

## Classifiers in EPPI Reviewer

### Background

**Classifiers** organise references, sorting them by the probability that they are relevant or not, according to existing data (i.e. an existing set of items already screened and thus coded with include or exclude codes).

Each item will be given a “probability of being relevant” score and can be presented in order - sorted on this score or banded into decile bands of probability (0-9% likely to be relevant, 1-10% likely to be relevant, through to 90-99% likely to be relevant).



If you have a dataset (references and coding, or references in batches according to your inclusion / relevant and exclusion / irrelevant criteria), you can create classifiers based on this information.

(This can be screening or coding done on items already in an existing review, whereby data from EPPI Reviewer’s screening system can thus be taken to build a classifier. You can amalgamate multiple exclusion or inclusion criteria to create two codes summarising whether an item is relevant or not.

Alternatively it can be done by giving codes to subsets of your dataset, according to whether the items are relevant or irrelevant, thus you can also work with data imported from outside EPPI Reviewer i.e. without screening or coding the items within ER.)

You can then apply the classifier to new items, automatically classifying them according to knowledge the system has learnt from your existing screening / coding.

There are also several pre-built classifiers available in EPPI Reviewer, designed to find, for example, Cochrane RCTs, original RCTs, or economic evaluations.

So, the models can classify items according to the probability they are an original Random Controlled Trial, a Systematic Review, etc.

The models are built from thousands of records and should be very accurate when used on items in the same subject area i.e. biomedical records of human studies, such as RCT records found on PubMed.

(Note that we are continually expanding and improving these in-built classifiers; for example, we have recently included specific models relating to Covid and Long Covid. We have incorporated current methods such as BERT models (Bidirectional Encoder Representations from Transformers), utilising a machine-learning technique developed for natural language processing by Google.)

The screenshot shows the 'Search & Classify' tab in the EPPI Reviewer software. At the top, there are navigation links: 'Review home', 'References', 'Reports', 'Search & Classify' (active), and 'Collaborate'. Below these are several buttons: 'New Search', 'Refresh List', 'Delete Selected', 'Combine', 'Build Model', and 'Classify' (which is circled in red). The main area is divided into two steps:

**Step 1: Select a Model**

Long COVID binary model
COVID-19 map categories
<b>Cochrane RCT</b>
Economic Evaluation
Systematic Review
Original RCT
Show Custom Models per the current review
Show Custom Models for all reviews

**Step 2: Choose method to apply**

- ☒ Apply to all items in review
- ☐ Apply to items with this code
- ☐ Apply to items from this source

At the bottom, there is a green 'Run Model' button.

## Using an in-built classifier

Under the **Search & Classify** tab, click the **Classify** button (1).

Select the in-built model you wish to use (2), then which items you wish to apply the classifier to (3).

Finally click the **Run Model** button (4).

The screenshot shows the 'Search & Classify' tab in a software interface. At the top, there are navigation tabs: 'Review home', 'References', 'Reports', 'Search & Classify' (which is active and underlined), and 'Collaborate'. Below these are several buttons: 'New Search', 'Refresh List', 'Delete Selected', 'Combine' (with a dropdown arrow), 'Build Model', and 'Classify' (which is circled in red and labeled with a red '1').

The main area is divided into two columns. The left column is titled 'Step 1: Select a Model' and contains a list of model options: 'Long COVID binary model', 'COVID-19 map categories', 'Cochrane RCT' (which is highlighted in blue and circled in red, labeled with a red '2'), 'Economic Evaluation', 'Systematic Review', 'Original RCT', 'Show Custom Models per the current review', and 'Show Custom Models for all reviews'. The right column is titled 'Step 2: Choose method to apply' and contains three radio button options: 'Apply to all items in review' (which is selected and labeled with a red '3'), 'Apply to items with this code', and 'Apply to items from this source'.

At the bottom of the interface, there is a green button labeled 'Run Model' (labeled with a red '4') and a red 'X' icon.

You will be asked to confirm the action, as it may take several minutes to process.

The dialog box has a light blue header with the text 'Please confirm'. Below this, it asks 'Are you sure you wish to run the selected model?'. At the bottom, there are two buttons: 'Cancel' (a light gray button) and 'OK' (a red button).

You will then see a status message – “Refresh List to see results”.

A yellow status message bar with a yellow background and a black border. It contains a yellow information icon (i), the text 'Refresh List to see results', and a red 'X' icon.

Note that you can also apply the model to all items with a particular code, by selecting the relevant option, followed by the relevant codeset (in the code tree on the right).

**Step 1: Select a Model**

- Long COVID binary model
- COVID-19 map categories
- Cochrane RCT**
- Economic Evaluation
- Systematic Review
- Original RCT
- Show Custom Models per the current review
- Show Custom Models for all reviews

**Step 2: Choose method to apply**

- ☐ Apply to all items in review
- ☒ Apply to items with this code **3a**
- ☐ Apply to items from this source

**Current code: All items for HSRs** **3b**

**Run Model**

**Right Sidebar:**

- SIGN Information Scientist Sift
- SIGN Methodology Checklist 1: Systematic Reviews and Meta-analyses
- Allocations
  - Group 1
  - Group 2
  - All items for HSRs** **3b**
- SIGN HSR Screen on Title & Abstract

Alternatively, you can apply the model to all items from a particular source (just select the relevant source from the drop-down list).

**Step 1: Select a Model**

- Long COVID binary model
- COVID-19 map categories
- Cochrane RCT**
- Economic Evaluation
- Systematic Review
- Original RCT
- Show Custom Models per the current review
- Show Custom Models for all reviews

**Step 2: Choose method to apply**

- ☐ Apply to all items in review
- ☐ Apply to items with this code
- ☒ Apply to items from this source **3a**

**3b**

- EmBase RCTs December 2021.txt
- Cochrane trials december 2021.txt
- EmBase RCTs December 2021.txt**
- Medline RCTs December 2021.txt
- Manually Created Source

**Run Model**

Once the system has processed your reference (applied the model to your items and classified them accordingly), the results will be shown under your **Search & Classify** tab, along with your searches.

