EPPI-Reviewer 4
Software for research synthesis

User Manual

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EPPI –Reviewer 4.5 User Manual

Description and background

EPPI-Reviewer 4 is a multi-user web-based application for managing and analyzing data for use in research synthesis.

System and internet requirement

The only requirement is that the computer must be able to run Silverlight 5 and be connected to the internet.

For optimum performance we would suggest:

- Computer: PC or Mac
- Silverlight 5+
- Minimum OS: Windows XP or Mac OS 10.4
- Minimum browser: Internet Explorer 8+ ; Firefox 3+; Safari (Mac only)
- Broadband internet connection: > 1Mb/sec

About the User Manual

The user manual provides instructions on how to use EPPI-Reviewer 4 and leads you through the most commonly used functions in the software.

Version: **4.5.0.0**

Last update: **September 28, 2015**.

For details of changes introduced to the manual and software please see the Forum announcements on the EPPI-Reviewer 4 gateway (http://eppi.ioe.ac.uk/cms/er4). Each time the software is updated details of the update are listed there.

Easy introduction

This is an easy introduction to EPPI-Reviewer 4. In this example you will:

1. Login and create a review
2. Import some references from PubMed.
3. Create a coding tool
4. Code some documents
5. Run a frequency report

1. Go to the login page at http://eppi.ioe.ac.uk/eppireviewer4/, enter your username and password and click **Login**. If this is the first time you have used EPPI-Reviewer 4 you may see the Create New Review window. If so, enter a name in the box and click on **New Review**. If a review is already present then you can click **Go** next to the review name.

2. You are now on the home screen. On the left is the **Home panel** and on the right is the **Toolbox panel**. Each panel has a number of tabs leading to different functions in the program.
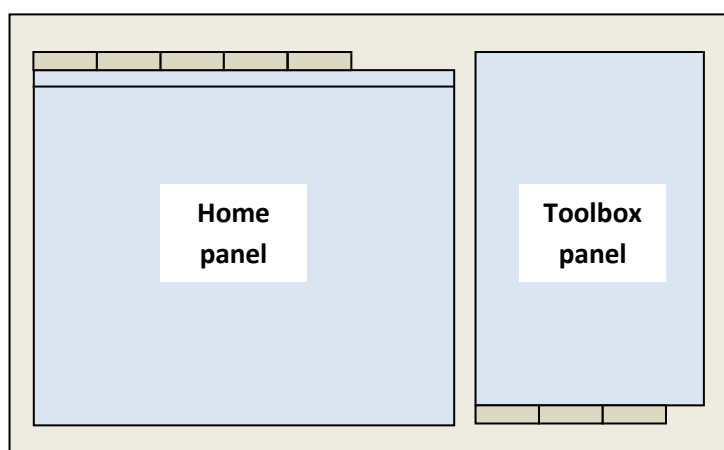
Select the **Sources** tab in the Toolbox panel and click on the button labelled **Manage Sources / Add New**. This will open the Add Source window.

 You can also reach the Add Source window by clicking on **Import references** icon at the top of the Documents tab of the Home panel
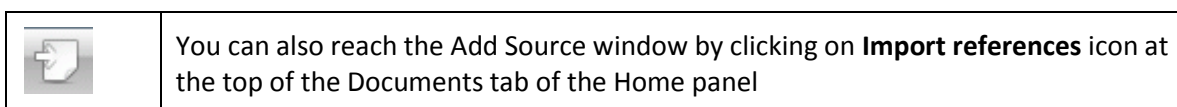
We will import some references directly from PubMed so select the **PubMed Import** tab, enter some search terms in the box next to the **Search PubMed** button and then click on the **Search PubMed** button. EPPI-Reviewer will send your search terms to PubMed and return the search results. To save the search results into EPPI-Reviewer click on the **Import** button at the bottom of the Add Source window. Once saved, close the Add Source window.

3. You should now be back at the Review home screen. To create a coding tool select the **Codes** tab in the Toolbox panel. Click on the **Create new code set** icon to create a new coding tool.

 You can create a new code set by clicking on the **Create new code set** icon at the top of the Codes tab of the Toolbox panel
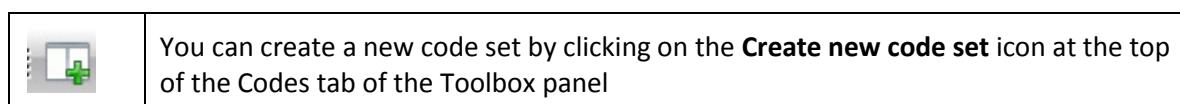
A window will appear where you should select a **CodeSet Type**. For this example select **Screening**. Next, enter a name for your codeset, such as 'Screening criteria', for the coding tool.
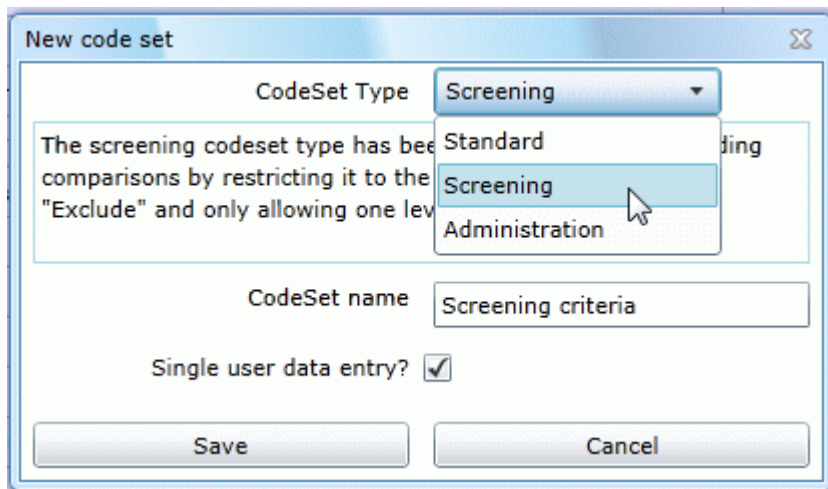
Click **Save** and the new tool will appear in the Codes tab. A code set contains a set of codes. To add codes to the code set, right click the new code and select the option **Add child code** to add a code to the code set. This will open the **Add / edit code** window.
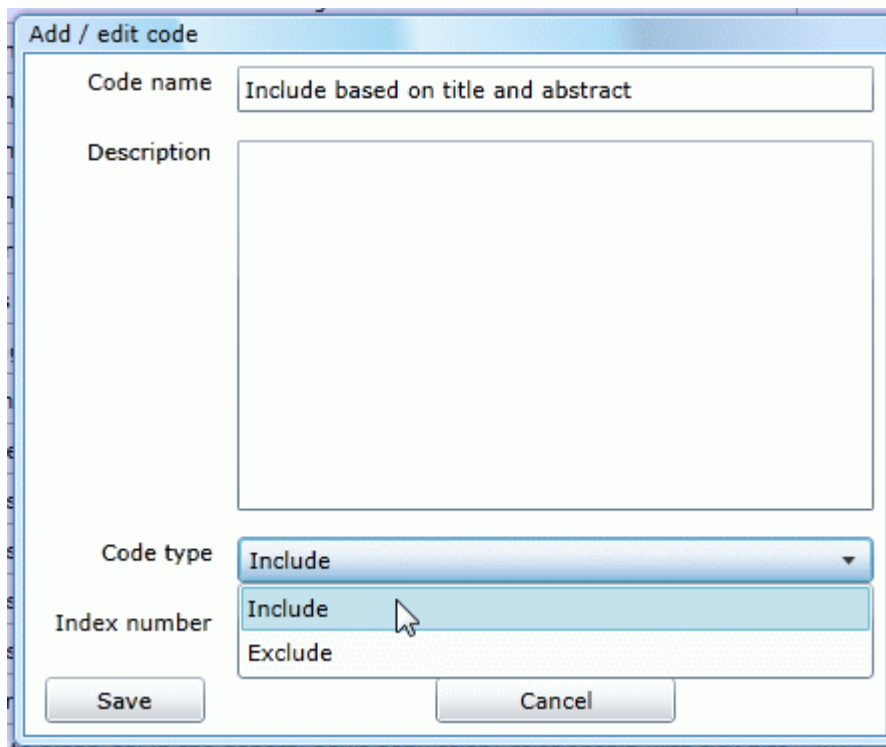
In the window enter a name for one of your codes, such as 'Exclude on date' or 'Include based on title and abstract', the codetype depending on whether it is an include or exclude code and click on **Save**. Do the same for a few more child nodes to create a number of codes to apply to your references. Your code set may look similar to this when finished.
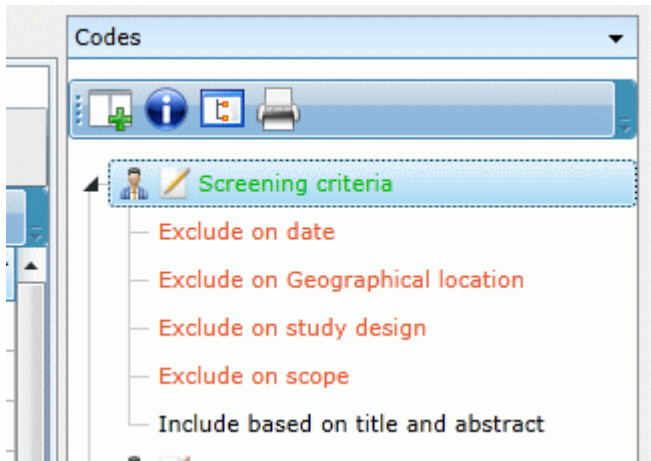
4. The items that you had previously imported for PubMed are displayed in the Documents tab of the Home panel. To apply your new codes to the references click on **Go** for the first reference in the Documents tab of the Home panel. This will open up the Document details window where the reference is displayed on the right side of the screen and the coding tools is displayed on the left hand side. Expand your new code set to reveal the individual codes and apply the codes for each reference. Coding a document means clicking in the checkboxes to assign a particular code to that reference. The program automatically saves your selection when you select a check box. Move through the references using the **Next** and **Previous** buttons until a number of references have been coded and then close the Documents details window.
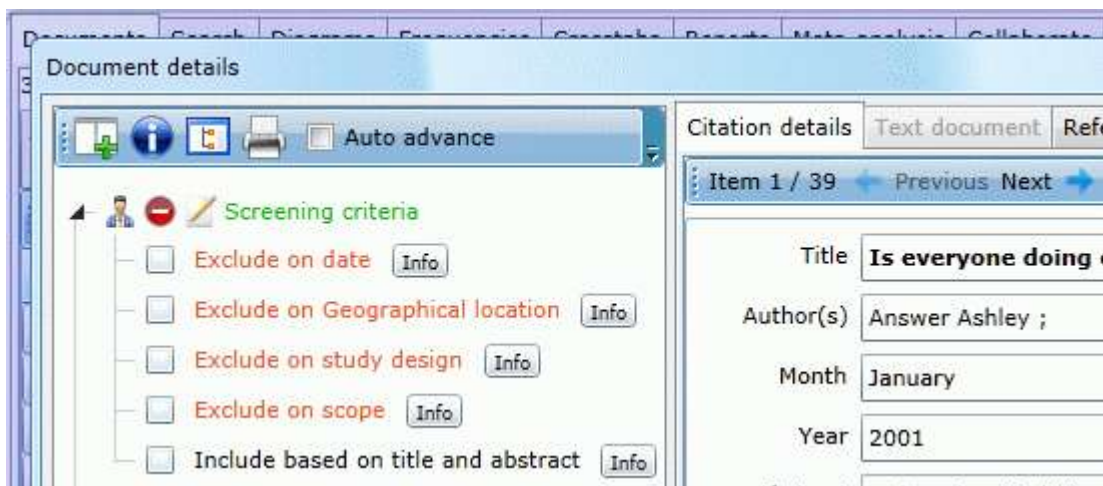
5. Now that the references have been coded you can run a frequency report on the results. Select the **Frequencies** tab of the Home panel. Select the code set you wish to run the frequency report against and then click on **Get frequencies**. The frequencies will be displayed based on your coding along with access to the references.

Document	Search	Diagram	Frequencie	Crosstab	Report	Meta-analys	Collaborat	My inf

Code	▽	Count ▽	Select
Exclude on date		5	Go
Exclude on study design		3	Go
Include based on title and abstract		2	Go
Exclude on Geographical location		1	Go
Exclude on scope		1	Go

Now that you have started, try out many of the other functions and consult the user manual for further details.

Functionality

EPPI-Reviewer 4 is the EPPI-Centre's comprehensive online software tool for research synthesis. It is a web-based software program for managing and analysing data in literature review and has been developed for all types of systematic review such as meta-analysis, framework synthesis and thematic synthesis.

Systematic review

EPPI-Reviewer 4 has the functionality to help manage your systematic review through all stages of the process from bibliographic management, screening, coding and right through to synthesis.
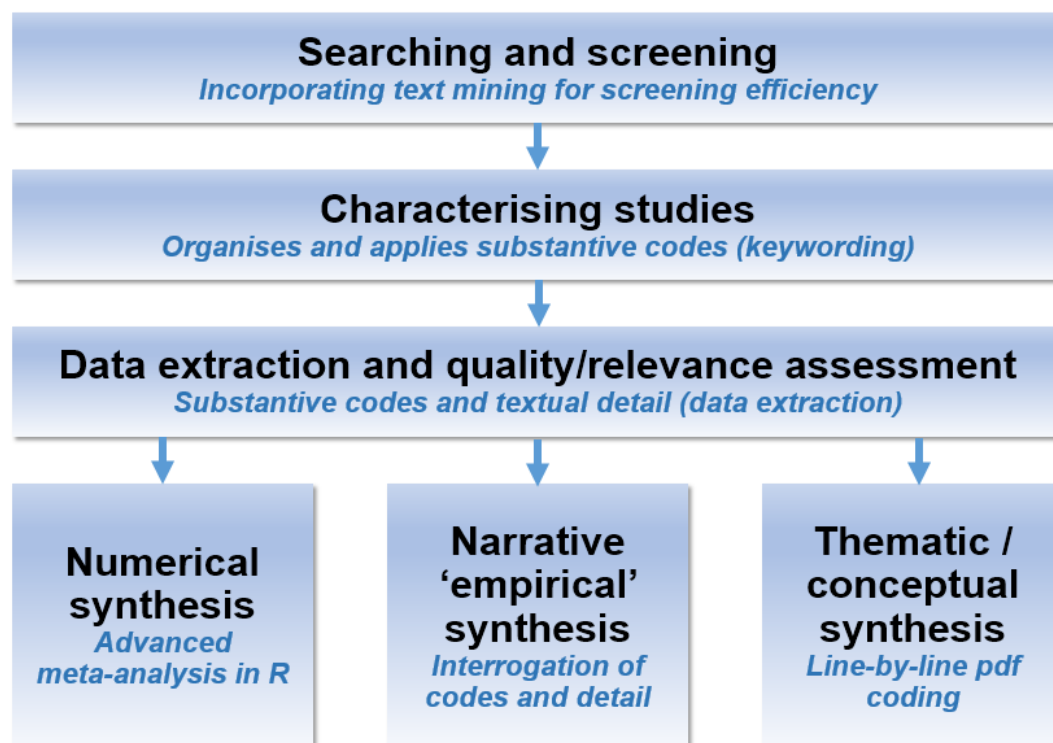
It manages references, stores PDF files, facilitates qualitative and quantitative analyses and allows easy export of review data to enable use with other software programmes.

The software allows multiple concurrent users to access the system and being web-based allows members of a review group to be located in different geographic locations.

EPPI-Reviewer 4 supports many different analytic functions for synthesis including meta-analysis, empirical synthesis and qualitative thematic synthesis. It allows you to present your data in summary diagrams and customisable reports.

Recent additions to the software include text mining, data clustering, classification and term extraction which are leading to new possibilities in the field of systematic reviewing.

Functions

Its many functions include:

Reference management

- Managing the thousands of references that often result from comprehensive searches of electronic databases
- Importing references in a wide variety of 'tagged' formats

- Duplicate checking using 'fuzzy logic'. (Potential duplicates can be checked manually and / or automatically classified as duplicates, depending on how similar they are.)
- Document storage: store the original document file (such as pdf, doc etc) along with the study record.
- 'Linked documents': the 'unit of analysis' in a systematic review is usually the study, but there are often multiple publications originating from the same study; ER4 helps reviewers to use the correct 'unit'.
- Direct access to PubMed through web services. EPPI-Reviewer 4.0 makes use of this capability to allow direct searching and search result data transfer from PubMed.

Study classification and data extraction

- Flexible coding schemas for classifying studies:
  - o Inclusion / exclusion / eligibility criteria;
  - o Codes for descriptive 'mapping' of research activity.
  - o Codes to capture detailed information about a study.
- Concurrent multi-user classification: multiple users can classify studies independently and then compare their results; ER4 works throughout this process, producing summary discrepancy reports and an interface to facilitate the process of agreeing final decisions.
- Bulk application / removal of codes to selected studies
- Calculation of common measures of effect (odds ratios, risk ratios, risk differences, standardized mean differences, mean differences) from a variety of statistics (2 x 2 tables, means, standard deviations, confidence intervals, p, t and r values).
- Text mining: automatic term recognition and document clustering.

Synthesis

- Running meta-analyses (fixed and random effects models); calculating I-squared and supporting sub-group analyses using analog to the anova
- A powerful search engine enabling users to search by categories and text and combine searches using Boolean terms
- Producing reports of categorical, numeric and textual data in a wide variety of formats from frequency reports, crosstabs and full-text reports, to tabular summary reports and summary statistics of numeric data
- Text mining functionality. Automatic document clustering, using text mining, is one way of describing the range of studies you have identified at the click of a button. Text mining can assist with searching by identifying significant terms in the documents you have already included.
- Inductive coding functionality. This allows line by line coding of textual data and organising and structuring these codes graphically into 'conceptual relationship diagrams to display analytic and descriptive themes found through inductive coding.
- Fulltext reference searching using the uploaded pdfs.
- Diagrams to summarise e.g. qualitative syntheses and theories of change for interventions.

Review Management

- The ability to create an unlimited number of non-shareable reviews.
- Allocation of classification tasks (e.g. screening / data extraction) to individual users.
- Work progress reporting.
- Individual reviewer permissions (forthcoming)
- Review flow charts which update automatically (e.g. with counts of how many studies have been included / excluded according to which criterion).
- Easy export of review data to enable use with other software programmes and to enable long term independent storage of data.

Accessing EPPI-Reviewer 4

The login screen can be found at http://eppi.ioe.ac.uk/eppireviewer4/.

You need a Username and Password to access the program. Enter your Username and password in the textboxes and then either hit the return key or click on the **Login** command button. If you see the message '**Invalid Login. Try again**' be sure you have entered your username and password correctly. The password is case sensitive.

If you have successfully logged in you will see all of the reviews that you have access to listed on the screen,

If you are not yet in a review the option to create a first non-shareable review is displayed. Enter a review name into the textbox and click on **New review**. You will now see the Review home screen.

Selecting your review

The reviews that you have access to are listed on the screen once you have logged in successfully. Find the review you wish to work on in the list and click on the command button labelled **Go** next to the review name.

Clicking on **Go** loads the documents for your review. EPPI-Reviewer will preload much of the information needed for working on your review during the 'Loading documents' stage so this step may take a few moments. Once this stage is complete you should be on the review home screen for your review. The review home screen is the starting point for many of the programs operations.

