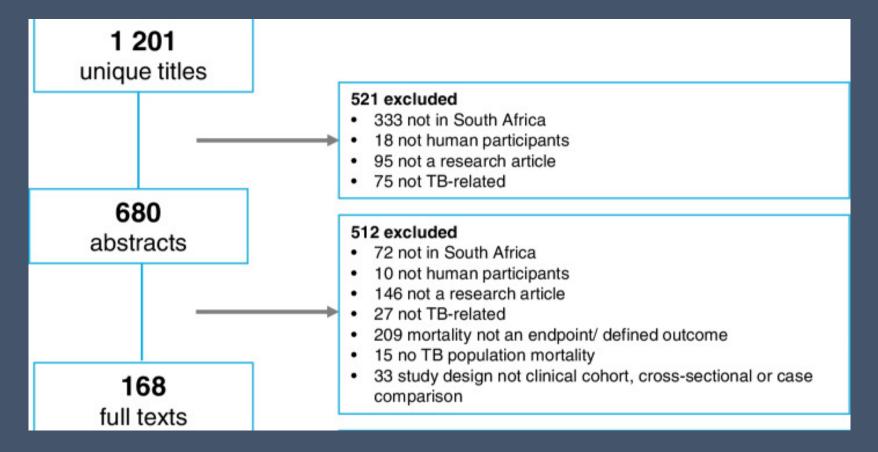


#### SCREENING RECORDS

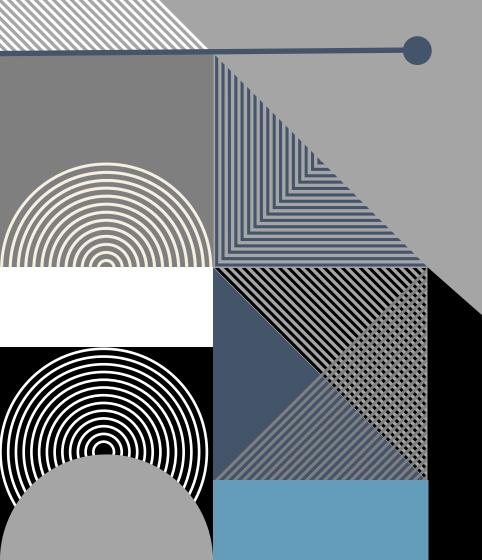
https://pubmed.ncbi.nlm.nih.gov/34070714/



#### SCREENING RECORDS



#### SCREENING STUDIES PRACTICE



Read the titles and abstracts of the studies in the worksheet on the course website.

Use the screening questions to determine if a study is clearly irrelevant.

Decide if the should the study be dropped (and why) or if the study should be kept (as it either clearly does or might meet criteria).