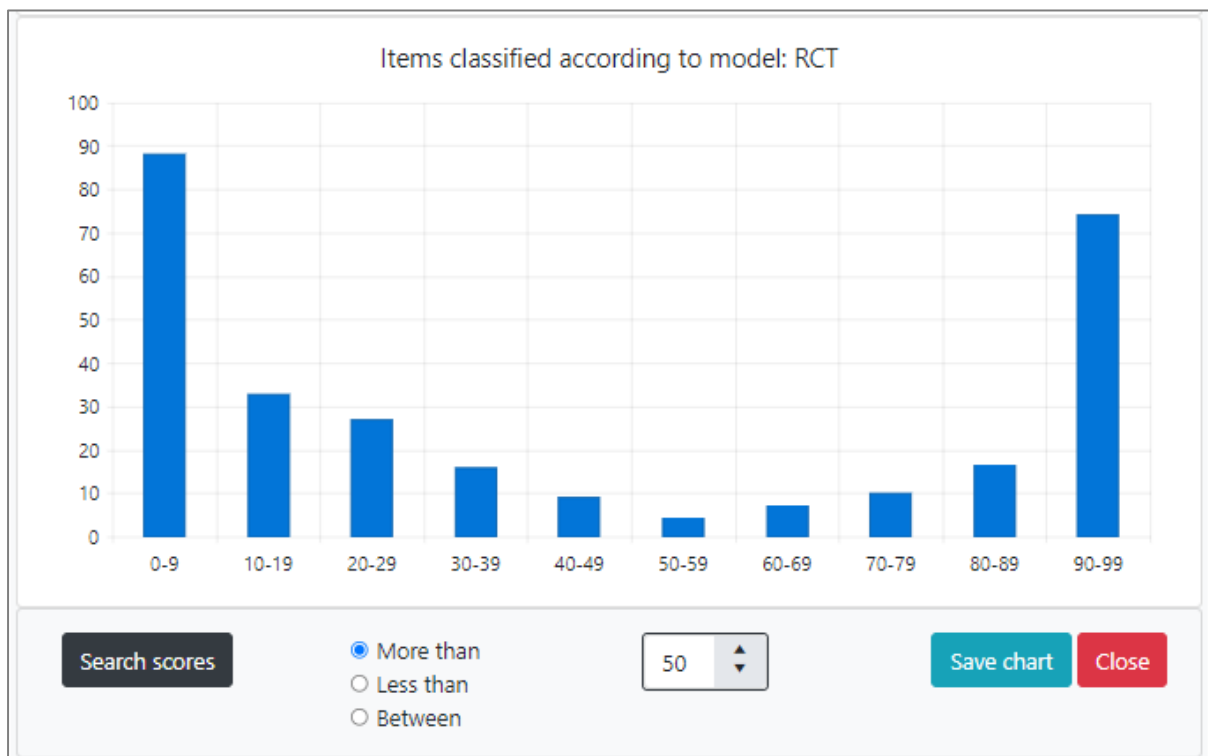
As mentioned, this can take several minutes. You may need to click the **Refresh List** button to see the classifier appear in your list.

Classifiers are indicated by the **True** link in the right-most "**Classifier**" column. To show a visualisation of the results, click the **true** link to the right of the name (in the **Classifier** column).

<a href="#">Review home</a> <a href="#">References</a> <a href="#">Reports</a> <a href="#">Search &amp; Classify</a> <a href="#">Collaborate</a>						
<a href="#">New Search</a> <a href="#">Refresh List</a> <a href="#">Delete Selected</a> <a href="#">Combine</a> <a href="#">Build Model</a> <a href="#">Classify</a>						
	No...	Name	Created By	Date	Hits	Classifier
<input type="checkbox"/>	14	<u>Items classified according to model: RCT</u>	Zak Ghouze	4 May 2022	41552	<a href="#">true</a>
<input type="checkbox"/>	13	With at least one document uploaded.	Zak Ghouze	31 Aug 2021	1	false
<input type="checkbox"/>	12	"role" (in Abstract)	Zak Ghouze	12 Apr 2021	4275	false

The results are shown in probability bands (10 bands according to how likely an item is likely to be relevant or irrelevant, from 0-9% to 90-99%).

Note that you can search for particular score ranges or save the visualisation as a graphic (for reuse elsewhere).



You can display the probability score on the **References** tab. To show a list of the items in the classifier, click on the **Hits** number adjacent to the classifier Name.

Review home References Frequencies Crosstabs Search & Classify Collaborate						
New Search Refresh List Delete Selected Combine Build Model Classify						
No...	Name	Created By	Date	Hits	Classifier	
<input type="checkbox"/> 381	Search #377 scores between 40 and 49	Mark Engelbert		32377	false	
<input type="checkbox"/> 380	Search #377 scores between 50 and 59	Mark Engelbert		18616	false	
<input type="checkbox"/> 379	Search #377 scores between 60 and 69	Mark Engelbert		4405	false	
<input type="checkbox"/> 378	Search #377 scores between 70 and 79	Mark Engelbert		170	false	
<input type="checkbox"/> 377	Items classified according to model: 2017 T-A data (pub year 2017 only)	Mark Engelbert		66309	true	
<input type="checkbox"/> 376	Not coded with: All screened (previous projects) 2021-03-31	Mark Engelbert		66317	false	
<input type="checkbox"/> 375	Not coded with: All screened (previous projects) 2021-03-31	Zafeer Ravat		66356	false	
<input type="checkbox"/> 374	Not coded with: All screened (previous projects) 2021-03-31	Zafeer Ravat		66361	false	
<input type="checkbox"/> 372	Not coded with: All screened (previous projects) 2021-03-31 (TO RE-RUN)	Zafeer Ravat		66398	false	

Alter the **View Options** to show **Score**, then you can sort by score (from lowest to highest or vice versa with each click).