Review home screen

The review home screen provides access to many of the functions in EPPI-Reviewer. It is divided into two tabbed panels; the Home panel and the Toolbox panel.
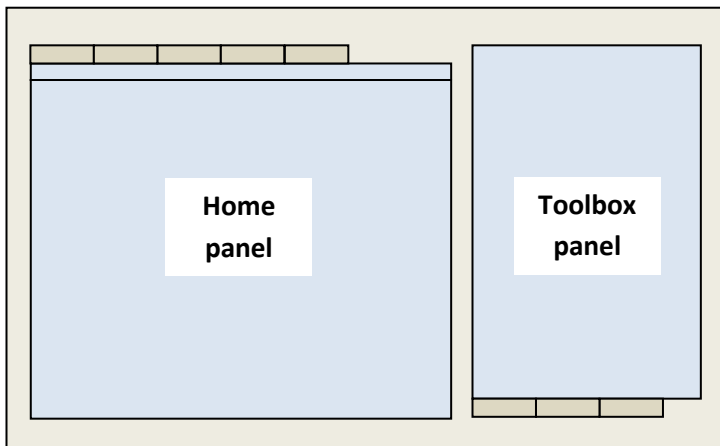
The **Home panel** provides access to the references and many of the operations that you carry out on the references.

The **Toolbox panel** provides access to tools that prepare references for further operations.

Creating a new review

The user can create an unlimited number of non-shareable reviews. A non-shareable review contains only one reviewer; the person who set it up.

To create a new review click on the **My info** tab in the home panel. All existing reviews are listed in a table at the top of the panel. Click on the command button labelled **New review**. A window will appear where the user can enter the review name and select **Save**. The new review will now appear in the list of reviews.

To change the active review click on the command button labelled **Go** next to the review name. Click on the **Go** button to the left of the review name to change the active review.

Changing reviews

The user can change the active review through the **My info** tab in the Home panel. All existing reviews are listed at the top of the panel. To change reviews click on the **Go** button next to the review you wish to change to.

Access for Cochrane Authors

EPPI-Reviewer now includes an open-ended license for use in Cochrane reviews. Anyone registered as a Cochrane author (i.e. anyone with a registered account on Cochrane - https://archie.cochrane.org/) can logon to EPPI-Reviewer and gain almost unrestricted access to the software. As part of the Cochrane Author Support Tool (CAST - http://tech.cochrane.org/our-work/cochrane-author-support-tool) program, Cochrane Authors can now use EPPI-Reviewer, free of charge, for the following scenarios:

- Work on private non-shareable reviews.
- Work on reviews that are registered in Archie (provided that their Archie account has access to them and that they are not checked out elsewhere).
- Work on prospective Archie reviews.

The role of EPPI-Reviewer within the CAST program is to support the production of complex reviews, as well as develop and evaluate new reviewing methodologies. This means that a review in EPPI-Reviewer can be marked as a Prospective Cochrane review. This allows the reviewer to perform experimental/scoping/exploratory work in preparation of what is expected to become a new Cochrane review. To mark a review as a Prospective Cochrane review you will need to get in touch with us.

Licensing for non-Cochrane shared reviews remains unaffected. In such cases, both the review and the accounts used to work on it will still need to be licensed individually.

Logging on with Archie credentials for the first time

Please note that these instructions are for the **first time** that you logon to EPPI-Reviewer via Archie. For subsequent logons the details are listed further down in this document.

The EPPI-Reviewer logon screen includes a link for Cochrane Authors. Click on the link **click HERE to logon with your Archie credentials** to access the logon via Archie features

The following screen simply allows you to **Logon via Archie**. For this step to work, 'Pop-up' windows must be enabled in your browser for EPPI-Reviewer. Your browser will show an alert in case a Pop-Up is blocked. Please use the browser on-screen instructions to allow Pop-Ups, if needed.

Welcome to EPPI-Reviewer 4: software for systematic reviews

This screen allows you to logon in EPPI-Reviewer using your Archie credentials.

<- Back   Logon Via Archie

Clicking the logon button will open a pop-up, please make sure your browser allows pop-ups.

EPPI-Reviewer is now part of the **Cochrane Author Support Tool** project (CAST).

The project includes an open-ended EPPI-Reviewer license for use in private and Cochrane Reviews.

For more information, please see the our Manuals.

The resulting Pop-Up will open a specific Archie page, please enter your Archie credentials.

NEWS   ABOUT   HELP   SUPPORT   PRIVACY | WWW.COCHRANE.ORG

EPPI-Reviewer
would like to connect to your Archie account

User Name:

Password:

LOG IN

Forgot your password?

Not a user? Request a user account

After logging on, Archie will ask your specific permission to exchange data with EPPI-Reviewer on your behalf.

Consent Required

Do you want to enable **EPPI-Reviewer** to perform the following tasks on your behalf?

- Manage documents and reviews
- Manage person records

| Accept | Cancel |

Clicking 'Accept' will close the window (some browsers may ask if that's OK). If your Archie logon details were entered correctly EPPI-Reviewer will show a new screen, allowing to decide how to use the verified Archie credential. Two options are available: users may link their Archie identity to an existing EPPI-Reviewer account or create a new one.

If you already have an EPPI-Reviewer account, please use the first option. It is best to only have one EPPI-Reviewer account that is used for all of your EPPI-Reviewer activities.

Picking the first option 'Link to an existing account' will send you to an additional logon page. This page allows you to certify your EPPI-Reviewer identity by logging on with your EPPI-Reviewer username and password.

If you do not have an EPPI-Reviewer account you can pick the second option and create a new account by filling the form shown below.

After successfully completing this step your list of reviews will be displayed.

Logging on with Archie credentials (after the first time)

These instructions apply once you have already linked your EPPI-Reviewer account with your Archie account. If this is the first time you are logging into EPPI-Reviewer via Archie please see the instructions earlier in this document.

Once your EPPI-Reviewer and Archie accounts have been linked, logging on in the normal way (EPPI-Reviewer credentials) or via Archie will yield the same results. Your lists of reviews will be loaded and shown. Archie accounts will show two list of reviews: the ones that are exclusively held in EPPI-Reviewer, and the reviews available on Archie.

Occasionally, in order to load the list of Archie reviews, EPPI-Reviewer will need to refresh your permissions to exchange data with Archie, and will show the following window:
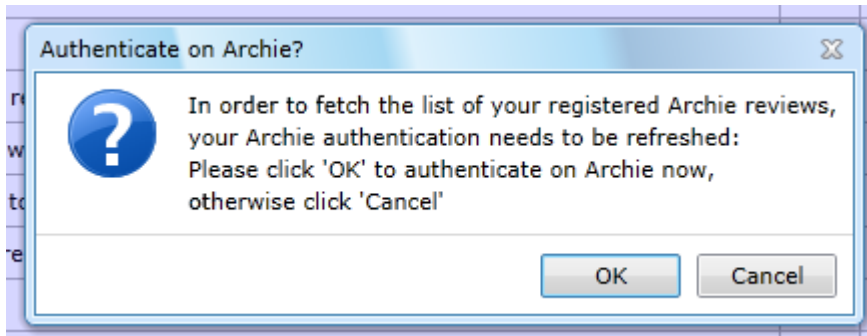
Clicking OK will allow you re-authenticate on Archie (same procedure shown above), clicking Cancel will prevent EPPI-Reviewer from collecting the list of your Archie review. Therefore, in the latter case, you won't be able to access your Archie reviews from within EPPI-Reviewer. To solve this, reload the EPPI-Reviewer page and either log on via Archie or click "OK" when the dialog above is shown again.

Working with Archie reviews

Once logged on, two lists or reviews will be available, in two separate tabs. The "Archie Reviews" tab is shown below:

Reviews that were never opened in EPPI-Reviewer will only show the "Check Out" button. Once a review has been checked out by EPPI-Reviewer at least once, the "Open" button will appear. EPPI-Reviewer will use Archie to fetch the list of revi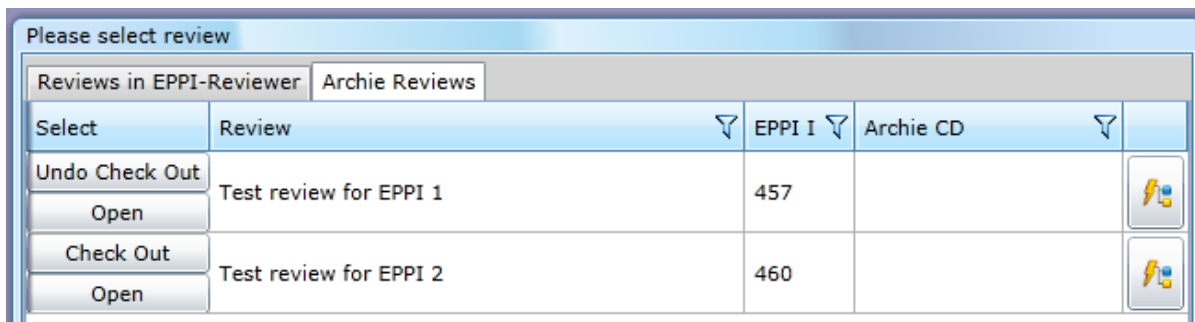ews you have access to and will control the read-write access to each review based on its checked in/out status. The following rules apply:

- A review checked out by EPPI-Reviewer allows Read and Write access.
- All other states, not checked out, or checked out from Archie by some other tool (RevMan, Covidence) will be read-only in EPPI-Reviewer.

At the present time EPPI-Reviewer currently can't exchange data with Archie, RevMan or the Cochrane Registry of Studies (CRS), it only allows you to 'Undo Check Out'. Development to allow checking in of review data back to Archie/RevMan is in progress and will be available in future releases of EPPI-Reviewer. This documentation will be updated once that functionality is available.

If a review is checked back in while other Authors are logged on and working in the review, within 30 seconds the system will pick up the change (the review should now allow access only in Read-Only) and currently logged on users will be automatically be logged out.

Bringing references into your review

There are a number of different ways to bring references into your review. You can carry out searches on external databases and import the saved text file results into the program. For some external databases, such as PubMed you access the database using EPPI-Reviewer and load your references directly into the software. You can also enter references manually.

Importing text file search results

When you carry out a search on an external database, you can normally save the results of the search in a format that is appropriate for importing. The file to import must be in a tagged format. This means that each piece of information must be clearly labelled so an import filter can identify it. For example, the author information will normally be identified by a heading such as AU or Author. A typical tagged reference might look something like this:

AN: 343708-100300
TI: The five dimensions of social pedagogy within schools.
AU: KYRIACOU, C
AB: This paper discusses social pedagogy in the context of schools, which it defines as taking an integrated view of the whole child in terms of five key dimensions: care and welfare; inclusion; socialisation; academic support; and social education. Considers the implications for professional practice within schools if a social pedagogical approach is adopted and the advantages of such an approach.
DE: SOCIAL PEDAGOGUES, WORKING WITH CHILDREN, SCHOOLS, PUPILS, TEACHERS, PRACTICE, INTERAGENCY RELATIONS, INCLUSION, WELLBEING, SOCIAL SKILLS, ATTITUDES, BEHAVIOUR, PSHE, PERSONAL AND SOCIAL EDUCATION, HEALTH EDUCATION, PASTORAL CARE
SO: Pastoral Care in Education, vol.27, no.2 (Jun). pp101-108. 2009
PT: Journal Article
YR: 2009
UP: 200910

Search results can exist in hundreds of different formats. Each database may be different but most should have some type of tagged format available.

To import your search results into EPPI-Reviewer select the Sources tab on the toolbox panel to access to the source and importing functions.

Data is imported into a search 'source' to create a log of searches that have been carried out. At the top of the Sources tab of toolbox panel you can see a table. Each time a new source is imported it will be added to this table.

	You can reach the Add Source window by clicking on the **Import references** icon at the top of the Documents tab of the Home panel

You can also add a new source by clicking on the link labelled **Manage sources / save new** in the sources tab. This will open the **Add source** window.

In the Add source window be sure the **Import New** tab is selected.

Select the appropriate import filter from the dropdown menu labelled **Import Filter**. Although there are only a few import filters available in EPPI-Reviewer 4 you have access to hundreds of filters through the 'Export to RIS function' on the EPPI-Reviewer 4 gateway (http://eppi.ioe.ac.uk/cms/er4) that is available through the EPPI-Centre website (http://eppi.ioe.ac.uk). These are all of the filters that were created for EPPI-Reviewer 3.0. The 'Export to RIS' utility

will take your file and return an RIS formatted file that will import easily into EPPI-Reviewer 4. Full instructions on using this utility are available on the 'Export to RIS' page.

Now click on the **Read file** button and choose the text file containing your search results. The name of the file selected will appear in the Name box. The software will load the file and separate it into individual references. The references titles are displayed in the text box in the bottom half of the page.

If you decide that the items displayed appear correct click on the command button labelled **Upload items** at the bottom of the screen and the items will be uploaded to your review. Close the **Add source** window to return to the Review home screen where you items will be listed in the Documents tab of the Home panel.

Importing directly from external databases

Some databases such as PubMed allow software to access their data directly. EPPI-Reviewer allows you to connect to this database directly to run your search and return your search results.

Select the Sources tab on the toolbox panel to access to the source and importing functions. Click on the link labelled '**Mange sources / save new**'. This will open the **Add source** window.

In the Add source window be sure the **PubMed Import** tab is selected.

Enter you search terms into text box labelled **Search PubMed**. You should also enter data in the **Source Name** and **Notes** boxes. Now click on the command button labelled **Search PubMed** to run your search. The system will access PubMed and show the results in the box at the bottom of the screen.

If you are satisfied with the results click on the command button labelled Import and the items will be uploaded to your review. Close the **Add source** window to return to the Review home screen where you items will be listed in the documents tab of the Home panel.

Manually adding references

References can be entering individually by hand. On the Documents tab of the home panel there is a **Create new document record** icon. Click on this button to go open the **Document details** window.

 This is the **Create new documents record** icon that can be found at the top of the Documents tab of the Home panel.
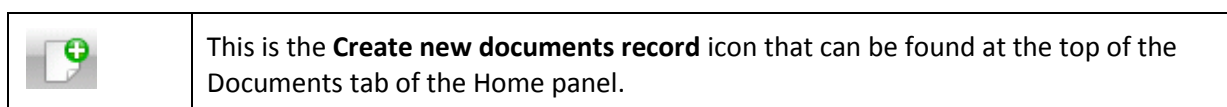
First select the publication type by picking from the **Pub type** drop down menu. The fields available to fill in will change based on the publication type selected.

Fill in as many fields as possible and then click on the command button labelled **Save**. The item is saved to your review and you are returned to the Review home screen.

Uploading full text documents

You can upload and access the full text version of a document in EPPI-Reviewer. Any type of file can be uploaded. Word and pdf files, when uploaded will have their content extracted into a text format.

To upload a file, select the reference from the Documents tabs of the Home panel. This will open the Documents details window. In the Citation details tab, near the bottom is a table where any uploaded files are displayed. Click on the button labelled **Upload**. You can now browse to the location of the file to upload. Select the file and click

Open. The Selected file window will be visible where you can click on Upload. This will upload the file into the review.

There is a file size limit of 15 Mbytes. Files larger than this will need to be subdivided or reduced in size before they can be uploaded.

You should now see it in the table of uploaded files. In the 'View text' column clicking on **Go!** will open the textual content of the document and display it in the 'Text document' tab. Clicking in the View original column will open the document in its native format. This may be in a new tab or window depending on the document type.

If the document is a pdf you can click in the 'View pdf' column. The pdf will open within EPPI-Reviewer 4.
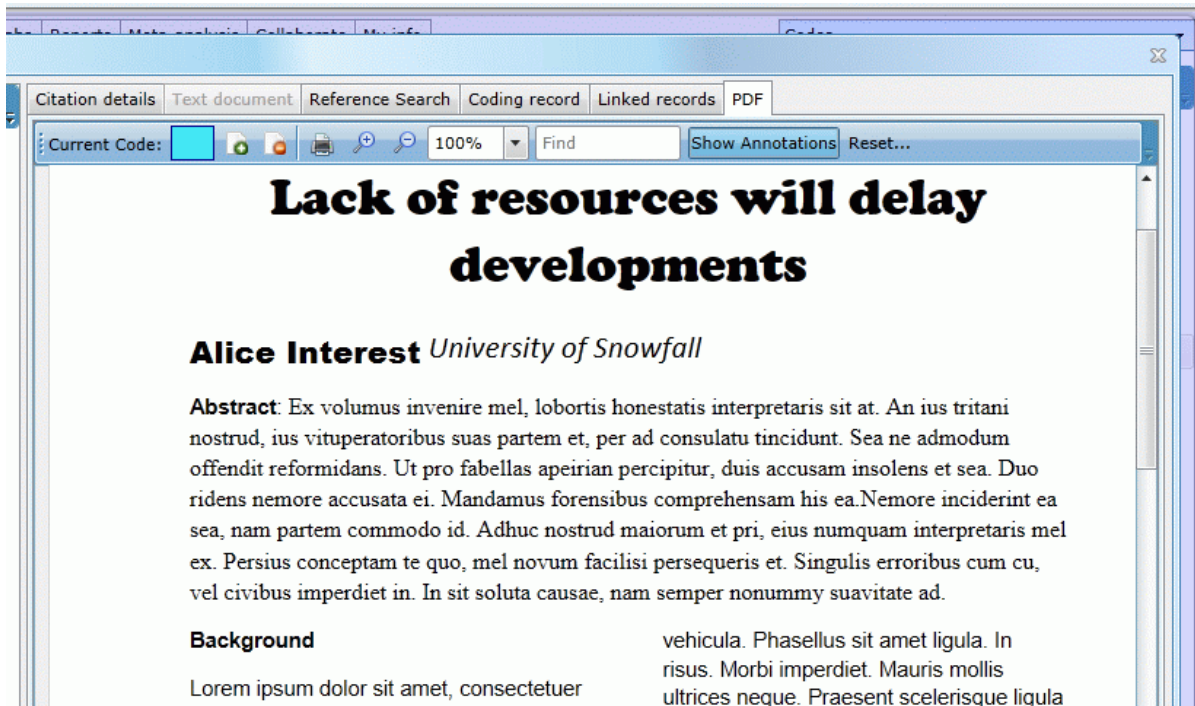
In this view you can also add annotations to the document using the commands at the top of the screen. PDF annotations are short comments that reviewers may add to a PDF document. They should not be used to hold coding information as they cannot be searched, exported or included in reports.

To add an annotation click the **Show Annotations** button to display the annotations column. Now double click in the column where you want the annotation to display. This will open the 'New Annotation' window where you can enter you comment and then click **Save**. The annotation will be displayed in the semi-transparent right hand column.

Double clicking an existing annotation will allow you to edit or delete it. Annotations can be dragged up and down within a page but cannot be moved to a new page.

When the annotations are visible the annotations button will change to **Hide Annotations**. Clicking on the annotations button now will hide the annotations column.