Review home References Frequencies Crosstabs Search & Classify Collaborate						
Import Items Cluster Coding Report In/Exclude Export to RIS Run Reports						
First	Previous	Page: 1 of 664	Next	Last	Showing 100 items of 66309	View Options/Close Options
<div> <div> <b>List Options:</b> <input checked="" type="checkbox"/> Document ID           <input checked="" type="checkbox"/> Short title           <input checked="" type="checkbox"/> Title           <input type="checkbox"/> Journal           <input type="checkbox"/> Info           <input checked="" type="checkbox"/> Enhanced Table Selection?         </div> <div>           Page size: 100           <input type="checkbox"/> Your document ID           <input type="checkbox"/> Authors           <input checked="" type="checkbox"/> Year           <input type="checkbox"/> Document type           <input checked="" type="checkbox"/> Score         </div> </div>						
Showing Items classified according to model: 2017 T-A data (pub year 2017 only)						
<input type="checkbox"/>	ID	Short title	Title	Year	Score	
<input checked="" type="checkbox"/>	56191257	Amstutz (2020)	Home-based oral self-testing for absent and declining individuals during a door-to-door HIV testing campaign in rural Lesotho (HOSENG): a cluster-randomised trial	2020	71	
<input checked="" type="checkbox"/>	56137425	Antwi (2020)	Primary school-based nutrition education intervention on nutrition knowledge, attitude and practices among school-age children in Ghana	2020	72	

First	Previous	Page: 1 of 17	Next	Last	Showing 4000 items of 66309	View Options	Enhanced selection is: Off
Showing Items classified according to model: 2017 T-A data (pub year 2017 only)							
<input type="checkbox"/>	ID	Short title	Title	Year	Score		
<input checked="" type="checkbox"/>	56148203	Jain (2018)	Three Essays on Health and Aging	2018	60		
<input checked="" type="checkbox"/>	56193340	Jahan (2020)	Awareness Development and Usage of Mobile Health Technology Among Individuals With Hypertension in a Rural Community of Bangladesh: Randomized Controlled Trial	2020	60		



(You can alter the number of items shown per page via the **View Options** link. A list of items can be selected in one operation via the checkbox at the top of the list.)

Review home | References | Reports | Search & Classify | Collaborate

Import Items | Cluster | Coding Report | In/Exclude | Export to RIS | Run Reports

First | Previous | Page: 1 of 142 | Next | Last | Showing 100 items of 14103 | [View Options / Close Options](#) | Enhanced selection is: Off

**List Options:**

- ☒ Document ID
- ☒ Short title
- ☒ Title
- ☐ Journal
- ☒ Info
- ☐ Enhanced Table Selection? ?
- ☐ Your document ID
- ☐ Authors
- ☒ Year
- ☐ Document type
- ☐ Score

Page size: 4000 | **Apply Change**

Review home | References | Reports | Search & Classify | Collaborate

Import Items | Cluster | Coding Report | In/Exclude | Export to RIS | Run Reports

First | Previous | Page: 1 of 20 | Next | Last | Showing 4000 items of 77102 | [View Options](#) | Enhanced selection is: Off

Showing Items classified according to model: RCT

ID	Short title†	Title	Year	Info	Score
61387832	"Prospective, Randomized,... (Sungurtekin)	"Prospective, Randomized, Controlled Trial of Ultra-modified Internal Sphincterotomy vs Closed Lateral Internal Sphincterotomy for Chronic Fissure-in-Ano"			99
61427941	[A randomized study... (Hashimura)	[A randomized study of prophylactic intravesical instillation of pirarubicin (THP) prior to transurethral resection of superficial bladder cancer]			99

(You can also “filter” on score in ER 4, if you enable the column in your view options, so can get a specific subset of items by score from your classifier.)

Documents | Search | Diagrams | Frequencies | Crosstabs | Reports | Meta-analysis | Collaborate | My info

700 documents loaded (out of 66309 in this list in total).  
Showing: Items classified according to model: 2017 T-A data (pub year 2017 only)

Filter: [ ]

Authors	Title	Year	Score
Homsy Jacob ; Kir	Primary HIV prevention in pregnant and lactating Ugandan women: A randomized trial	2019	79
Samburu Betty ;	Effectiveness of the baby-friendly community initiative in promoting exclusive breastfeeding amon	2020	76
Nguyen B T ; Sas	The effect of universal health insurance for children in Vietnam	2019	76
Sharma V ; Leig	Effectiveness of a culturally appropriate intervention to prevent intimate partner violence and HIV	2020	75
Nwaazuru Ucheo	By her own hands: Combination income-generating HIV prevention intervention to promote HIV r	2021	75
Heath R ; Hidro	Cash transfers, polygamy, and intimate partner violence: experimental evidence from Mali	2020	75
Heath Rachel ; H	Cash transfers, polygamy, and intimate partner violence: Experimental evidence from Mali	2018	75
Effendy Devi Sav	Nutrition education in Southeast Sulawesi Province, Indonesia: A cluster randomized controlled st	2020	75
Myer Landon ; Pl	Integration of postpartum healthcare services for HIV-infected women and their infants in South	2018	74
Maman Suzanne	Results from a cluster-randomized trial to evaluate a microfinance and peer health leadership inte	2020	74
Maldonado L Y ; E	Improving maternal, newborn and child health outcomes through a community-based women's h	2020	74
de Hoop Jacobus	Women's Economic Capacity and Children's Human Capital Accumulation	2017	74
Blakstad M M ; M	Home gardening improves dietary diversity, a cluster-randomized controlled trial among Tanzania	2020	74
Settergren Susa	Cluster randomized trial of comprehensive gender-based violence programming delivered throug	2018	73
Saleem Naem ;	Do conditional cash transfers help to improve the access of maternal health care services in provi	2019	73
Ogum Alangea ;	Evaluation of the rural response system intervention to prevent violence against women: findings	2020	73

Filter: [ ]