Extracting references from uploaded documents

If you have uploaded full text documents that contain a reference list, EPPI-Reviewer will help you extract the references and carry out searches for those references.
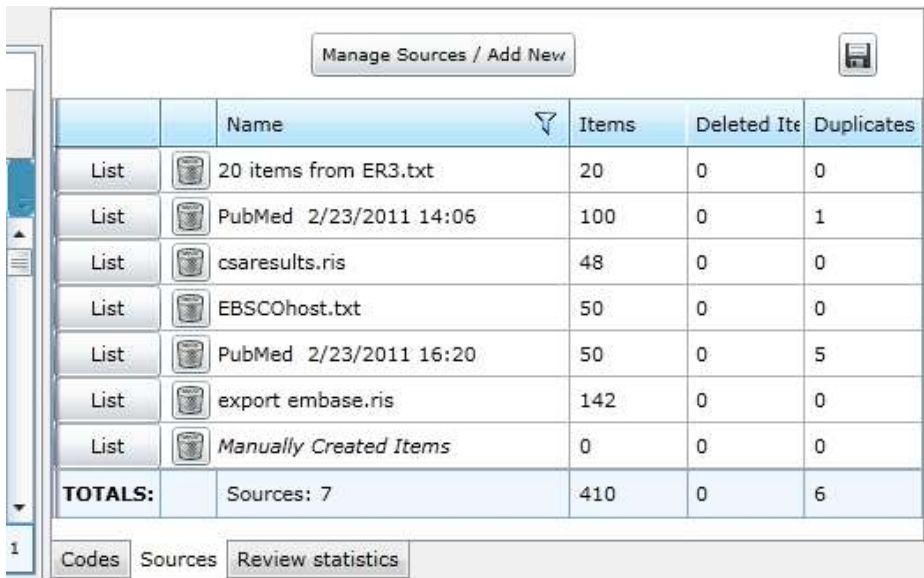
For example, if you have uploaded an article in pdf format, click on **Go!** in the 'View text' column of the list of uploaded files. The textual content of the file is displayed in the Text document tab. Select the text that you wish to extract the reference from. This is often at the end of the pdf. Right click and select **Send Selection to Reference Search**. The selected text is now displayed in the Reference Search tab and to the right of it the separated references are displayed. You may need to edit the text to get the references to separate correctly. There is a help screen available on this page giving tips on how best to use this feature. To show the help screen click on the button labelled **?** near the top of the reference list.

Once you are satisfied with the reference separation, you can run searches for the items in Google, Bing, PubMed and ROAR (Registry of Open Access Repositories) by selecting a reference and clicking on the links below the references. There may be multiple links for each place that you can search. This means that the system is using different variations of the content of the reference to carry out the search.

Managing your search sources

Each time a new import occurs a line is added to the list of sources. This list is displayed on in the Sources tab. This table shows the all of the sources, the number of items imported, the number of deleted items and the number of duplicates identified using the duplicated checking functions.

Manually created items are given a line in the table as well. All manually created items are placed in the source called *Manually create items*.

		Name	Items	Deleted Ite	Duplicates
List		20 items from ER3.txt	20	0	0
List		PubMed 2/23/2011 14:06	100	0	1
List		csaresults.ris	48	0	0
List		EBSCOhost.txt	50	0	0
List		PubMed 2/23/2011 16:20	50	0	5
List		export embase.ris	142	0	0
List		*Manually Created Items*	0	0	0
TOTALS:		Sources: 7	410	0	6

Codes   Sources   Review statistics

You can edit the details of a source by clicking on the **Manage source / Add new** button in the Sources tab of the Toolbox panel. This will take you to the Add Source window.

Select the source you would like to edit from the Used Sources List on the right side of the window. Then click on the Manage Sources tab at the top left side of the window.

There are a number of text boxes available where you can enter further information about search. When you are finished your edits be sure to select the **Save** button just below the Manage Sources tab.

You can export a list of your search sources in the sources tab of the Toolbox panel. Next to the **Manage source / Add new** button is the **Export Sources Table** icon.

	The **Export Sources Table** icon can be found at the top of the Sources tab of the Toolbox panel.

Clicking on the icon will open a Save As window where you can select the location and name of the file to save. The file will be save as an .xls file that can be opened in Excel.

Deleting a search source

Quite often a reviewer may refine their search strategy resulting in searches being re-run. This could result in uploaded search sources that are no longer relevant and require removal.

To remove a search source first mark it as deleted in the Sources tab of the Toolbox panel by clicking on the delete source icon, shaped like a garbage can, next to the source name. This will mark the items in the source as deleted but not permanently remove them.

To undelete a search source click on the undelete source icon, shaped like a return arrow, next to the source name. All items in that source will change from delete to include.

To permanently remove the source and all of the items in it, click on the Manage Sources / Add New button at the top of the Sources tab. This will open the Add Source window. Select the Manage Sources tab on the left hand side. Now select the source to permanently remove in the Used Sources List. If the source has already been marked as Deleted and none of the items in the source are marked as Master items after duplicate checking it will be eligible for permanent deletion. If it is eligible you should see a red X in the Add Source window. Click on the X and a confirmation window will appear. Clicking on Yes will delete the source and all of the items in that source. If you click on Yes the deletion cannot be undone so please be sure are deleting the correct source.

Managing your documents

Documents that are imported or manually created are displayed in the Documents tab of the home panel. By default the Authors, Title and Year fields are displayed. If you wish to change the fields displayed click on the **Select the fields you want to display below** icon that can be found at the top of the Documents tab

	The **Select the fields you want to display below** icon can be found at the top of the Documents tab of the Home panel.

This will open the Select fields to display window. Click on the fields you would like to display and then click on **Close**.
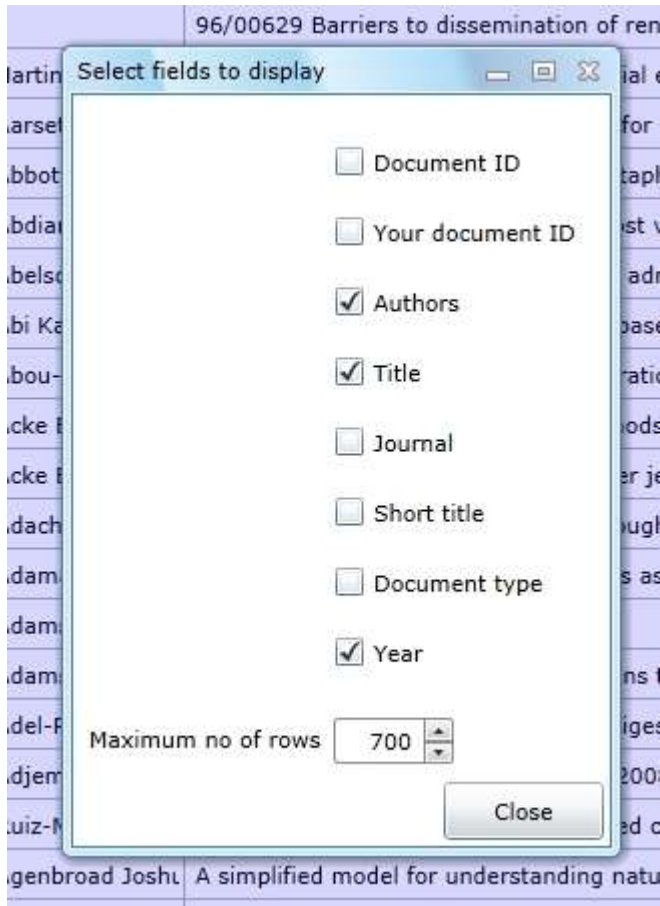
By default the documents are loaded 700 items at a time. If there are more than 700 documents in your review, they will be paged. You can change pages at the bottom of the Documents tab. You can change the number of documents in a page in the Select fields to display window.

In the documents tab you can also order the fields by dragging the header columns left or right in the table.

You can change the order of items on a page by clicking on the column name in the Documents tab. If you click on the 'Authors' column it will order by Authors. If you click on the 'Title' column it will order by Title.

You can filter what is displayed by typing in the **Find:** textbox at the top of the Documents tab. As you type in the box the items in the table will filter down in real time based on what you type.

You can also filter what is displayed on each page by clicking on the filter icon (the one that looks like a funnel) in the header of each column. This is a very powerful filter that gives you a number of options of what to display. It is column specific.

The ordering and filtering are page specific so if you have more that 700 items you will need to move to the correct page and then run any filtering or reordering functions.

Included / Excluded / Deleted documents

Items in EPPI-Reviewer can be labelled as Included, Excluded or Deleted.

Included or Excluded items do not necessarily refer to the screening criteria applied to an item. Whether an item is included or excluded from your review could depend on a number of different judgements so the Include or Exclude flags are a method of indicating an items status and aid in information management.

For example, a user may have many thousands of items that require screening. The process of screening might narrow the items for further coding to hundreds and further coding might reduce the number of items to dozens. The user can dynamically change what items are considered included or excluded to help identify the items they are presently working with. The items considered included or excluded might change often based on the reviewer's requirements at that time.

By default, documents brought into a review are marked as 'Included' unless the user decides otherwise. All includes items can be displayed by clicking on the **List included documents** icon.

	The **List included documents** icon can be found at the top of the Documents tab of the Home panel.
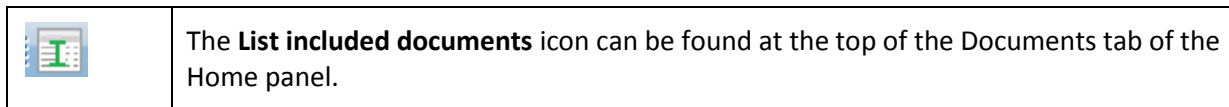
The documents marked as Excluded or Deleted can be listed by clicking on the corresponding icons.

	The **List excluded documents** icon can be found at the top of the Documents tab of the Home panel

	The **List deleted documents** icon can be found at the top of the Documents tab of the Home panel.
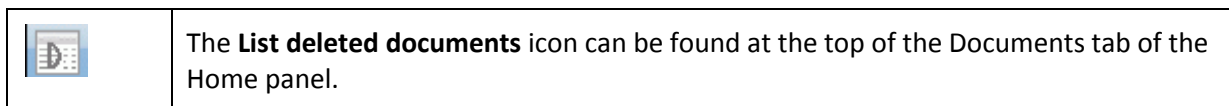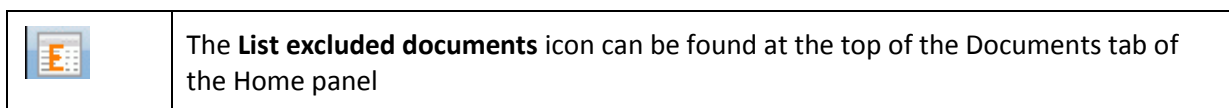
You can mark an item with an Include or Exclude flag based on previously assigned codes or by selecting individual items.

Changing an items Include / Exclude / Delete flag

To mark an item or items as being included based on previously assigned codes click on the icon labelled **Assign documents to be included or excluded**.

	The **Assign documents to be included or excluded** icon can be found at the top of the Documents tab of the Home panel.
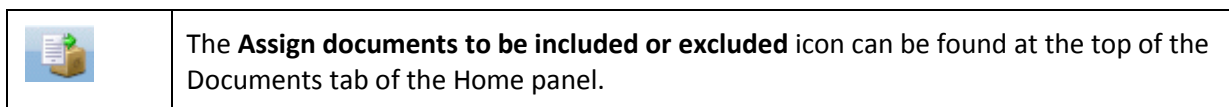
This will open the Assign documents dialog window.
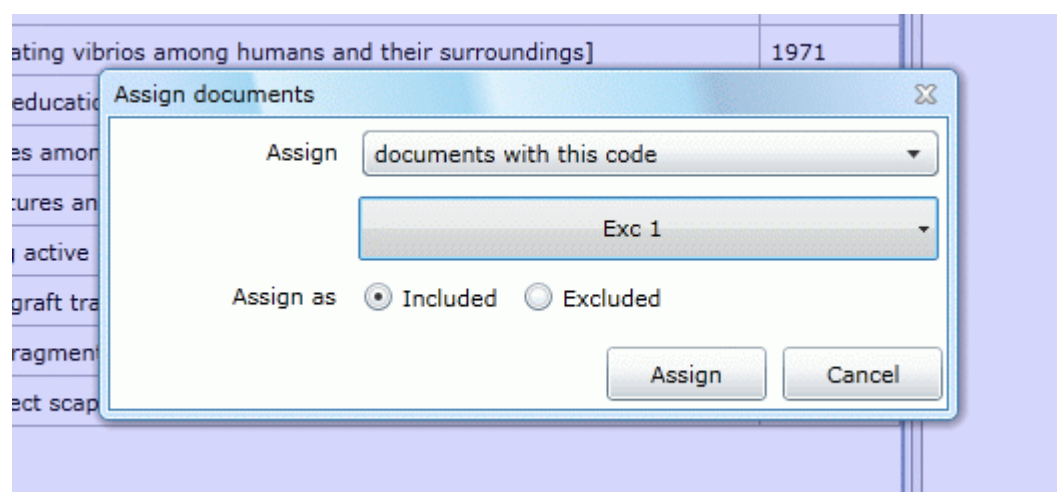
From the Assign dropdown menu select the **documents with this code** option.

A second dropdown menu will appear containing the codesets. You can expand the codesets to find the conditional code for the assignment.

You should now click on Include or Exclude in the dialog window depending on the assignment you wish to make. Finally click on the Assign button. All the items marked with the selected code will be assign the Include or Exclude flag depending on the choice made.

If you wish to just assign selected items with a code, first click on the items to assign in the Documents tab. Then click on the **Assign documents to be included or excluded** icon to open the **Assign documents** dialog window. In the Assign dropdown menu select **selected documents** and click on either Included or Excluded. Now click on **Assign** and the Exclude or Include flag will be assigned to the selected documents.

If you wish to mark selected items as deleted, first click on the items to delete in the Documents tab. Now click on the **Delete selected documents** icon. A confirmation window will appear allowing you to complete the operation

	The **Delete selected documents** icon can be found at the top of the Documents tab of the Home panel.

An item marked as delete is still in the review. Deleted items can be listed by clicking on the **List deleted documents** icon. Its status can be changed back to Include or Exclude in the normal fashion described above.

Items can also be marked as Deleted when the search source it belongs to is deleted. When a search source is deleted, it is not physically deleted. It remains in the review but is just shown as deleted allowing it to be recovered at any time. Undeleting a source will mark all of its items as includes. Sources can be deleted, or recovered in the Sources tab of the Toolbox panel.

You may also notice that all items in a deleted source are marked as Shadow (S) rather than I, E or D. This means that the item is out of the review but still exists and can be returned to the review if necessary. Duplicate items are also marked as Shadow (S).

Creating reference lists

To create a reference list, select the items that will be in the list. Then click on the **List formatted bibliography** icon at the top of the Documents tab.

	The **List formatted bibliography** icon can be found at the top of the Documents tab of the Home panel.

Clicking on the icon will display the formatted references in the Report viewer window. The Report viewer window is a full editor that will allow the user to format, save and print the list of references.

Exporting documents

To export references out of EPPI-Reviewer 4, select the references you want to export in the Documents tab. Then click on the **Export references** icon at the top of the Documents tab.

	The **Export references** icon can be found at the top of the Documents tab of the Home panel.

An RIS formatted text file is generated and you will be prompted to name and save it. RIS files can be imported into most reference management software including EndNote, Procite, Reference Manager and EPPI-Reviewer.

Managing duplicate documents

If you are importing documents from multiple databases you will likely have duplicate versions of some documents. EPPI-Reviewer will help identify and manage those duplicates.
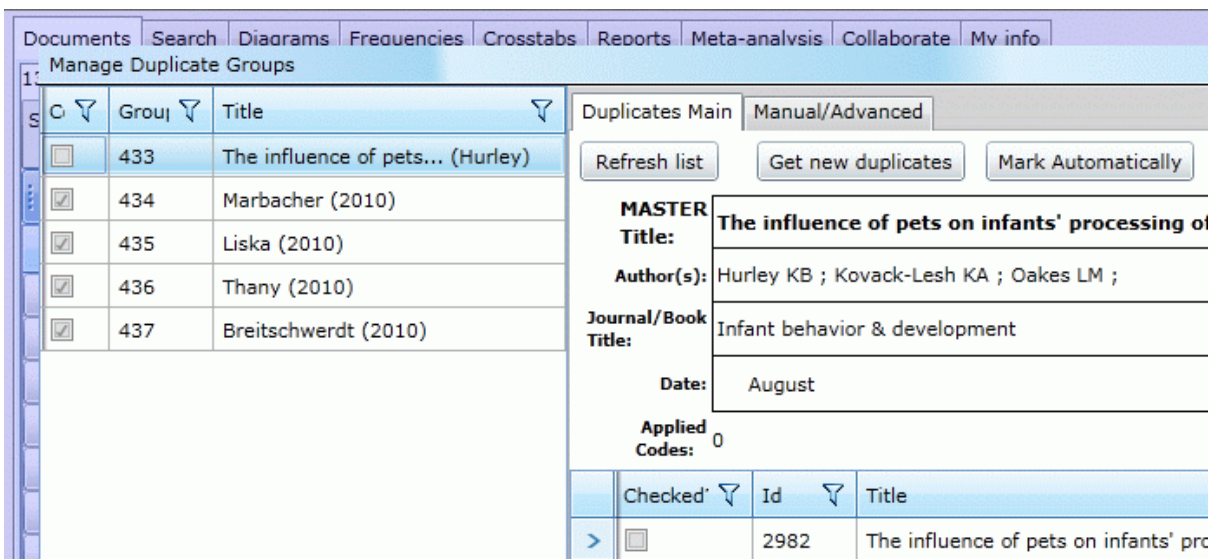
> If possible, it is a good idea to finish the importing of your references before carrying out duplicate checking. This will avoid you having to check for duplicates multiple times whenever new items are brought into the review and will avoid the creation of overlapping duplicate groups.
>
> As well, it is best to finish duplicate checking before you start coding items to avoid the situation of coded items being marked as duplicates.

To identify duplicate documents click on the **Manage duplicates** icon located on the Documents tab of the Home panel.

	This is the **Manage duplicates** icon that can be found at the top of the Documents tab of the Home panel.
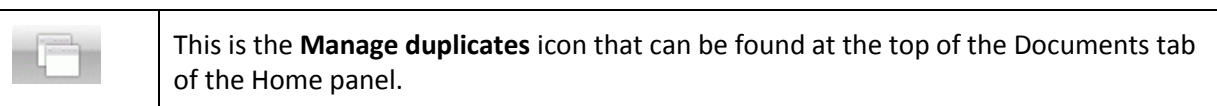
This will bring up the Manage Duplicate Groups window. From this window click on the **Get new duplicates** button to list all of the possible duplicates.

When you click on this button the system goes through all the items in the review and compares each item with all of the others. It calculates a score based on the authors and titles, book authors and titles, when applicable, and journal names, when applicable. If the score is 1, the chance of an exact match is 100%. The possible duplicates are grouped together into duplicate groups that are displayed on the left side of the screen. Each group holds items that the system believes are similar.

Once this list of duplicate groups is created you can begin working with it. You should only need to click on the **Get new duplicates** button when new items are added to your review.

If your review has many thousands of items, it may take a few minutes to complete this operation. In this case, after 5 minutes you will get a message telling you that the system is still compiling your list. You will not be able to access the duplicate checking screen during this time but you will still be able to access the rest of the program.
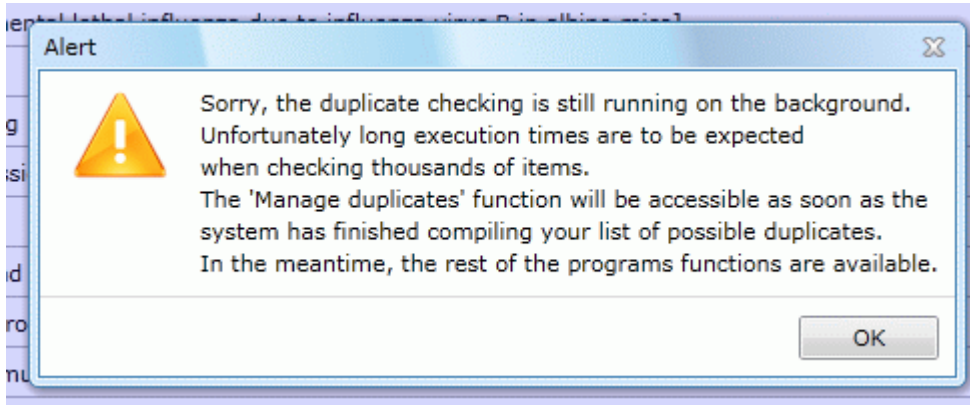
If the user clicks on the button labelled **Mark Automatically**, the program will mark all of items with a score of 1 as checked and assign a duplicate / master relationship among the items based on the statistics calculated when the **Get new duplicates** operation was first run. This should narrow down the number of duplicate groups that the user needs to check manually. Something to watch out for with this operation is that it will ignore items that have a code assigned to it or have a file uploaded. This is to avoid the situation where an item that has already been coded ending up as a duplicate.

When a group of possible duplicates are marked as complete it will be indicated in the list of item groups on the left hand side by having a check in the checkbox. To identify the groups of items that still need to be addressed you can filter the Complete column by clicking on the filter icon (the one that looks like a funnel) and setting the **Is equal to** option to **False**. This results in only the unchecked items appearing in the list. You can also order the checkbox column so all of the unchecked items are displayed first.

To manually deal with a duplicate group, click on the row in the list of groups. This will display the items on the right side of the page. At the top the Master item is listed. Underneath are the possible duplicates.

Click on the title in one of the items in the list of possible duplicates to expand it.

Determine whether the expanded item is a duplicate of the master item.

Whenever a field (Title, Journal, Authors, etc.) is different, the text on the master item will be highlighted with four different background hues to help quickly identify the differences. The brighter the hue, the larger the difference detected. This means that items without highlights are identical to the master.

If a field is empty in either the master or group member, it will be highlighted with a lighter hue to show that there is a slight difference. If a field is different then it will be highlighted in a darker hue.

If it is a duplicate, click on the **A duplicate** button to mark it. The check boxes labelled **This is a duplicate** and **This item has been checked** will now be ticked. It will also show as having been checked in the list of groups on the left hand side

If the two items are not duplicates click on the **Not a duplicate** button. This action will also check the **This item has been checked** box.

If you wish to make the possible duplicate the master item click on the **Mark as Master** button and the duplicate and master will switch places. You will still need to mark the initial master as a duplicate of the new master.

Move through each row in the list of duplicate groups table assigning the items as duplicates or not duplicates.

If you are duplicate checking after coding has started, pay attention to the **Applied Codes** field. It will tell you if the document has been coded yet. This will help you determine which item you should mark it as the duplicate. If an item has already been coded you may wish to keep it as the master item and mark other items as duplicates of this one.

If you come across a group where all of the items are greyed out this means that the master item for the group has also been marked as a duplicate in a different group. This is possible if new items have been added to the review and the Get new duplicates function has been run multiple times. An item can end up in more than one duplicate group depending on the information contained in the reference. In this case, the user should choose a different item to be the master item. Please see the section on Overlapping duplicate groups.

If you are returning to the duplicate function after previously running the duplicate check but not having finished you should first click on the **Refresh list** button. This will bring up the list as you left off the previous time without re-running the duplicate checking function. You can then carry checking duplicates where you left off.

If you are returning to the duplicate function after uploading more documents you should click on the **Get new duplicates** button. This will look for new possible duplicates but will not affect any duplicate checking that you have already done.

After completing the duplicate checking close the Duplicates window. On the Documents tab click on the **List included documents** icon and the items marked as duplicates will be removed from the list.

When an item is marked as a duplicate it will no longer show up in the review. It has not been deleted and can still be retrieved if necessary. A duplicate is assigned a special flag called Shadow (S). You can see the shadow items if you list a source on the Sources tab of the Toolbox panel. Rather than just seeing I, E or D flags, there will also be S flags for the items in the source that have been marked as duplicates.

Manually adding a duplicate

If you find a duplicate item that was not picked up by the Get new duplicates you can manually add it to a group. In the manage duplicates window there is a **Manual/Advance** tab. When you click on this tab the items in the duplicate group selected on the left is displayed. At the bottom of the screen is the list of items that were displayed in the Duplicates tab.

Select an item from this list by clicking on the checkbox and then click on the **Add selected item(s)** link at the top of the list. The selected item will be added to the group and marked as a duplicate. All items manually added as duplicates are listed below the item details in this tab. An item can be removed from this list by clicking on the **Remove** button next to the item.

At the top of the **Documents from Main List** there are other options including **Add Group** and **Advanced Mark Automatically.**

Add Group allows the user to take the items from one duplicate group and add them to a different duplicate group.
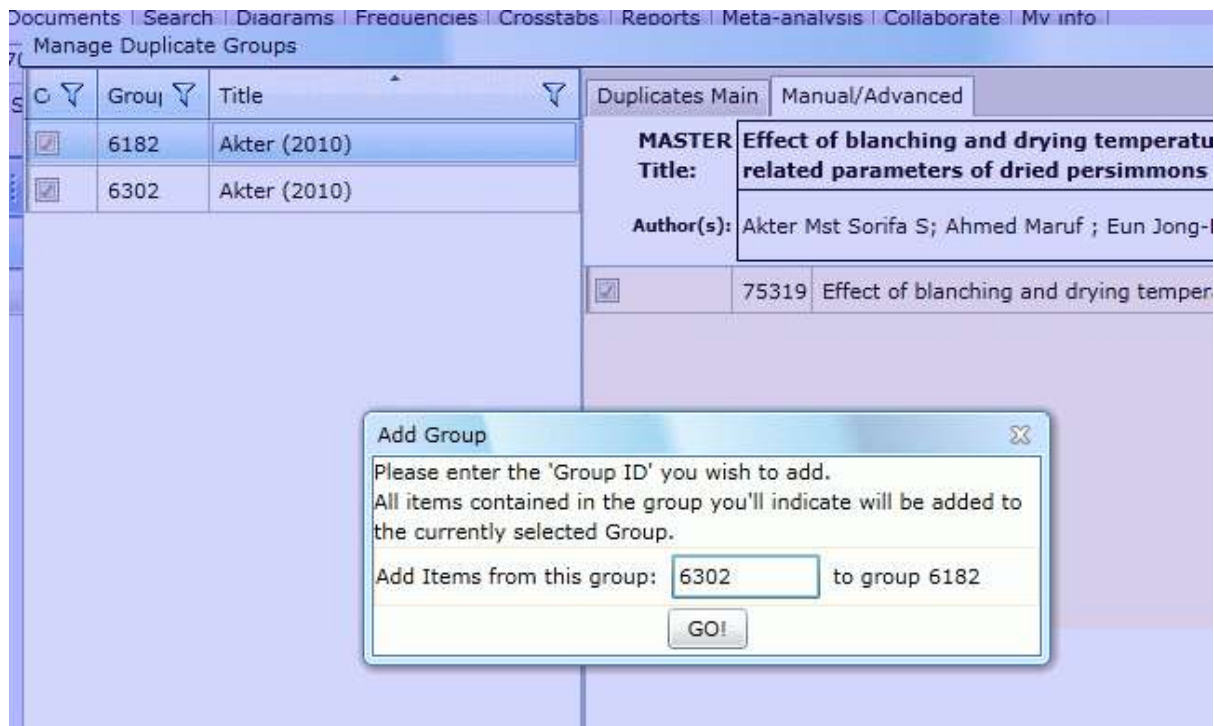
Click on the **Add Group** link at the top of the list and an Add Group box will appear. Enter the group ID from the list on the left side of the screen and click on **Go**. The items from selected group will be placed in the group listed at the top of the screen.

The Advanced Mark Automatically option allows the user to adjust a number of thresholds that the Mark Automatically function considers.
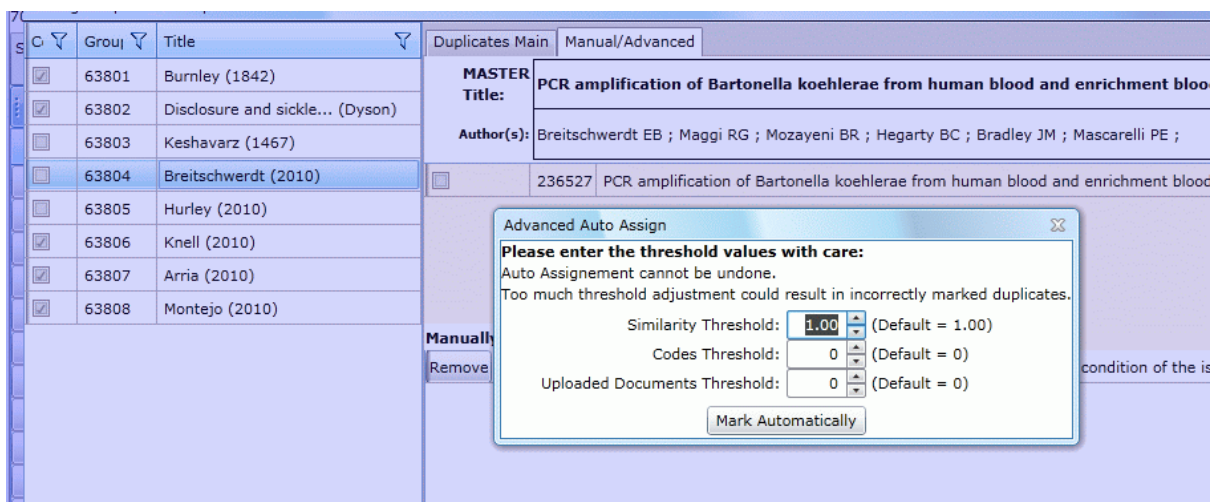
The Similarity Threshold tells the system how close a match must be for the Mark Automatically function to use. By default the setting is 1.0. If the threshold is lowered the sensitivity of the matching will be lowered.

Note: Adjusting the Similarity threshold must be used with caution as it could lead to incorrect matches. Correcting false positive matches can be difficult as you may not know they exist and finding them may require looking through all of the duplicate groups.

The Codes threshold and the Uploaded Documents threshold allow coded items and items with uploaded documents to be considered by the Mark Automatically function. By default this function will ignore items that have been coded and items that have uploaded documents.

Overlapping duplicate groups

When **Get new duplicates** is run multiple times due to new items entering the review it is possible that overlapping duplicate groups are created. This means that the same item may appear in multiple groups. Since the master item is chosen automatically when **Get new duplicates** is run, new and larger versions of existing groups may appear. Sorting out these overlapping groups can sometimes become complicated.

An overlap group can be identified as it will normally contain a greyed out group member (meaning the **A duplicate**, **Not a duplicate** and **Mark as Master** are greyed out). This means that this item is either

- marked as a master in a different group or
- is already marked as a duplicate in a different group.

Sometimes the entire group is greyed out. This would indicate that the master item for this group is marked as a duplicate in a different group.

The best way to deal with overlapping groups is to:

1. Select the group with the greyed out items from the list of groups on the left
2. Go to the Manual/Advanced tab and use the 'find related groups' function to identify the overlapping groups. This function is described in the previous section.
3. Among the related list of overlapping groups, there should be one group that contains all of the items found in the other related groups. This will normally be the group with the highest Group ID number (the most recently created group). You can examine the items in each group to confirm this.
4. Delete all of the other related groups. This is done by selecting the group to delete over on the left and clicking on the trash can icon (labelled Delete the current group).
5. You should now just have a single group of duplicates rather than overlapping groups.

Please note also that with the previous update we have added the "Reset" features to deal with situations where a huge number of overlapping groups are present. The "Reset" features are explained within EPPI-Reviewer and should be used with care!

Create a new duplicate group

If the **Get new duplicates** function has not spotted some items as being duplicated you can create a new group and add items to it.

On the Manual/Advanced tab there is an icon that looks like a blue addition symbol. It is labelled 'Add new group'. If you click on this icon the **Create New Group** window will appear.
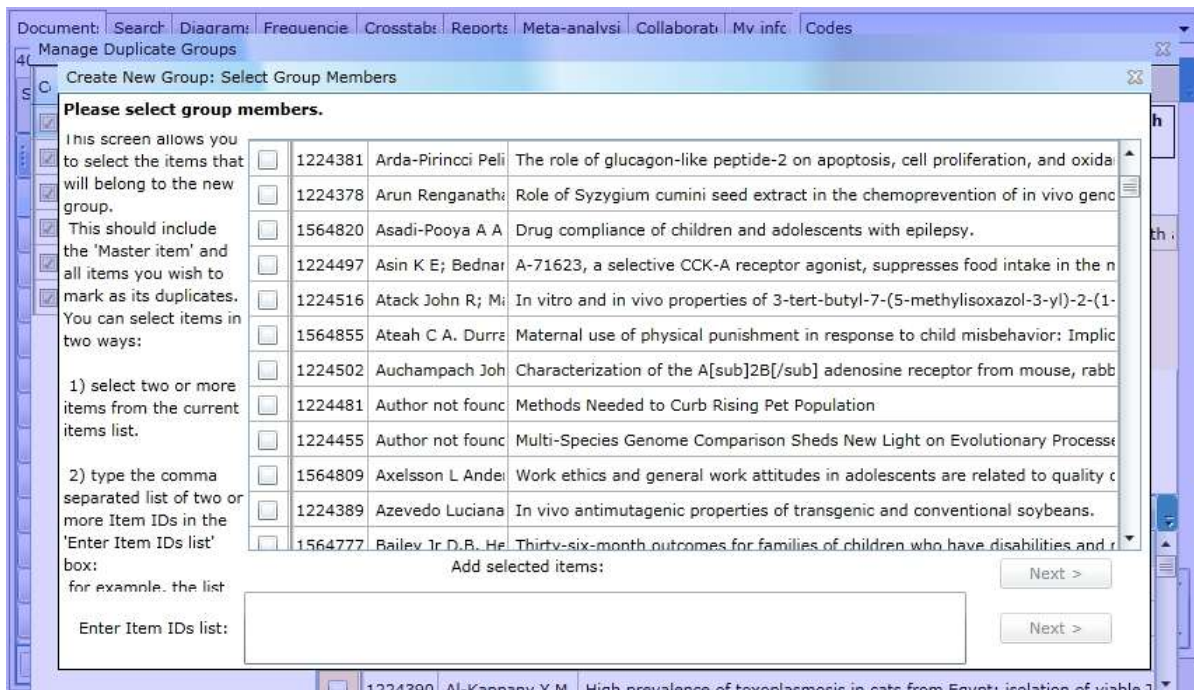
All of the items that were displayed on the Documents tab before you entered the duplicate checking screen are displayed. You can click on the items that should be in the group or enter the ID's of the items in the box below. Then click on the **Next** button.
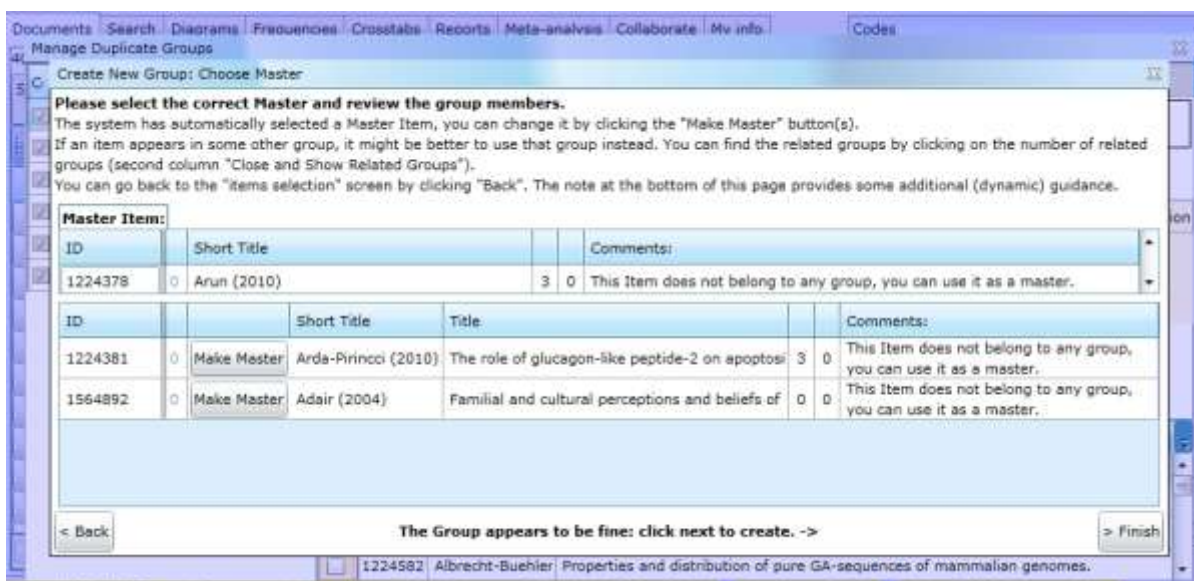
You should now decide which item should be the Master item and which items are the duplicates. The system will tell you is any of the items are already in a duplicate group. Clicking in the second column will close the window and show the related groups the item is in. You could also select the Back button at the bottom of the screen and unselect the item that is already in a group.

One you are satisfied with your selection click on the **Finish** button to create the new group. It can now be treated as any other duplicate group.

Resetting the duplicate checking

If a user has decided that what they have done while duplicate checking was all wrong and they wish to start again there is a reset option in the Manual/Advanced tab. When clicking on the Reset ling the user is presented with two options.

The first option allows you to delete all duplicate groups but still keep the information about documents already marked as duplicates. This gives you the options to re-evaluate the duplicates without losing the work that you've already done. When you **Get new duplicates** after resetting you will have a much smaller number of duplicate groups as all 'completed' duplicate groups will not appear. Overlapping groups will not appear unless further imports take place and **Get new duplicates** is then multiple times. While the system will know what items are marked as duplicates (and what items are their masters) any information but the older 'completed' duplicate groups is now lost.

To run this option you will need to enter **I agree** in the text box and then click **Yes, I confirm**.

The second option involves a complete reset of all duplicate information. Entering **Confirm** in the textbox and then clicking **Yes, Wipe All** will remove all duplicate information allowing the user to start from the beginning. There are a few scenarios where you may wish to use this form of reset:

- The Mark Automatically function was used at too low of a threshold and you have too many items marked as duplicates that shouldn't be
- You have a very large number of overlapping groups and have not yet spent too much time evaluating the groups. Resetting the will eliminate the overlapping groups. The overlap groups are created from running the **Get new duplicates** multiple times after importing new items. Running **Get new duplicates** once will not create overlap groups.

Managing linked records

It is often the case that the same study is described in two or more documents. We call these linked records or documents. EPPI-Reviewer 4 has a function to deal with this situation.

First, make a record of the ID numbers of the records you wish to link. Now pull up the citation for the first record by clicking on Go for that record on the Documents tab. This will open the Document details window.

Go to the Linked records tab that you should see near the top and over to the right. In this tab all of the records linked to the presently selected item will be displayed. To add a new link click on the **New link** button. This will open the Create / edit link window.

In the Item Id box enter the document number of the item that you want to link and click on **Get item**. This will display the Item Id, the Short title, and the Title of the item so you can confirm you have the correct ID. You can also enter a Link description if you wish. When you are finished click on **Save** and the link will be complete and displayed in the Linked records tab.

Items in the link records tab are displayed in rows. Each record can be edited by clicking on the **Edit** button. A link can be removed by clicking on the **Delete** button. The full citation can be viewed by clicking on the **View** button.

If you have uploaded a full text document, such as a pdf, to a linked item, the pdf will appear with all of items linked together.

There are different ways that a reviewer can deal with linked records. One method is to keep all of the items accessible. Any uploaded pdfs will be visible to all of the items linked together.