Select All

- 66
- 67
- 68
- 69
- 70
- 71
- 72
- 73
- 74
- 75
- 76

Show rows with value that

Is equal to

And

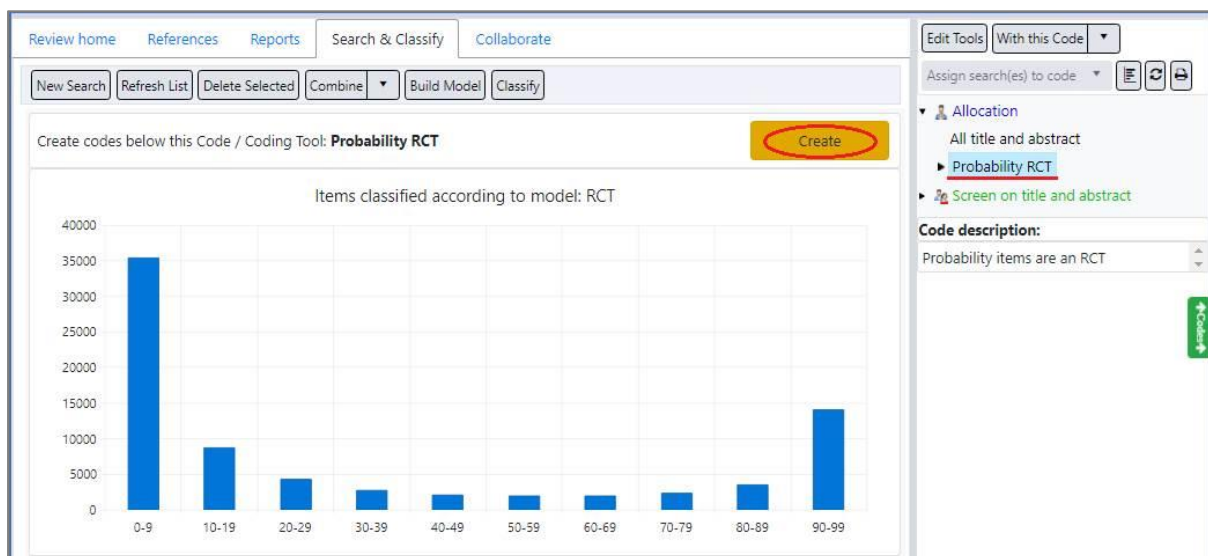
Is equal to

Filter | Clear Filter

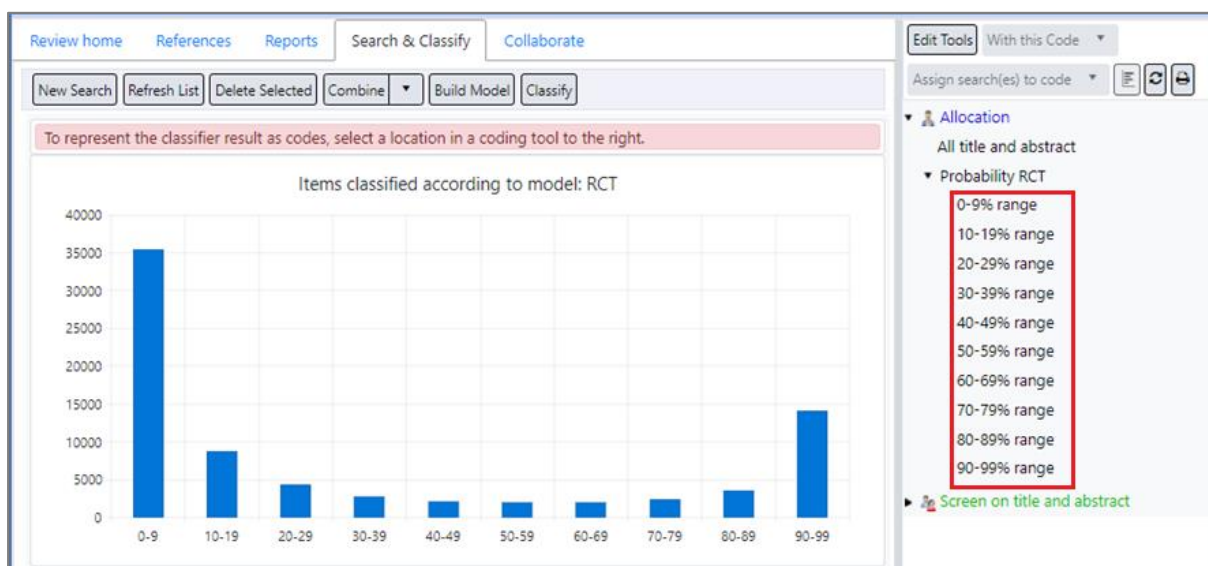
Status: Normal. Last code update: 24/03/2021 | User: Zak Ghouze | Review: REV\_ID = 26065 (SiteAdmin manual access)

You can use the decile bands EPPI Reviewer produces to automatically create 10 codes within a codeset which are assigned to each item according to their band of probable relevance, useful for creating allocation codes or focusing on specific bands. (For example, you may wish to exclude all those items in the lower few bands en masse i.e. all items unlikely to be relevant / likely to be irrelevant, or you may wish to manually screen the items around the middle bands, where the system isn't sure if they will be included or excluded, or you may wish to work with only those items the system judges likely to be relevant i.e. those in the uppermost bands.)

If you select a code in the code tree on the right, you can then get the system to automatically make 10 child codes for the 10 bands by clicking the **Create** button. (You can easily create a code specifically for this purpose.)



The child codes will be applied to your items according to which band they are in.





So, for example, you can list and operate on the items in the 90-99% band by simply listing the items with the relevant code.

Review home | References | Reports | Search & Classify | Collaborate

Import Items | Cluster | Coding Report | In/Exclude | Export to RIS | Run Reports

First | Previous | Page: 1 of 142 | Next | Last | Showing 100 items of 14103 | View Options | Enhanced selection is: On

Showing 90-99% range.