 Another possible method is to only keep one record per study making the study the base unit. For example, if you have 3 records or documents looking at the same study, decide which record will be the main one. You could then link the other two to this main record. As well, you could upload any pdfs for the linked documents to the main record. After this is complete, you could mark the two linked records with the exclude flag indicating that you will no longer need those records. They are still in the review but are not part of your active records.

Setting up the screening / coding tools

Coding studies is the process of examining your studies and answering a series of questions about those studies to create a database of substantive information. Whether this is the process of applying inclusion/exclusion criteria,

often called screening, or the process of carrying out a detailed data extraction, it is all considered coding in EPPI-Reviewer. To carry out coding the user must first design and create their coding tools.

Coding tools are called code sets in EPPI-Reviewer. Each code set contains a set of codes that are applied to the studies. These applied codes are used to build a database of information about your studies that can be queried in many different ways.

A code set is a hierarchal structure. At the top is the code set and below that are the lower level or child nodes. The child nodes or codes can be many different things such as questions, answers, inclusion/exclusion criteria or groups of studies.

For example, if you had a data extraction tool containing different sections part of a section may look like this:

Data extraction tool	← Code set name
Section A: Document details	← Child node ('Section A')
Has paper been published?	← Child node of 'Section A' (question)
Yes	← Child node of 'Has paper been published?' (possible answer 1)
No	← Child node of 'Has paper been published?' (possible answer 2)
Unknown (provide details)	← Child node of 'Has paper been published?' (possible answer 3)
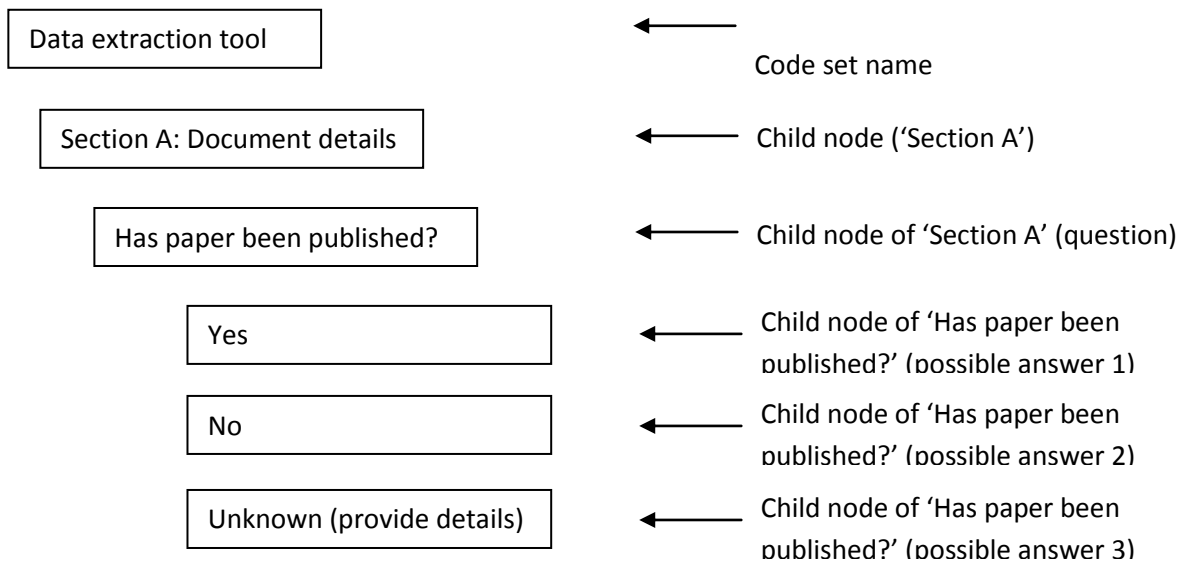
Coding tools are created in the Codes tab of the Toolbox panel. All existing coding tools are displayed and can be edited in this panel.

To create a new set of codes click on the **Create a new code set** icon at the top of the Codes tab of the Toolbox panel. This will open the Create / edit code set window.

| | You can create a new code set by clicking on the **Create new code set** icon at the top of the Codes tab of the Toolbox panel |
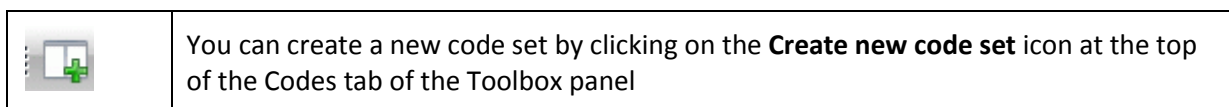
Once the 'Create / edit code set' window is you need to decide that type of codeset that you require. As shown in the diagram there are 3 codeset types available

Standard

The Standard codeset type is used for regular coding such as keywording or data-extraction. This codeset type can contain multiple levels of child codes but cannot contain the special code types 'Include' and 'Exclude'.

Screening

The screening codeset type has been designed to simplify coding comparisons that are commonly used in screening by restricting it to the code types 'Include' and 'Exclude' and only allowing one level of hierarchy. The **Screening** codeset type will be displayed in green.

Administration

The Administration codeset type is used for setting up codesets for activities such as Allocation, Retrieval and Reports. It only allows Selectable and Non-selectable code types and cannot be used for comparison coding. The **Administration** codeset type will be displayed in blue.

You also need to decide if multi-user data entry will be allowed (where two or more reviewers code the same item for quality assurance purposes. Please see Single vs. Multiple data entry for more details on multiple data entry).

	You can also display the code properties of a selected code or code set by clicking on the **Code / code set properties** icon at the top of the Codes tab of the Toolbox panel

Once the code set is created you can then add the questions and answers to it in the form of codes. To add lower level codes to a code set right click the code/code set to reveal a further options menu. Select the **Add child code** option and the Add / edit code window will appear. For a lower level code (child node) you can edit the name, provide a description and choose the code type.

If you are using the **Screening** codeset type you will only be able to select **Exclude** or **Include** code types. The **Exclude** or **Include** code types will display a checkbox next to the code.
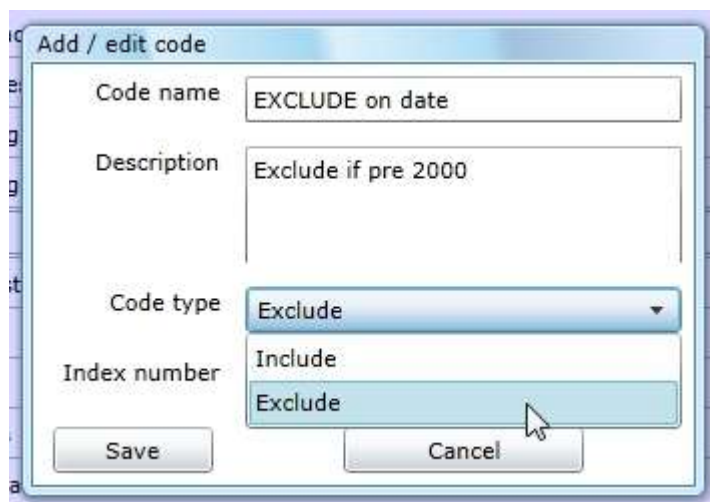
If you are using the Standard codeset type there will be a number of code types are available. If you wish to display a checkbox with the code you should choose **Selectable (show checkbox)**. To enter outcome data you could choose **Outcome**.
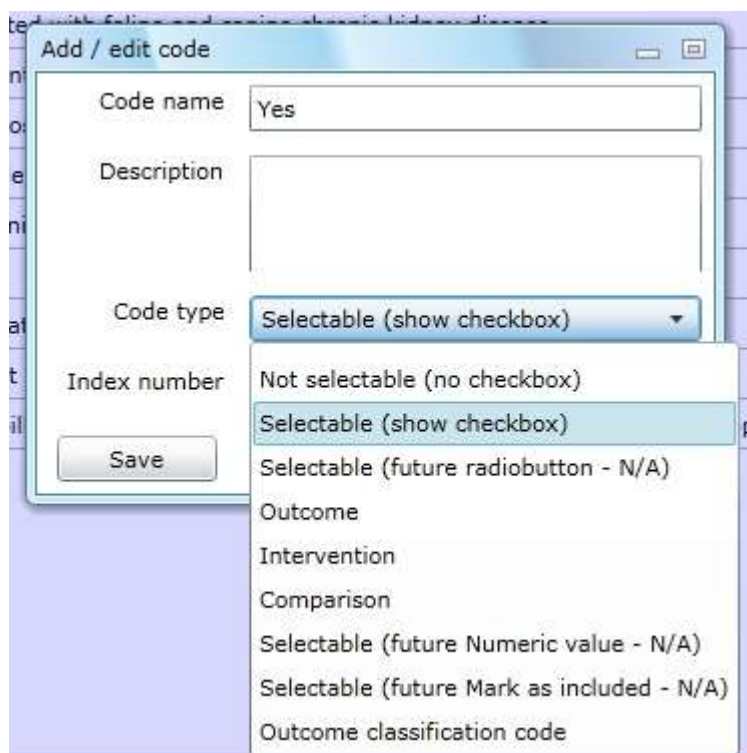
When the example from the beginning of this section is assembled in EPPI-Reviewer 4 in the codes tab it would look like this:
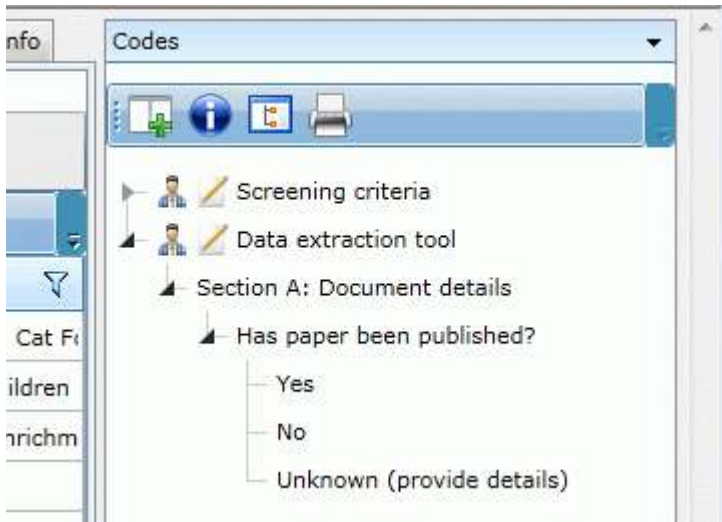
Moving Codesets and Codes

You can drag and drop codesets and codes to reorganize your coding tools and codes.

To move a codeset left click the codeset and drag it to where you want it to be. The system will not allow a codeset to get dropped into another codeset.
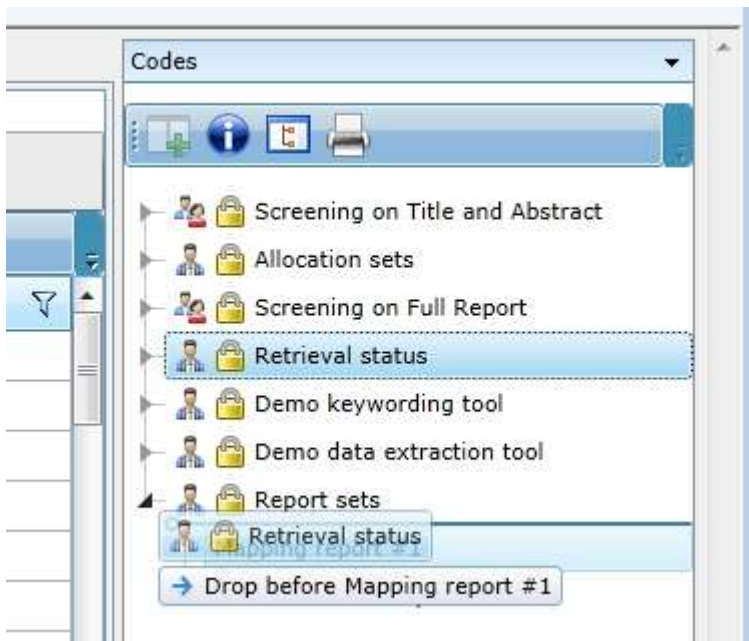
To move a code left click the code and drag it to where you want it to be. You can move the codes to different levels of hierarchy within the codeset. The system will not allow you to move a code to a new codeset.
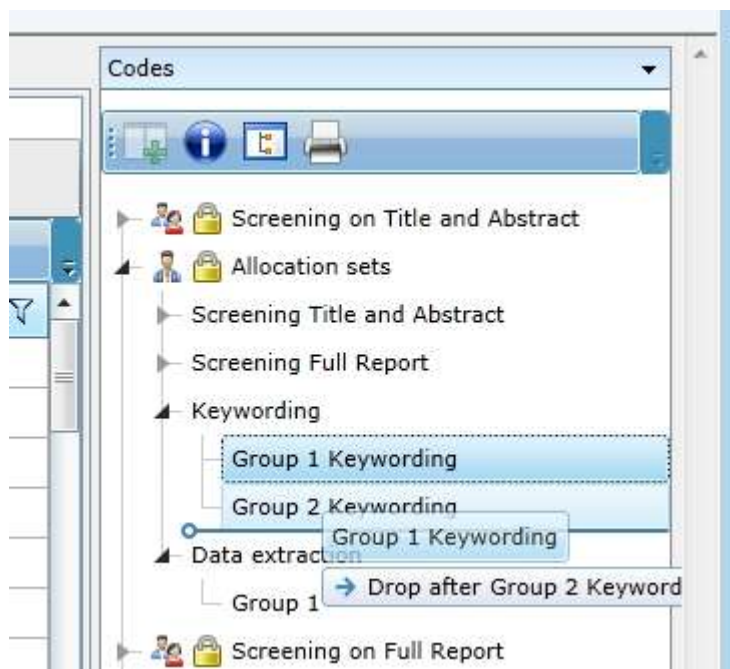
You can have multiple levels in a code set. You can have multiple codes sets in a review.

> Although there is no limit on the depth of hierarchy in a codeset, having more than 4 levels can become cumbersome due to the width of the tool and having to expand many levels to find a particular code.

Copying and pasting codes

Different questions in a coding tool will often present the user with the same possible responses. Rather than individually creating a number of similar codes the copy and paste functions will allow you to copy sections of your coding tool as needed.

The copy and paste function will copy the selected code and all of its child codes. The steps to follow would be:

1.   Select the level you wish to copy

2.   Right-click and select **Copy**
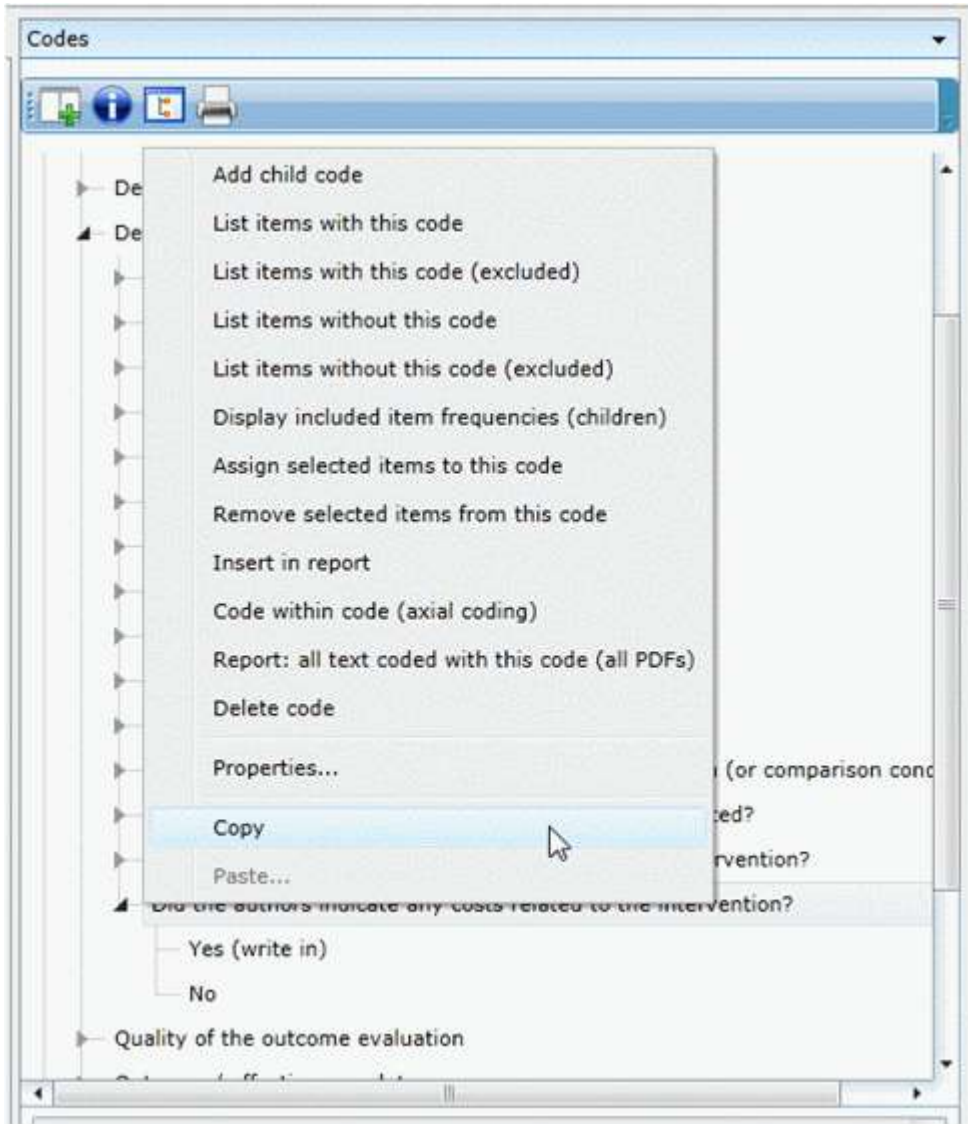
3.   The selected code and all codes below that level will be placed in the clip-board

4.   Select the position where you want to copy your codes

5.   Right-click and select **Paste…**
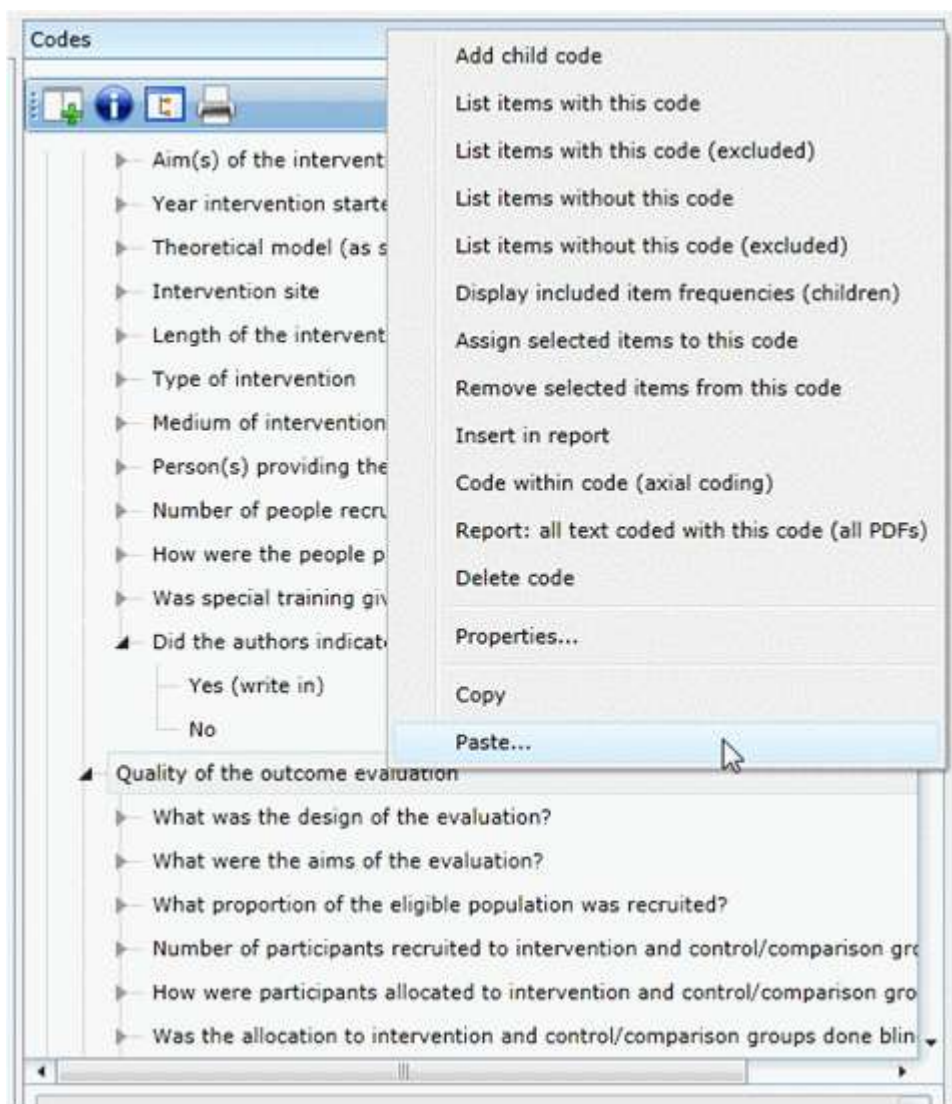
6.   The pasted section will be placed at the bottom of the level selected

You can copy individual codes or you can copy sections of the coding tool.