ID	Short title†	Title	Year	Info
GO <input type="checkbox"/> 61387832	"Prospective, Randomized,... (Sungurtekin)	"Prospective, Randomized, Controlled Trial of Ultra-modified Internal Sphincterotomy vs Closed Lateral Internal Sphincterotomy for Chronic Fissure-in-Ano"		
GO <input type="checkbox"/> 61427941	[A randomized study... (Hashimura)	[A randomized study of prophylactic intravesical instillation of pirarubicin (THP) prior to transurethral resection of superficial bladder cancer]		
GO <input type="checkbox"/> 61350240	[Application of Alpha1-adrenergic... (Wang)	[Application of Alpha1-adrenergic antagonist with extracorporeal shock wave lithotripsy for lower ureteral stone]		
GO <input type="checkbox"/> 61383198	[Approach to percutaneous... (Sedano-Portillo)	[Approach to percutaneous nephrolithotomy. Comparison of the procedure in a one-shot versus the sequential with metal dilata]		

Edit Tools | With this Code

Assign Code

Allocation

All title and abstract

Probability RCT

0-9% range

10-19% range

20-29% range

30-39% range

40-49% range

50-59% range

60-69% range

70-79% range

80-89% range

90-99% range

Screen on title and abstract

Code description:

FROM: Items classified according to model: RCT

(You can see the items' coding via a **Frequency Chart**. Clicking on the numbers brings up a list of those items.)

Review home | References | Reports | Search & Classify | Collaborate

Frequencies and crosstabs | Configurable reports | Run Reports

Rows: Probability RCT | Set | Get Frequencies

Columns: Not set (only used for Crosstabs) | Set

Filter: Not set (optional) | Set Filter | Clear Filter

Get Frequencies | Get CrossTab | Included | Excluded | Both | Current code: Probability RCT

Show results as: Table | Pie chart | Bar chart | Show 'None of the codes above' | Export

Code	Count
0-9% range	35319
10-19% range	8769
20-29% range	4268
30-39% range	2704
40-49% range	2098
50-59% range	1966

Edit Tools | With this Code

Allocation

All title and abstract

Probability RCT

Screen on title and abstract

Code description:

Probability items are an RCT

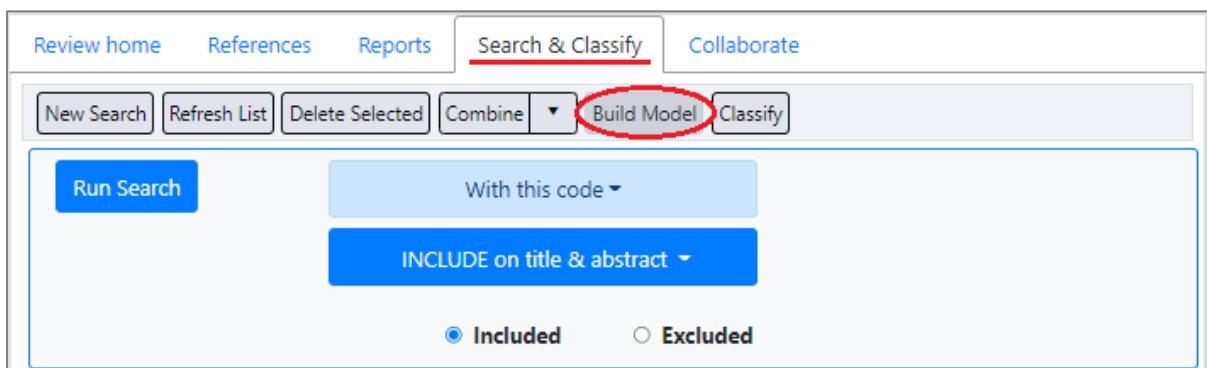
## Creating Custom Classifiers

Further to the built-in classifiers described above, you can also create your own classifiers based on existing data.

You may have a batch of coded or screened items in the review that you want to use as the basis for a model. You may have sets of references elsewhere that you wish to import, coding each batch with an appropriate code for the model to work with. (You could also, for example, take references from another review, or combine your existing priority screening coding into two codes (*relevant* for items with an include code and *irrelevant* for items with an exclude code) and use that as the basis for a model.)

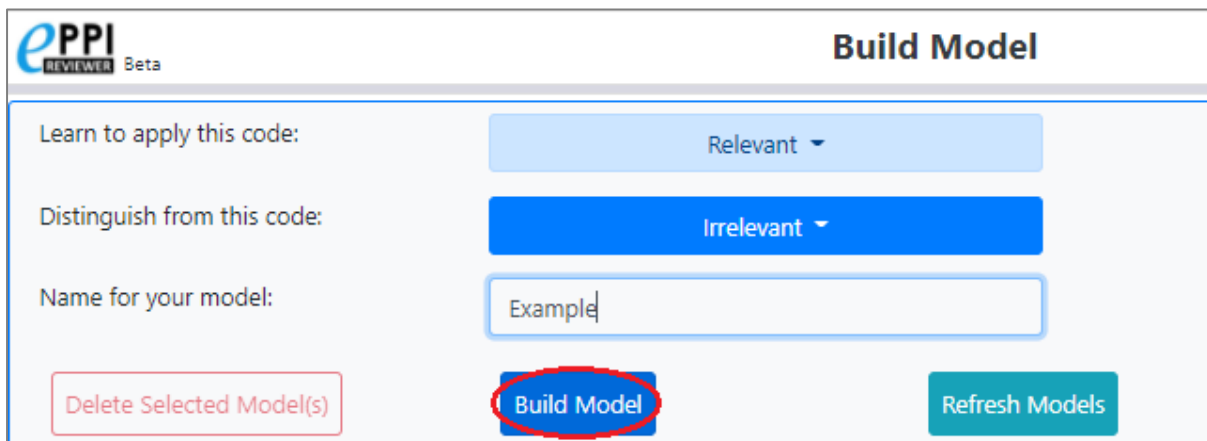
Your model will learn to classify items according to whether they are relevant or irrelevant, based on the dataset (refs and coding) you base the model on.

To create a new model, click the **Build Model** button (still under the **Search & Classify** tab).



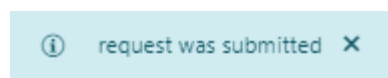
The screenshot shows the 'Search & Classify' tab selected in the top navigation bar. Below the navigation bar, there is a row of buttons: 'New Search', 'Refresh List', 'Delete Selected', 'Combine', 'Build Model' (circled in red), and 'Classify'. Below this row, there is a section with a 'Run Search' button, a 'With this code' dropdown, an 'INCLUDE on title & abstract' button, and radio buttons for 'Included' (selected) and 'Excluded'.

Next, select the 2 codes which define the items which are relevant and those that are irrelevant. Give the model a name and click the next **Build Model** button.



The screenshot shows the 'Build Model' form. It has a header with the 'ePPI REVIEWER Beta' logo and the title 'Build Model'. The form contains three rows of input fields: 'Learn to apply this code:' with a 'Relevant' dropdown, 'Distinguish from this code:' with an 'Irrelevant' dropdown, and 'Name for your model:' with a text box containing 'Example'. At the bottom, there are three buttons: 'Delete Selected Model(s)' (outlined in red), 'Build Model' (circled in red), and 'Refresh Models'.

As the process takes some time, you will see a confirmation that your request was submitted.



The system will work through the data and build its model. Whilst it is processing, you can use other functions within the software.

(If you wish to check if the model has been built, you can click the **Refresh Models** button. Whilst it is still building, the entry in the list of models will show “in progress” and the associated figures will all show as zero.)

Learn to apply this code: Relevant ▾  
Distinguish from this code: Irrelevant ▾  
Name for your model:   
Delete Selected Model(s) Build Model Refresh Models

<input type="checkbox"/>	ReviewId	Title	Att On	Att Not On	Accuracy	AUC	Precision	Recall
<input type="checkbox"/>	25830	Example (in progress...)	Relevant	Irrelevant	0	0	0	0

When the processing has completed, you will see the model listed with associated figures. (These figures are detailed later in this document.)

<input type="checkbox"/>	ReviewId	Title	Att On	Att Not On	Accuracy	AUC	Precision	Recall
<input type="checkbox"/>	25830	Example	Relevant	Irrelevant	0.907	0.94	0.306	0.807

## Applying Custom Classifiers

To apply your newly built classifier, click the **Classify** button in the normal way.

Review home   References   Reports   Search & Classify   Collaborate

New Search   Refresh List   Delete Selected   Combine ▾   Build Model   Classify

Click the option to **Show Custom Models per the current review** (1) option, select the relevant model from the list below (2), then select which items are to be classified (3).

[Review home](#)
[References](#)
[Reports](#)
[Search & Classify](#)
[Collaborate](#)

[New Search](#)
[Refresh List](#)
[Delete Selected](#)
[Combine](#)
[Build Model](#)
[Classify](#)

**Step1: Select a Model**

Long COVID binary model
COVID-19 map categories
Cochrane RCT
Economic Evaluation
Systematic Review
Original RCT

1 **Show Custom Models per the current review**

Show Custom Models for all reviews

**Step 2: Choose method to apply**

3 ☒ Apply to all items in review
☐ Apply to items with this code
☐ Apply to items from this source

	ReviewID	ModelID	Title	Applies	Compar...	Precision	Recall	Rebuild
<input checked="" type="checkbox"/>	25830	2268	Example	Relevant	Irrelevant	0.306	0.807	Rebuild
<input type="checkbox"/>	25830	1202	Most used Exclude	INCLUDE on title & abstract	Most used excludes	0.256	0.636	Rebuild

You can also create models in other reviews and apply them in your current review. (You may have other data or existing models you wish to apply to items in a different project.)

#### Step1: Select a Model

Long COVID binary model
COVID-19 map categories
Cochrane RCT
Economic Evaluation
Systematic Review
Original RCT
Show Custom Models per the current review

**Show Custom Models for all reviews**

(Equally, you can apply the model (or classify) items with a particular code, or items from a particular source – as with the built-in models.)

### Step 2: Choose method to apply

- ☐ Apply to all items in review
- ☒ Apply to items with this code
- ☐ Apply to items from this source

Please select a code from the right.

When you have the parameters as you wish, click the **Run Model** button.

[Review home](#)
[References](#)
[Reports](#)
[Search & Classify](#)
[Collaborate](#)

[New Search](#)
[Refresh List](#)
[Delete Selected](#)
[Combine](#)
[Build Model](#)
[Classify](#)

#### Step 1: Select a Model

Long COVID binary model  
COVID-19 map categories  
Cochrane RCT  
Economic Evaluation  
Systematic Review  
Original RCT  
Show Custom Models per the current review  
Show Custom Models for all reviews

#### Step 2: Choose method to apply

☐ Apply to all items in review  
☒ Apply to items with this code  
☐ Apply to items from this source  
Current code: Unscreened 17-5

	ReviewID	ModelID	Title	Applies	Compared wi...	Precision	Recall	Rebuild
<input checked="" type="checkbox"/>	25830	2268	Example	Relevant	Irrelevant	0.306	0.807	<a href="#">Rebuild</a>
<input type="checkbox"/>	25830	1202	Most used Exclude	INCLUDE on title & abstract	Most used excludes	0.256	0.636	<a href="#">Rebuild</a>
<input type="checkbox"/>	25830	1195	Exclude year	INCLUDE on title & abstract	EXCLUDE - Year < 2000	0.842	0.842	<a href="#">Rebuild</a>

[Run Model](#)

You will be asked to confirm the action, as it can take some time to complete.

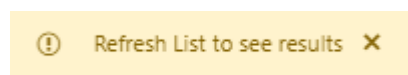
**Please confirm**

Are you sure you wish to run the selected model ?