For example, if you wanted to copy some codes named 'yes', no' and 'unknown' you could copy the individual codes one at a time. But if you select their parent you can include all of those codes in the copy operation. If you copy all of them at once (including the parent code) you just need to edit the pasted parent code to represent your new question.

Copying codesets across and within reviews

If you are carrying out multiple reviews and need to use the same codeset in more than one review, or just wish make a copy of an existing codeset in the same review you can use the codeset copy utility.

The codeset copy utility can be found in **EPPI-Reviewer 4 account and review manager** that can be found on the **EPPI-Reviewer 4 gateway**. You will find it under **Utilities / Codesets**.

The process to follow is:

1.   Select the source review
2.   Select a codeset from the source review
3.   Select a destination review. This can be the same as the source review if required.
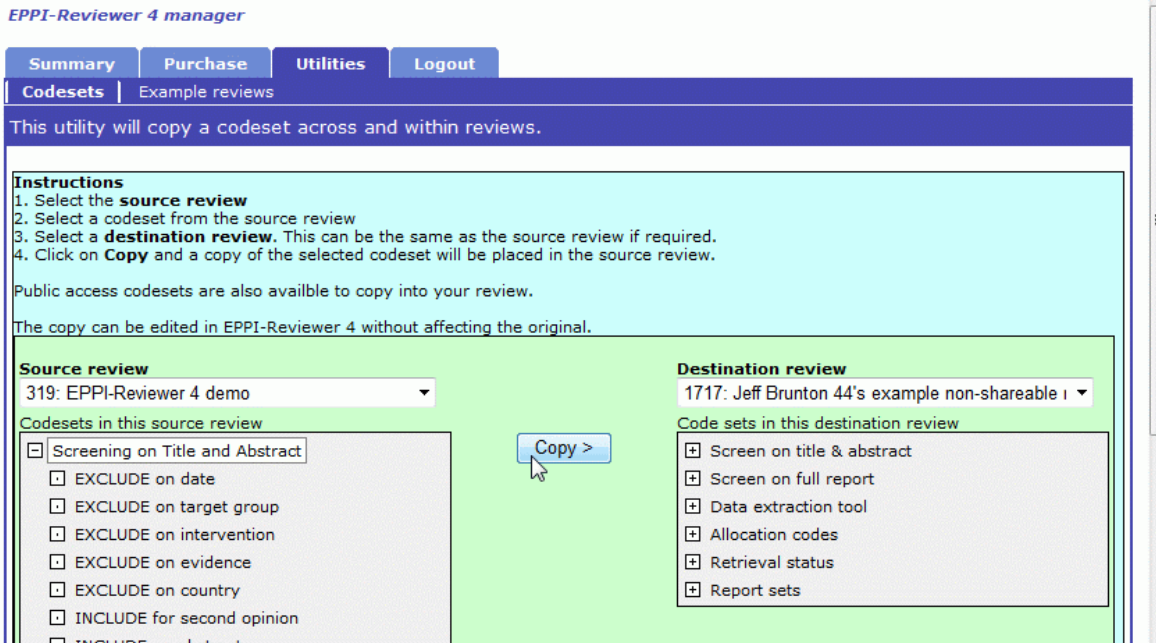
4. Click on **Copy** and a copy of the selected codeset will be placed in the source review.

Coding references or documents

Coding studies is the process of examining your studies and answering a series of questions about those studies to create a database of substantive information. Each of these questions and possible answers are codes that the user creates when assembling their coding tools.

Screening references

Reference screening in EPPI-Reviewer 4 is treated as just another form of coding. Exclusion / Inclusion criteria are set up in the system as a series of codes to be applied to the references. The user then applies the criteria to each reference.

The software allows the user to carry out both 'single' and 'double' screening. Single screening is where a single user applies the screening criteria to a reference. Double screening is where two users apply the screening criteria to the same reference and then compare and reconcile their disagreements.

A popular function to assist in screening is **Key term** highlighting. This function will allow you to highlight in green terms that are relevant and highlight in red terms that are not relevant. You can find more information about this under Key term highlighting.

Applying codes to a reference or document

Items can be coded individually or in batches. The items to code are accessed through the Documents tab of the Home panel.

To code one study at a time select a reference from the Documents tab by clicking on the **Go** button next to the item. The document is now displayed in the **Documents details** window. The document is displayed on the right

hand side while any created codes sets are displayed on the left hand side. Expand the relevant code set on the left hand side.

Using the same example as before the code set in the Document details would appear as:
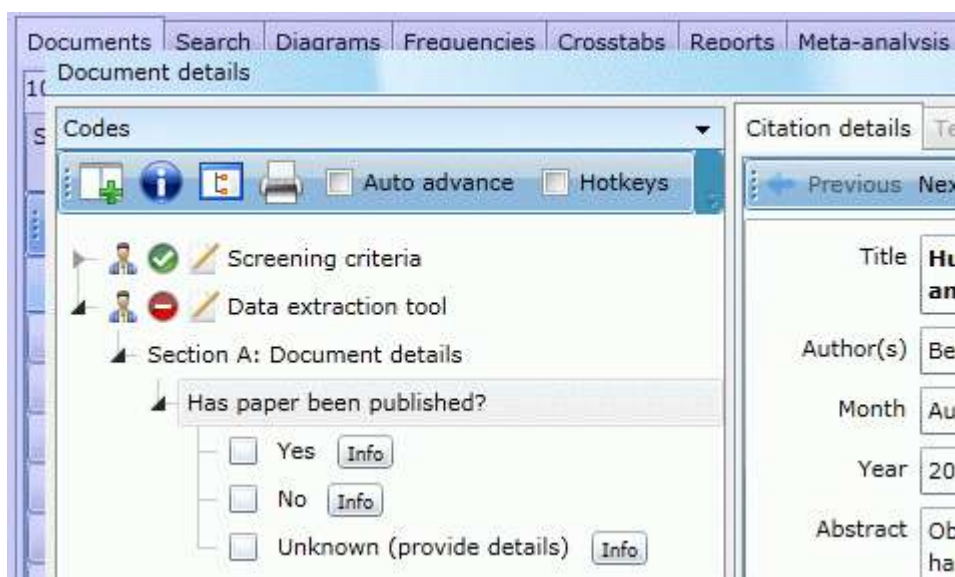
Depending on the code type you should then select an answer or add information to the code relevant to the document displayed. Clicking on a checkbox will select the answer and automatically save the selection.

Auto advance and Hotkeys

To assist in the screening process there are **Auto-advance** and **Hotkey** functions available.

If you turn auto advance on, by selecting the checkbox next to **Auto advance**, the system will advance to the next item automatically each time you check a code in a coding tool. This will reduce the number of clicks required to code an item.

The Hotkey function has been added to remove the need to use a mouse when coding. This might be helpful to reviewers who have RSI (Repetitive Strain Injury) from using a mouse too often. You can turn on Hotkeys by selecting the checkbox next to **Hotkeys**. If you then select the codeset or a code in the codeset a number will appear next to the immediate child codes of your selection.
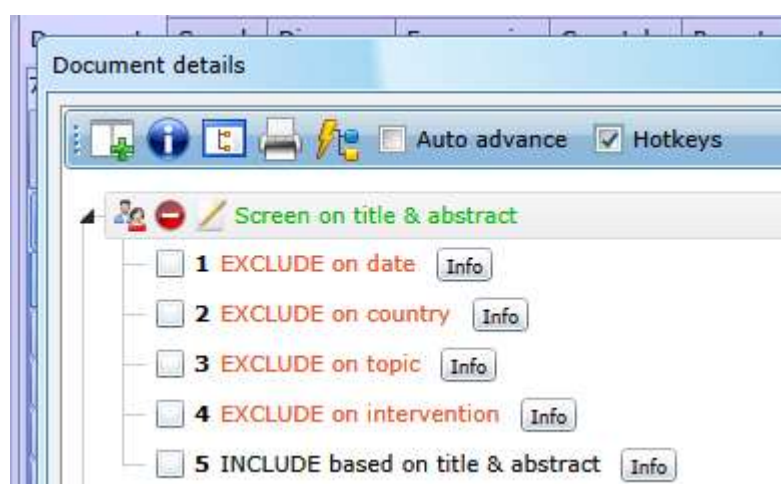
You can now select the code by typing Ctrl-shift and the number.

You can combine Auto advance and Hotkeys to make the process even quicker.

Adding text to a coded response

If the code has a checkbox visible there will also be a button labelled **Info**. Clicking on this button will open up a window for entering a text response to the question. Enter your response and then click **Save**.
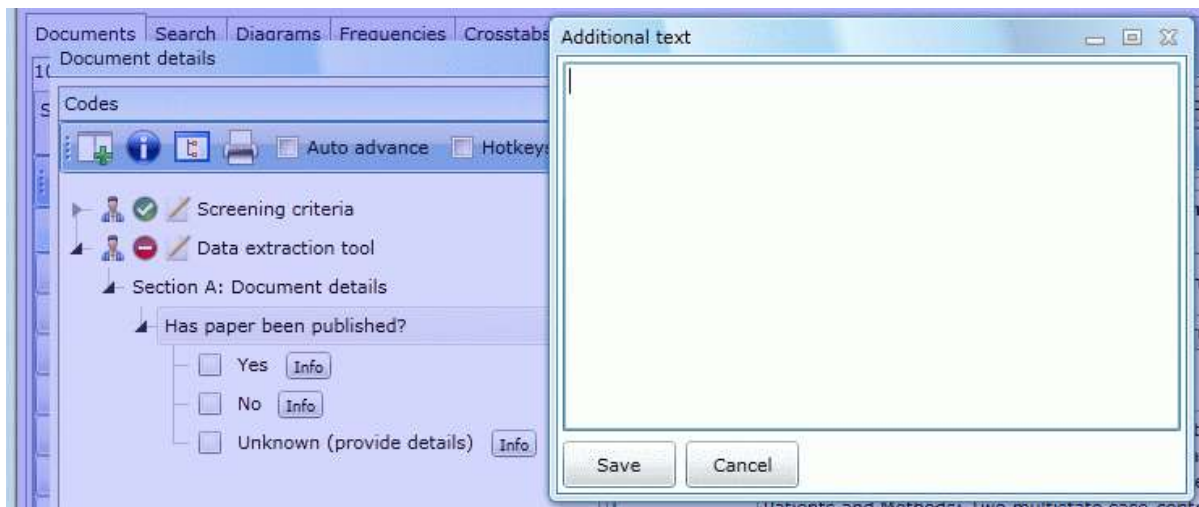
When you are finished applying your codes to the document click on **Next** or **Previous** at the top of the Citation details tab to move to a new document.
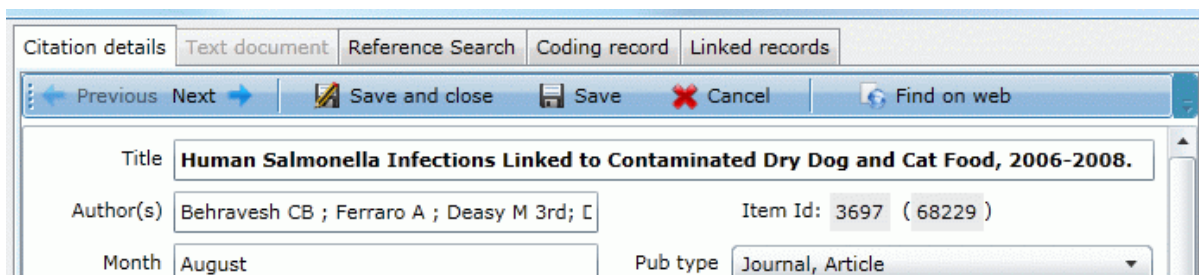
To code items by batch display the documents to code in the documents tab of the home panel. The documents can be listed in many ways such as the result of a search, or by source or by previously assigned codes or by selecting individual items. Once listed, select the code to apply to the documents from the Codes tab of the Toolbox panel by left clicking it. Now right click on the code and select **Assign selected items to this code**. Select **Yes** from the confirmation window and the selected code will be applied to all of the selected items. Codes can be removed from selected items in the same manner.
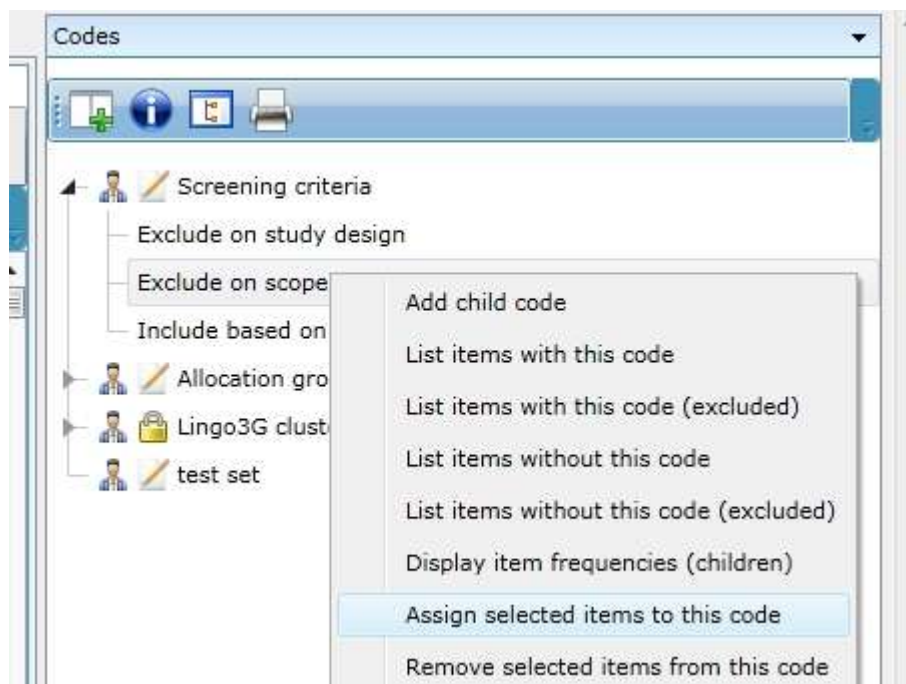
Coding complete vs. coding not complete

For an item's coding to be available for reports or searches the item must be marked as complete. The complete or not complete status is code-set specific so an item could be marked as complete with respect to one code-set but not complete with respect to another.

Applying a code to an item will automatically mark it as complete except when multiple coding (i.e. two or more users coding the same item) is being carried out. Please see the section on Normal vs. Comparison data entry for details.

You can tell if an item is marked as complete based on icon next to the code set.

If the icon is a red disc, the item is not complete. A green disc with a checkmark indicates the item is marked as complete.

	The **Coding not complete** icon (red disc) indicates that coding for this item is not finalised. Items with codes not finalised will not appear in reports or searches.

	The **Coding complete** icon (green disc) indicates that coding for this item is finalized. Items with finalised codes will appear in reports and searches.

To manually mark an item as complete left-click on the red disk. The coding complete window will appear allowing the user to mark the item as complete.

To manually mark an item as incomplete, open the code set properties window by either clicking on the code set properties icon or right clicking on the code set and selecting properties. Uncheck the **Coding complete** checkbox and then click on **Save**.
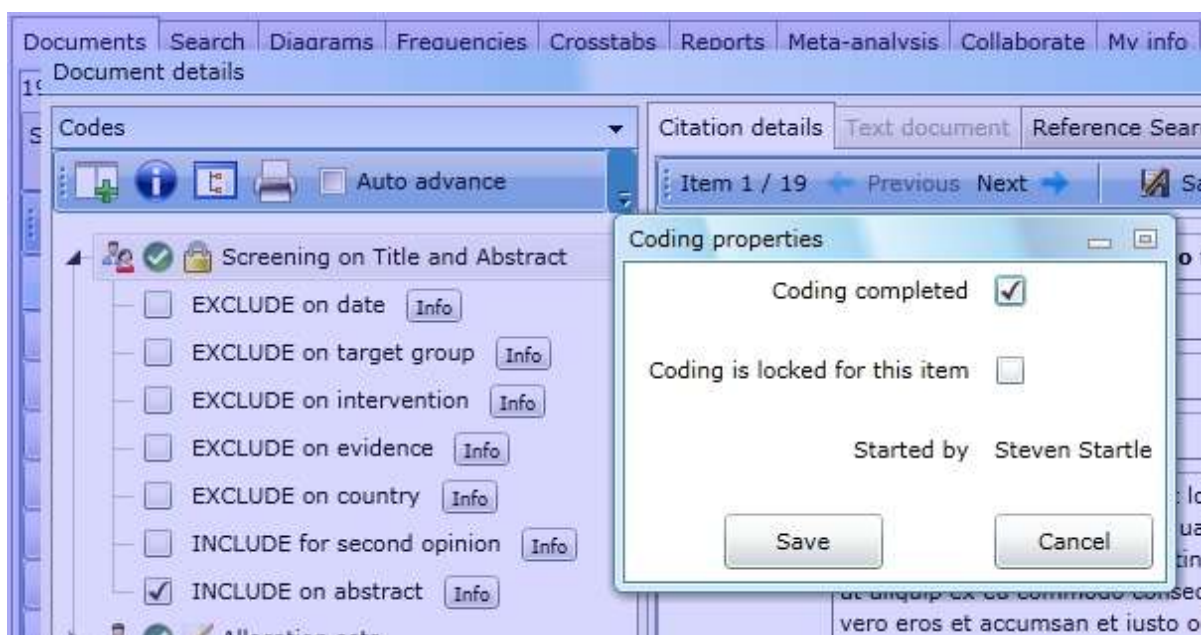
Normal vs. Comparison data entry (formally single vs. multiple)

EPPI-Reviewer supports **Normal** data entry/coding and **Comparison** data entry/coding. This was previously known in EPPI-Reviewer as **single data entry** and **multiple data entry data** entry but has been renamed to more closely reflect its purpose and behaviour.

Normal data entry is when you are applying codes to items.

Comparison data entry is when two or more reviewers are coding the same item independently and will then compare their work to identify agreements and disagreements. This is often called double coding or double screening.