Cancel

OK

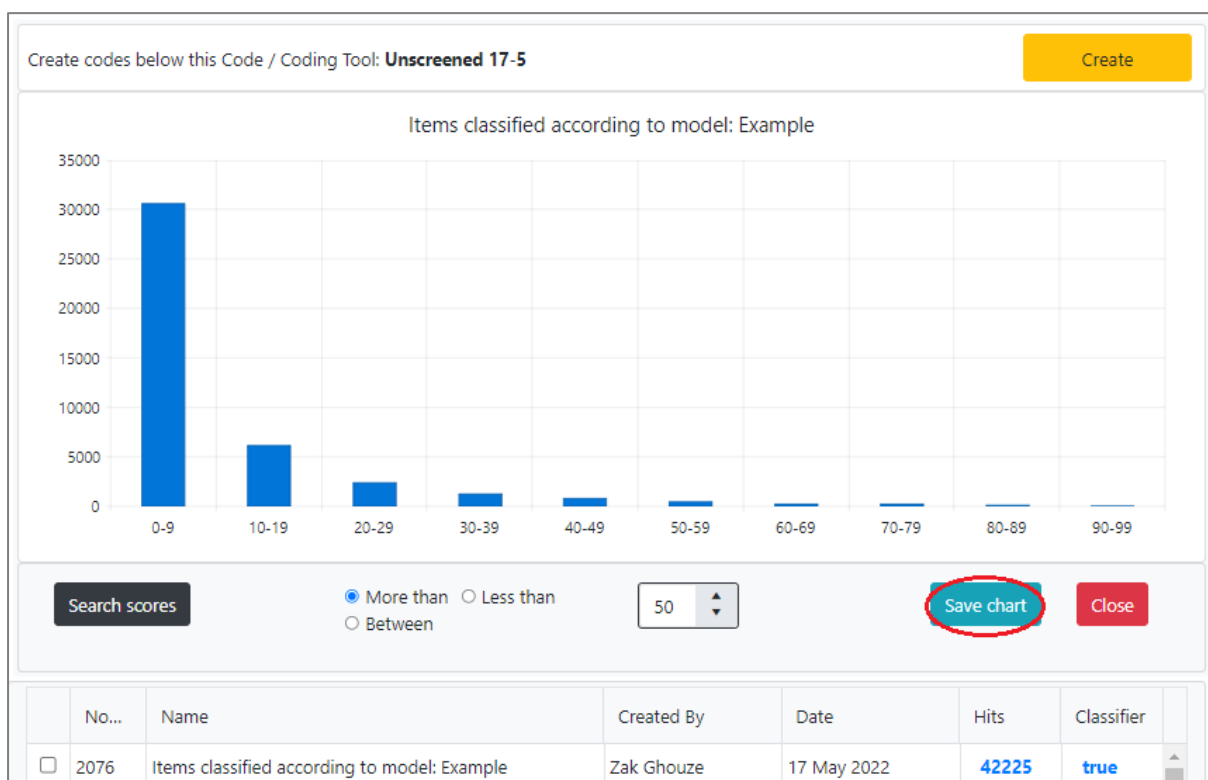
You will then see a message, suggesting you refresh the Search list to check for the results coming in. (Again, you can continue to use other functions in EPPI Reviewer whilst the system runs the model.)



When the results are ready, you will see them listed, with the line showing **true** in the “Classifier” column. Click the **true** link to visualise their distribution according to probability of being relevant.

The chart can be saved as a graphic via the **Save chart** button.

	No...	Name	Created By	Date	Hits	Classifier
<input type="checkbox"/>	2076	Items classified according to model: Example	Zak Ghouze	17 May 2022	42225	<a href="#">true</a>





You can search for certain ranges of probabilities; the results will be listed in your searches. Enter the parameters and click the **Search scores** button.

Search scores

☐ More than
 ☒ Less than
 ☐ Between

60

Save chart

Close

No...	Name	Created By	Date	Hits	Classifier
<input type="checkbox"/> 2079	<u>Search #771394 scores less than 60</u>	Zak Ghouze	17 May 2022	41675	false

You can also list the items classified in order of probable relevance by clicking on the number of **Hits**, as described for built-in classifiers earlier.

No...	Name	Created By	Date	Hits	Classifier
<input type="checkbox"/> 2076	Items classified according to model: Example	Zak Ghouze	17 May 2022	42225	true

[Review home](#)
[References](#)
[Reports](#)
[Search & Classify](#)
[Collaborate](#)

Import Items

Cluster

Coding Report

In/Exclude

Export to RIS

Run Reports

First

Previous

Page: 1 of 11

Next

Last

Showing 4000 Items of 42225

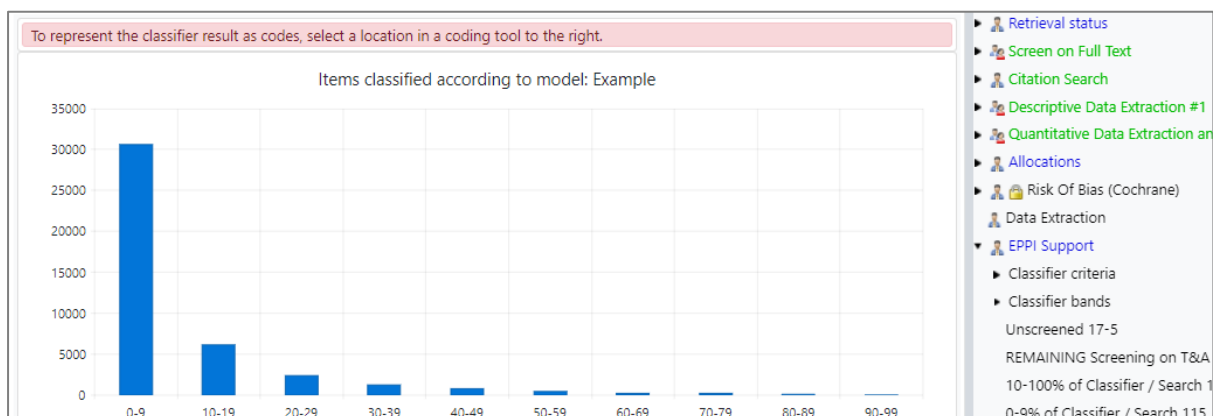
View Options

Showing Items classified according to model: Example

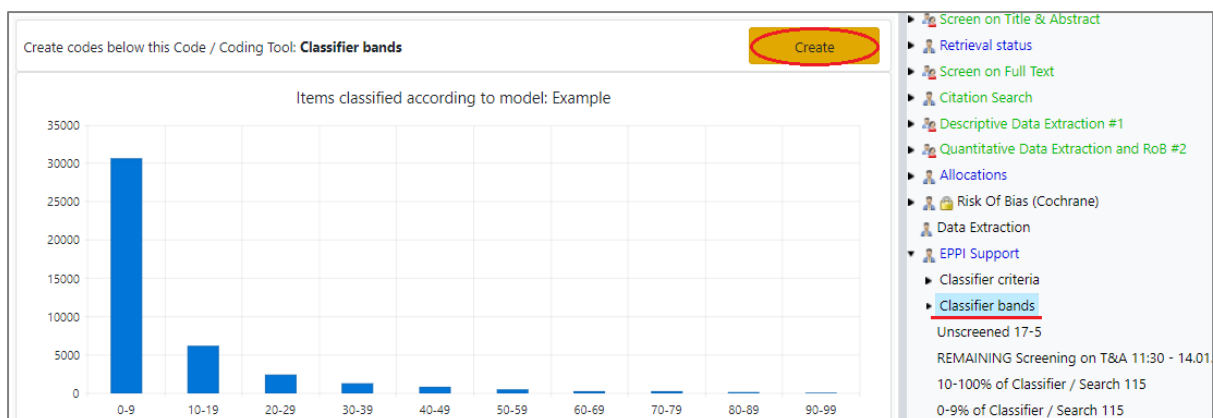
I E D

<input type="checkbox"/>	ID	Short title	Title	Year	Score!
<input checked="" type="checkbox"/>	GO	<input type="checkbox"/> I	54977122 Ban, (2020)	Self-help groups, savings and social capital: Evidence from a field experiment in Cambodia	2020 98
<input checked="" type="checkbox"/>	GO	<input type="checkbox"/> I	54834975 Adoho (2014)	The impact of an adolescent girls employment program: The EPAG project in Liberia	2014 97
<input checked="" type="checkbox"/>	GO	<input type="checkbox"/> I	54978725 Naved, (2018)	A cluster randomized controlled trial to assess the impact of SAFE on spousal violence against women and girls in slums of Dhaka, Bangladesh	2018 96
<input checked="" type="checkbox"/>	GO	<input type="checkbox"/> I	54977125 McIntosh (2012)	The CLP's impact on women's empowerment	2012 95
<input checked="" type="checkbox"/>	GO	<input type="checkbox"/> I	54977119 Muhammad, (2012)	Women empowerment and microfinance: A case study of Pakistan.	2012 95
<input checked="" type="checkbox"/>	GO	<input type="checkbox"/> I	54834794 Buehren, (2017)	Adolescent Girls' Empowerment in Conflict-Affected Settings: Experimental Evidence from South Sudan	2017 95

Finally, the system can automatically create 10 codes based on the decile bands of probability, with each item being given one of the 10 codes accordingly.



Select the parent code where you want the 10 new codes to appear, then click the **Create** button.



The codes will be created and applied as requested.

Rows: Classifier bands    Set    Get Frequencies

Columns: Not set (only used for Crosstabs)    Set

Filter: Not set (optional)    Set Filter    Clear Filter

Get Frequencies    Get CrossTab    ☐ Included    ☐ Excluded    ☒ Both    Current code: Classifier bands

Show results as: ☒ Table    ☐ Pie chart    ☐ Bar chart    ☒ Show 'None of the codes above'    Export

Code	Count
0-9% range	30576
10-19% range	6109
20-29% range	2399
30-39% range	1304
40-49% range	794
50-59% range	493
60-69% range	247
70-79% range	124
80-89% range	62
90-99% range	31

- Retrieval status
- Screen on Full Text
- Citation Search
- Descriptive Data Extraction #1
- Quantitative Data Extraction and RoB #2
- Allocations
- Risk Of Bias (Cochrane)
- Data Extraction
- EPPI Support
  - Classifier criteria
  - Classifier bands

0-9% range  
10-19% range  
20-29% range  
30-39% range  
40-49% range  
50-59% range  
60-69% range  
70-79% range  
80-89% range  
90-99% range

## The numbers

The Recall and Precision figures are built in the following way -:

- Upon receiving the training data, a proportion (10%) of randomly selected records is set aside for the purpose of calculating the “performance” figures - including precision and recall. (The algorithm will “fail” if it doesn’t receive enough records to train and then evaluate the result.)
- The remaining portion (the 90% majority of records) will then be used for training. Once the classification model is built, the initial “set aside” portion is used to evaluate performance. For this, precision and recall are calculated by setting the cut-off threshold at 0.5 (or “50%).
- (NOTE: Rebuilding models, especially when there isn’t a great deal of training data, can produce slightly different precision and recall numbers, depending on what gets randomly selected for “evaluation”).
- When you apply a model, you will hopefully find the majority of references that scored more than 50% are “true positives” i.e. have been classified correctly. You may also find a tail of true positives below the 50% score, generally accounting for a small minority of all true positives.
- Accuracy is usually calculated using precision / recall, and is produced from the same 10% records used for the other performance stats. (The specific formula used for the Accuracy score is documented here: [https://scikit-learn.org/stable/modules/model\\_evaluation.html#accuracy-score](https://scikit-learn.org/stable/modules/model_evaluation.html#accuracy-score)

$$\text{accuracy}(y, \hat{y}) = \frac{1}{n_{\text{samples}}} \sum_{i=0}^{n_{\text{samples}}-1} 1(\hat{y}_i = y_i)$$

You’ll find some background information here <https://paulvanderlaken.com/2019/08/16/roc-auc-precision-and-recall-visually-explained/> and formal definitions here [https://en.wikipedia.org/wiki/Precision\\_and\\_recall](https://en.wikipedia.org/wiki/Precision_and_recall). (Excuse the source, but it’s not a bad summary.)

We have a document on the Machine Learning available within ER Web available at [https://eppi.ioe.ac.uk/CMS/Portals/35/machine\\_learning\\_in\\_eppi-reviewer\\_v\\_7\\_web\\_version.pdf](https://eppi.ioe.ac.uk/CMS/Portals/35/machine_learning_in_eppi-reviewer_v_7_web_version.pdf).

(Other information on automation in ER can be found at <https://eppi.ioe.ac.uk/cms/Default.aspx?tabid=3772>. Other information about the software can be found at <https://eppi.ioe.ac.uk/cms/Default.aspx?tabid=3822>.