Changing between normal and comparison data entry

Normal and comparison data entry are properties of the codeset. When a codeset is changed from normal data entry to comparison data entry (or vice versa) the process of coding documents changes accordingly.

When a codeset is set for **Normal** data entry, any code applied to an item using a code from that codeset will mark the item as 'complete'. The codeset will display a green disc on the Document details page for that item (see figure

below). If an item is marked as complete for a particular codeset, then the coding for that item becomes visible to the programs searching and reporting functions.
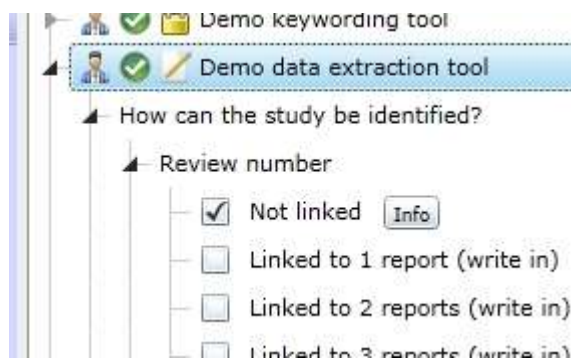
When a codeset is set for **Comparison** data entry the assumption is that multiple users will be coding the same item using the codeset that is set for comparison coding. When a code is applied to the item the item is **not** marked as complete. The codeset will display a red disc on the Document details page for that item (see figure below). It is expected that the coders will need to compare their coding selections and reconcile their differences before marking the item as complete.
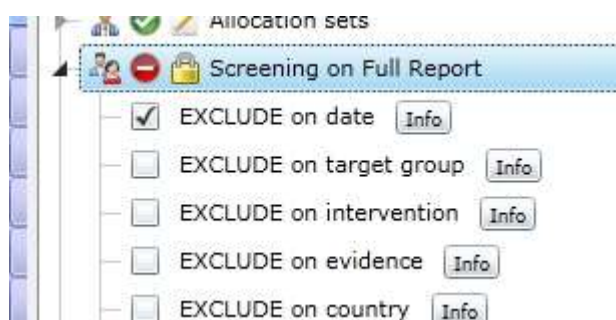
Codesets should normally be set for normal data entry and only changed to comparison data entry if the user intends to double code/screen (or triple code/screen) items.

Changing from normal data entry to comparison data entry

Normal data entry and comparison data entry are properties of a codeset. If you wish to change that property you can right-click the codeset and select **Properties**. This will open the **Edit codeset** window where you can click on the **Change to comparison data entry** link.

 If a user tries to change a codeset from normal coding to comparison data entry they will get a warning telling them that Comparion coding implies that multiple users will be coding the same item using the codeset that is being changed.

If Comparison data entry is to be used the reviewers should expect to compare results, reconcile the disagreements, and mark the agreed version as complete.

Changing from Comparison data entry to Normal data entry

If a user tries to change a codeset from Comparison data entry to Normal data entry and all of the multiple coded items have been reconciled and marked as complete, then the system will tell the user there are no conflicts and that it is safe to proceed (see figure below). Once returned to single data entry any further coding carried out, whether on new items or previously coded items, will behave as expected under normal data entry.
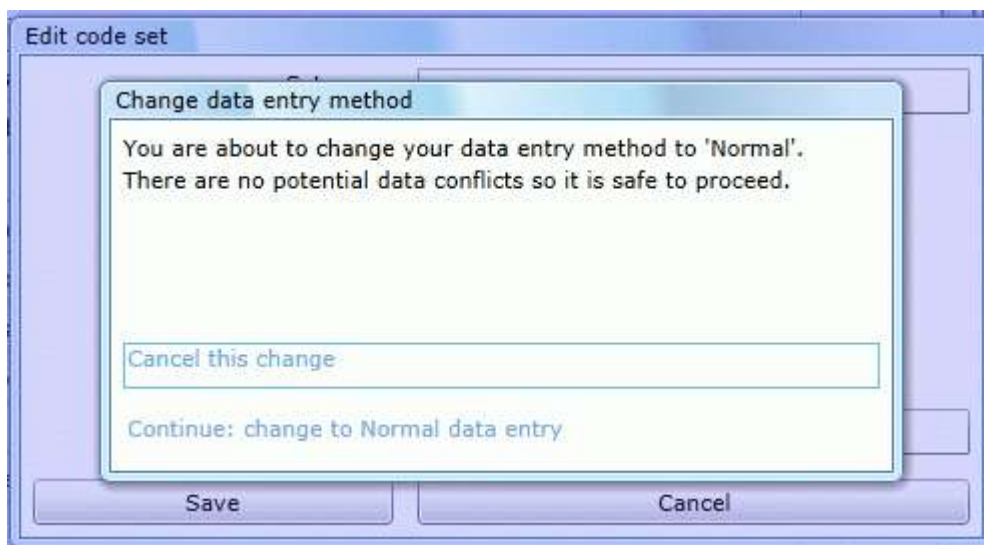
If a user tries to change a codeset from Comparison data entry to Normal data entry and there are items that are not marked as complete the system will put up a warning message (see figure below). The default selection is to cancel the operation so the reviewer can 'complete' the items that need completing.
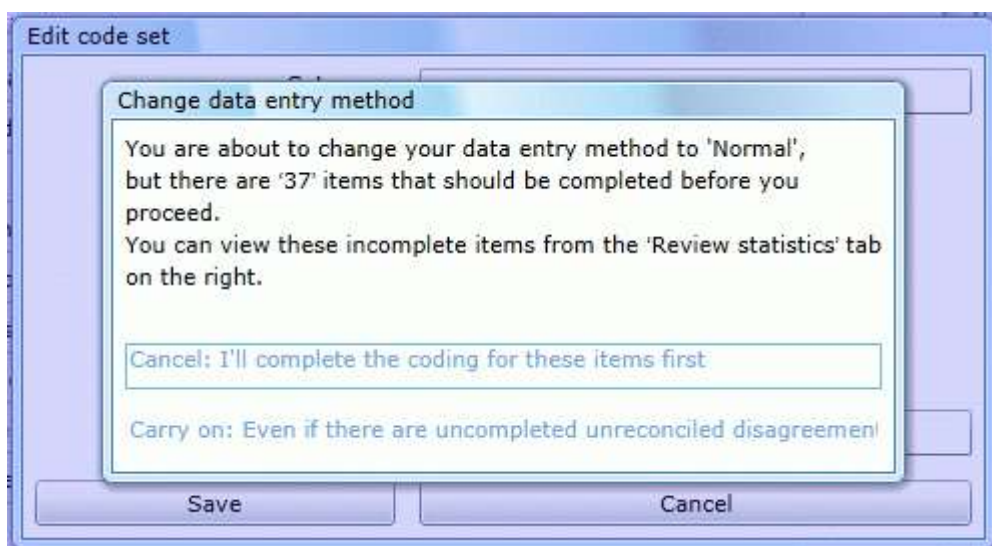
These items can be identified in the Review statistics tab in the toolbox panel. A breakdown of the number of incomplete items is listed and the coders associated with them. If the user clicks on the number, the items will be displayed in the Documents tab.

If the user clicks on the green checkmark they can bulk complete the items. A warning will be displayed as bulk completing can have implications. For example, if the items you are bulk completing have been double coded and you select a coder whose selection of codes was 'incorrect' (i.e. not the best selection of codes) you could be completing items using 'incorrect' codes. If you are confident that a particular coder's selection of codes is correct, then bulk completing the items using this method is an appropriate method.

If the user chooses to proceed and not complete the items by clicking on '**Carry on: Even if there are uncompleted unreconciled disagreements'** in the warning window they may end up having coded but not completed items. The coding for these items will not show up in searches and reports as the item is not marked as complete. If you look at the coding in the Document details window the user will only see their own coding for those items. If they apply further codes to those items, using the changed codeset, the items will remain un-completed. The items will need to be manually completed by opening the properties window for the codeset and checking the **Coding completed** option or by using the bulk coding function in the Review statistics tab.

Allocating references for coding

References to be coded can be allocated or assigned to individuals in a number of different ways. The system can help manage the coding process but telling the users what code set to apply, to which items to apply it, what has been coded and what still needs to be code.

Random allocation

To create groups of randomly selected items for allocation go to the Codes tab of the Toolbox panel. Create a new code set, chose a codeset type of **Administration** and give it a name such as 'Allocation groups' to indicate it will contain the allocated items. Now click on the icon labelled **Assign documents to specified codes randomly** that is at the top of the Documents tab of the Home panel.

	For allocation you can randomly assign documents to a code set by clicking on the **Assign documents to specified codes randomly** icon at the top of the Documents tab.

The 'Allocated items to codes randomly' window will appear.
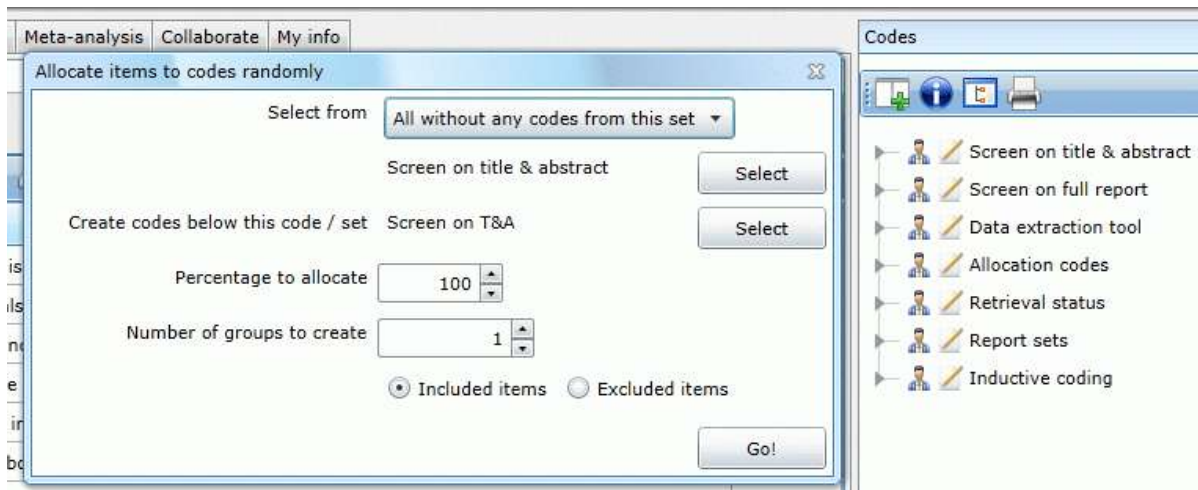
Choose an option from the 'Select from' drop down menu. To allocate all items not already coded by a particular code set choose 'all without any codes from this set' and select the code set. For the 'Create codes below this code option you should select the code set that was just create. Finally select the number of groups to create and the percentage of items to allocate. The number of groups will normally be the number of reviewers that will be coding items. If you are double coding the number of groups will normally be half the number of reviewers that will be coding items. Select **Go!** to register the choices and to close the window. In the recently created code set new child nodes, named Group 1, Group 2, etc. will now exist. The number of child nodes will match the number of group you created. The total number of all items across all groups will total the percentage of items allocated.
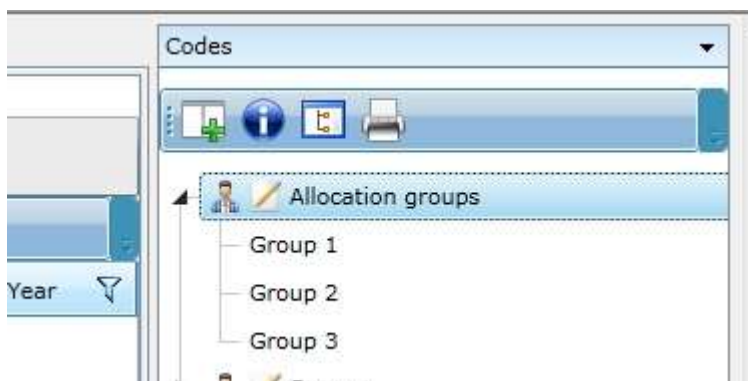
If you select and right click on one of the child codes, say Group 1, and choose **List items with this code** the randomly selected items will be listed in the Documents tab of the Home panel. All of those items have been assigned the Group 1 code.

Now that the items have been placed in groups, the groups can be assigned to individuals. There are a couple of ways to do this. You could just rename the groups to match the individuals who will be doing the coding by selecting the code and pulling up the code / code set properties window.

Setting up coding allocations

If you wish to assign the new groups of random documents to individuals and let the system keep track of what code set to apply and what has been coded, go to the Collaborate tab of the Home panel.
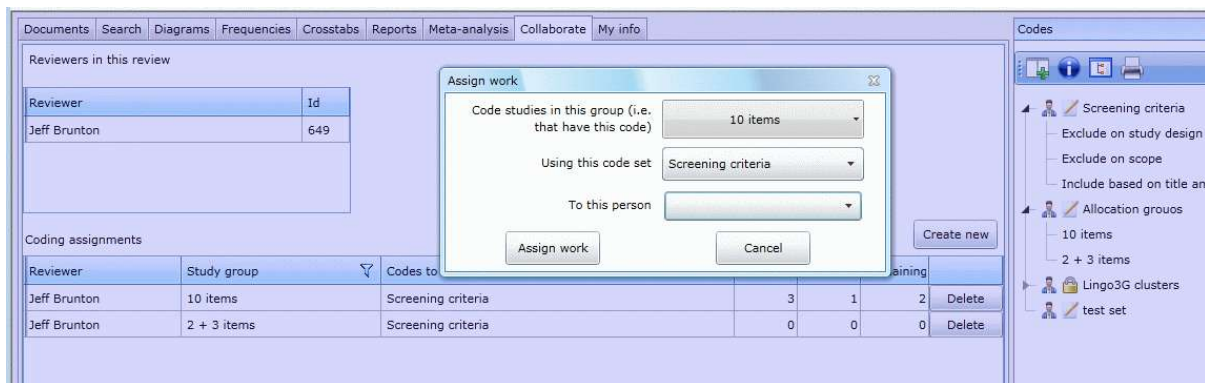
Click on the **Create new** button and the assign work box will appear. From the first drop down menu select the code that contains the items that will be coded. This would be the Group 1, Group 2, etc. nodes that we created previously. From the next dropdown menu select the codeset that will be applied to the allocated items. Finally, select the person to allocate the items to by using the third dropdown menu.

Since the allocation process uses items assigned to a code you can use any group of items when allocating. If you need to allocated items to individuals based on previous coding, you just need to select that previous coding for 'Code studies in this group' when setting up the allocation.

Now click on Assign work button. The assignment will be listed in the Coding assignments table.

Allocating items for double/multiple coding

For quality assurance items are often double (or even triple) coded. Double coding means a code set may be applied twice times to an item by different reviewers. This is often called double screening or double data-extraction depending on the purpose of the codeset.

If double coding is to be used, repeat the steps for allocation, as described above in the allocation instructions, but rather than allocating a different group of items to each reviewer, use the same items for each reviewer. After clicking on **Assign work** for the first reviewer, change the reviewers name and click on **Assign work** again.

Be sure to check that the Codeset that will be used for double coding (ex. the screening codeset) is set to **Comparison** data entry. A codeset that is set for Comparison data entry has the two-person icon displayed next to it.

	Codesets set for **Comparison** data entry have a two-person icon displayed.
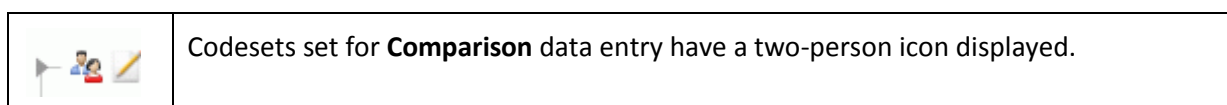
You can also change or check the this property by right-clicking the code set, displaying the properties for that set and editing the properties accordingly.

Coding by allocated references

Normal coding

If the items to be coded have been allocated to a single reviewer the user must be sure they are accessing the correct items. Select the My Info tab of the Home panel. The allocated coding tasks are listed in the 'My work allocation in this review' table.

| My work allocations: | | | | |
Codes to apply:	Group of studies	Allocated	Started	Remaining
Screen on title and abstract	Group 1	51	46	5
Screen on title and abstract	Group 2	51	29	22
Data extraction tool	Group 1	51	4	47
Screen on title and abstract	All items	3009	135	2874

Find the row in the table for the task you are going to work on and click in the cell of the column labelled **Remaining**. The Documents tab will appear listing the allocated items that have not yet been coded in the selected allocation. Select the first item in the list by to open the Documents details window. Move through the items applying the codes. As it is single coding, the items will be automatically marked as Complete when a code is applied. The list of items assigned to an individual for coding can also be found in the Collaborate tab.

Comparison coding

If the items to be coded have been allocated to a code-set set up for **Comparison** coding the reviewer will still access their items in the My info tab. The items for coding can also be accesses on the Collaborate tab by clicking in the cell of the **Allocated** and **Started** column of the 'My work allocation in this review' table.

Please note that when carrying out **Comparison** data entry, the item is not marked as **Complete** until reconciling has been carried out. This means that if you run searches or reports on those items based on their coding, the codings will not appear until the Agreements are marked as complete and the Disagreements are reconciled and marked as complete.

Comparison and reconciling of Comparison coded items

If Comparison data entry has been carried out the reviewers will want to compare coding and reconcile the differences.

Go to the Collaborate tab of the Home panel. The allocations are displayed on in this panel. Click on the button labelled **Create comparison** to bring up the **Create comparison record** window. Select the name of Reviewer 1 and Reviewer 2 and the code set to compare. To restrict the comparison to a particular group of items (such as the ones that you just coded) select the code that will identify those items in the Codes tab and then click on **Set Attribute (optional)**.

Now click on the **Create Comparison** button in the window to run the comparison and create a new row in the comparison table.

From this new comparison row you can generate a 'Quick report' of the coding by clicking on the **Run** button for the new table row. Clicking on **Run** will bring up the Quick comparison report window. Select the code set to compare from the Codes panel (the code set used to carry out the coding), click on **Select this code (set)** button and then click on the **Run** button in the window.

An html window will pop up containing the report. This report shows how each reviewer coded each document and the agreed version if any items have been reconciled at this point. Since this window is in html, the contents can be cut and pasted into most word processing or spreadsheet software such as Word or Excel.

To view the statistics on the coding and reconcile the agreements click on the **View** button in the Stats column. This will bring up the **Comparison statistics** window. The number of items coded for each reviewer is listed along with the number of agreements and disagreements. Clicking on the **list** button for either agreements or disagreements will pull up those items in the Documents tab.

There may be two tabs in this window labelled **Full** and **Include/Exclude Only**. The Full tab will calculate the number of agreements and disagreements based on any differences between the different coders.

The **Include/Exclude Only** tab is available when you are running a comparison that uses the screening codeset type.
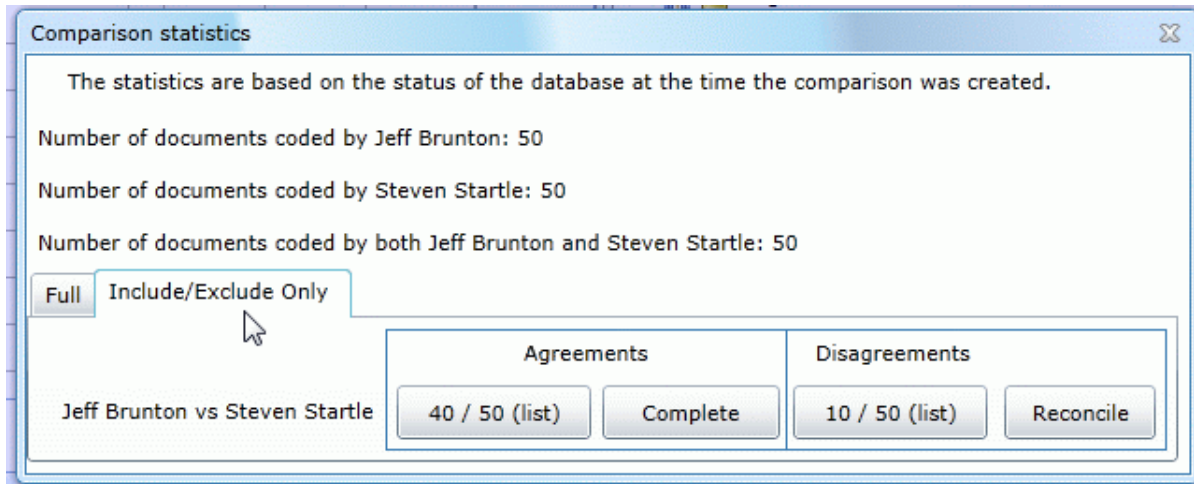
This comparison will calculate the number of agreements and disagreements by grouping all of the exclude codes and the include codes. The different scenarios of agreements or disagreements are as described below:

- If each coder has assigned an exclude code it will be called an agreement even if they were different exclude codes.
- If each coder has assigned an include code it will be called an agreement even if they were different include codes.
- If each coder has assigned an include and exclude code then it will be an agreement as each coder has done the same thing.
- A disagreement is when you have an exclude code versus an include code. This would also apply if one coder assigned an include and exclude code while the other only assigned either an include or exclude code.

Note that when you run Create comparison you are creating a snap-shot of the status of your database for a particular point in time. If you code more items, the comparison will not change. You will need to create a new comparison to see any changes.

Dealing with agreements

Before marking all of the agreements as completed you might wish to run and save a quick report of the existing coding. Reconciling double coding means that one of the coders will be holding the agreed version. This agreed version will overwrite the existing coding for that user. If you wish to present the original coding along with the agreed version, you will need to save off a copy beforehand.

To place all of the agreements under one account open the comparison statistics window by clicking on the View button in the stats column.
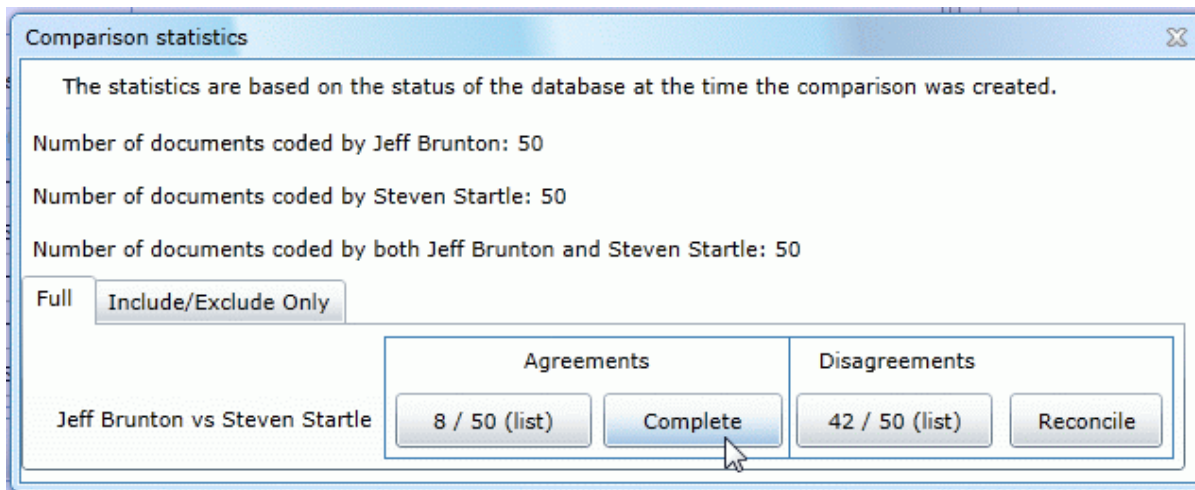
In the Comparison statistics window click on the **Complete** button to open the **Complete agreed coding** window. Select the user account from the dropdown menu that will hold the agreed versions and click on **Go!**
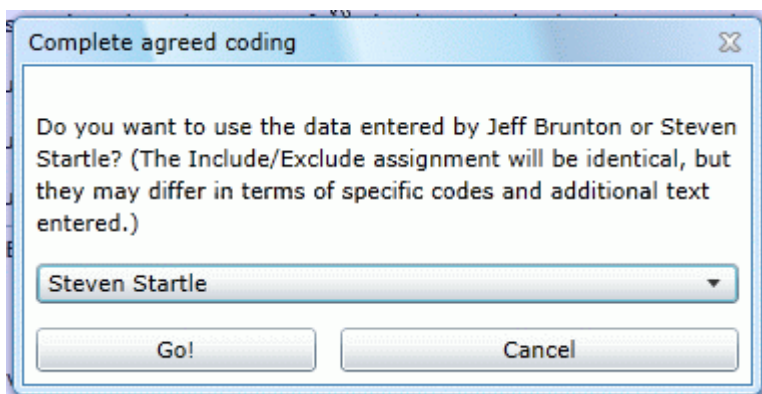
Although there is no requirement for one account to hold all of the agreed versions, it might be easier to keep track of your process if this was the case.

It is important to remember that while the coding may be in agreement between two users any textual response may be different. If textural responses have been given the user may wish to compare the responses using the 'Quick report' function.

Once you click on **Go!** the items will be marked as Coding complete..

Dealing with disagreements

There are a number of different ways to compare and reconcile the disagreements depending on the complexity of your coding tool. For coding tools that have many levels of hierarchy and contain a large amount of textual input then it would be expected that almost all items would be disagreements. In this situation the reviewer may prefer to make comparisons using the **View comparison** options in the **Coding record** tab (see further down in this section for details).

For most coding tools, such as screening tools or tools with two or possible three levels of hierarchy, then the Comparison reconciliation screen is the preferred method dealing with disagreements.

This screen can be access by clicking on the **Reconcile** button in the Comparison statistics window.
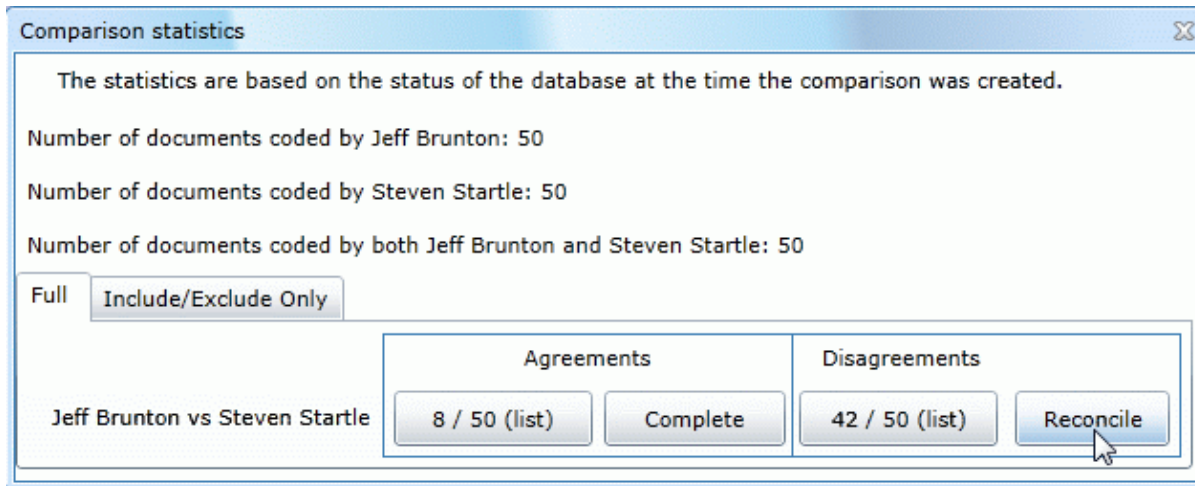
The Comparison Reconciliation screen will display the items that are listed as disagreements. Each reviewers work is displayed in a column and each row represents an item. The codes selected by each review are displayed as text boxes on the screen.
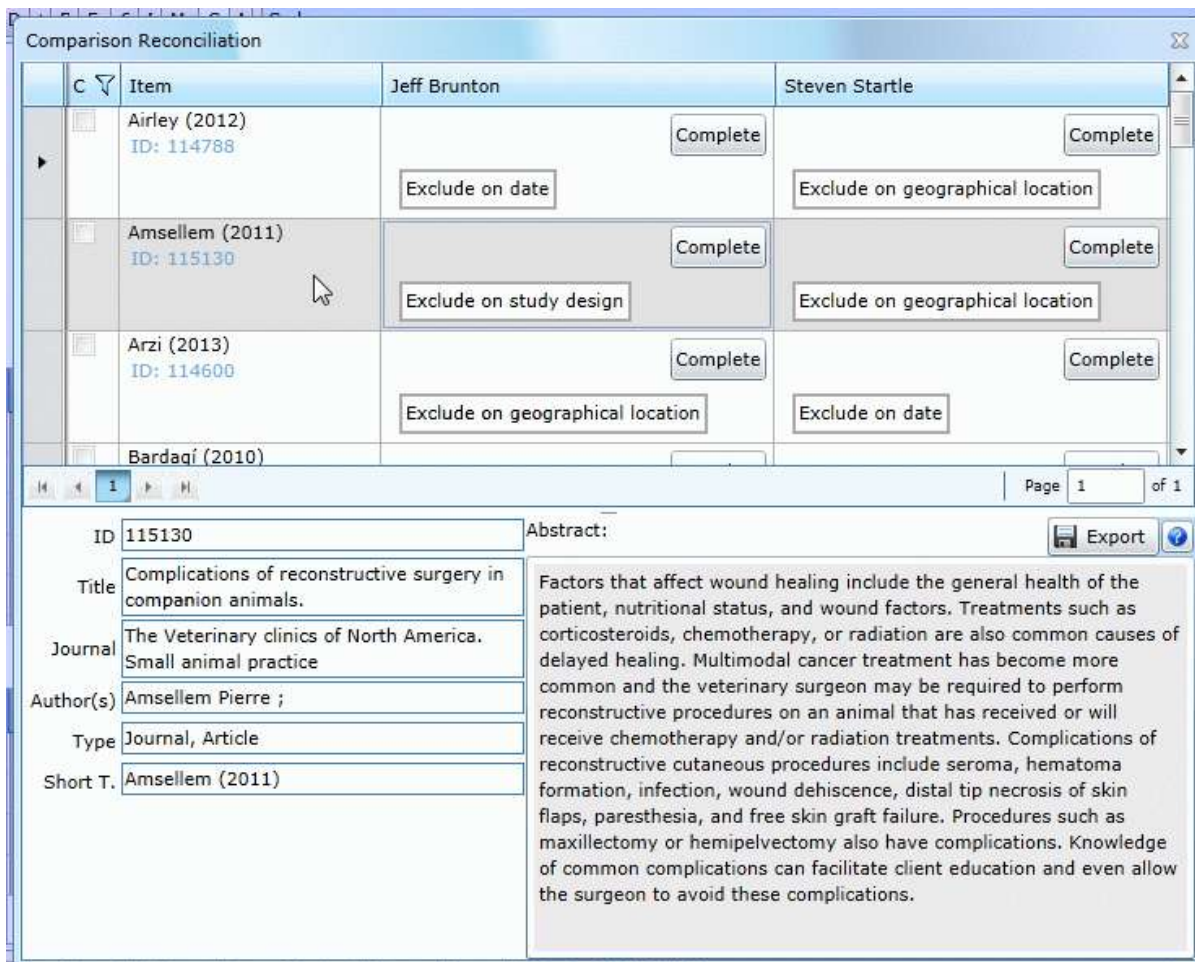
When you select a row the row is highlighted and the citation details are listed at the bottom of the screen. If a pdf has been uploaded it can be accessed as well.

The person reconciling the disagreements can see the codes that each reviewer selected. Once a agreed version is chosen the item can be completed by clicking on the **Complete** button that exists in each column for each item. If

you click the **Complete** button for the first reviewer then it will be first reviewers version of the coding that is the agreed/completed version.

The green check in that cell will indicate which reviewers coding is the agreed version. As well, once an item is completed the checkbox on the left side of the row will be marked.

This method of completing items will allow a third person to carry out the operation by selecting coding other than their own as the agreed version.

To un-complete an item you can click the **Un-Complete** button that appears in the second column.

As each item is completed the row will turn green to help the reviewer identify the items that still need to be completed.

If you are reconciling many items you can page what is displayed on the screen. The number of items in the page is tied to the number of items in a page in the Document details window. To keep the page fast and responsive you might wish to lower the value from the default value of 700.

If you need to go to the actual citation in the Document details window you can click on the ID link just below the Author(Year) data that can be found in each row.
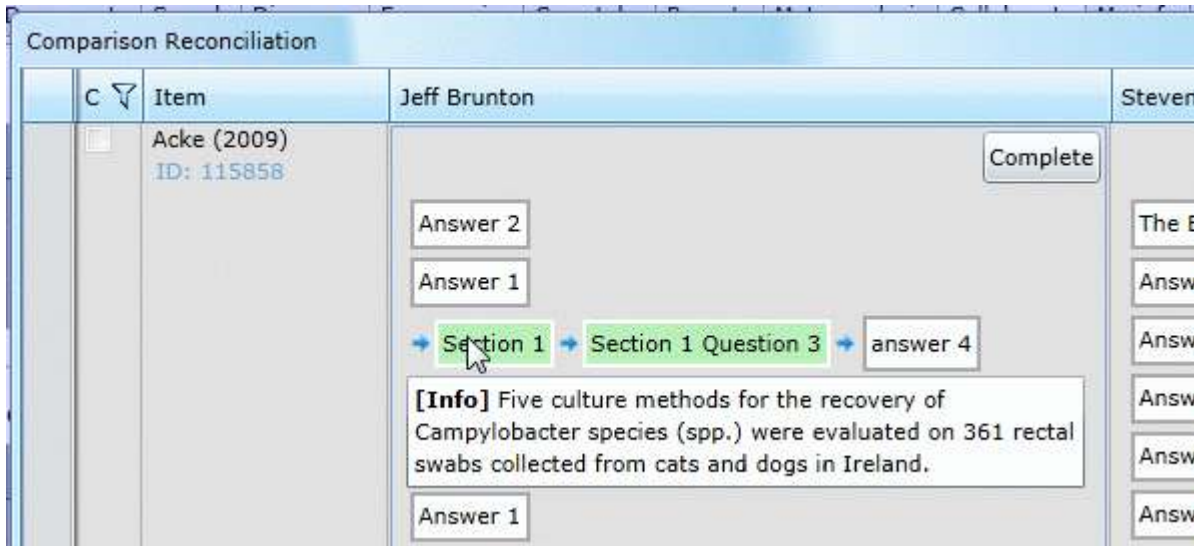
If your coding tool has more than one level of hierarchy you can display the full path by clicking on the code that is displayed. Each parent code up to the root level will be shown.

If any text has been entered in the Info box while coding, that text will also be displayed if you click on the code.

For comparisons using more complex coding tools you may prefer to use the **Run comparison** or **Live comparison** in the **Coding record** tab. With the Comparison statistics window open click on the list button for the disagreements.
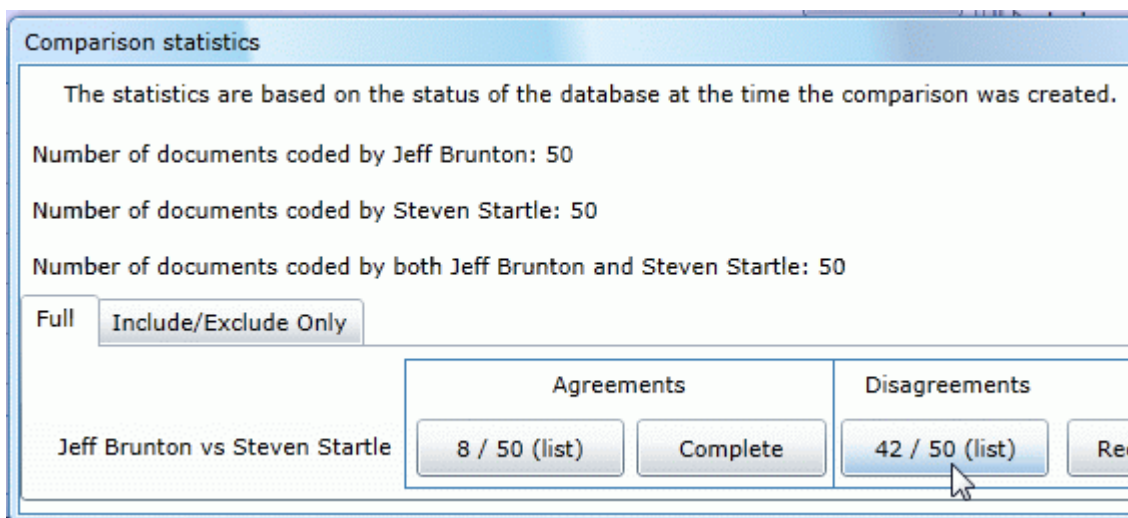
The disagreements are then listed in the Documents tab. Select the first document to open the Documents details window by clicking on the **Go** button on the left.

 You should now be in the Documents details window. Select the 'Coding record' tab on the right hand side of the screen. The reviewers who have coded the item across all codesets will be listed.

To compare the coding of an individual item select the **Run comparison** button after selecting the coders to compare. This will present the choices of the different coders for the particular item in a popup window.

To compare the coding on each item click on the **Live comparison** button. Now change to the Citation details tab so you can move through the items. Finally, click on the code set on the left side of the screen bring up the live comparisons.

At the bottom of the screen, under the citation details box, the codings for each reviewer in the comparison will be displayed.

The code selections displayed on the left side of the screen in the code treeview are your own selections (assuming you have logged in using your own account). You can edit these choices based on the comparison data displayed below the citation box.

When you have made your agreed selection (i.e. reconcile the item) you need to mark the item as complete. A **Coding not complete** item has the red disc displayed next to it. If you click on this disk a Coding complete window will appear where you can select OK to mark it as complete. The item should now have a green disc next to it; the **Coding complete** icon.

	The **Coding not complete** icon indicates that coding for this item is not finalised. Items with codes not finalised will not appear in reports or searches.

	The **Coding complete** icon indicates that coding for this item is finalized. Items with finalised codes will appear in reports and searches.

The user can now move through each item by clicking on the next or previous button at the top of the citation details box.

An important point to remember when marking an item as complete is that the coding of the person marking the items as complete becomes the completed coding. Always make sure your coding is correct before you mark the item as complete. If someone else comes along later, edits the coding and marks it as complete, then their coding becomes the completed coding.

Coding only interface

The 'Coding only' interface is designed to simplify your coding tasks by using your coding allocations to direct your work in an optimised interface. It also allows true double blind coding / screening by ensuring that the different reviewers cannot access each other's work.

In order to use this interface, you should first set up each reviewer's coding assignments in the Collaborate tab. This is described under **Allocating references for coding**.

To enter the 'Coding only' interface you must click on the 'Coding only' button when selecting your review.

The coding only option is available just after the login screen as well as in the **My info** tab.

The coding only interface has 2 main areas. The **Documents** tab is on the left as always. On the right side is the **My info** tab where the reviewers coding allocations and available reviews are listed.

When you enter the 'Coding only' interface the system will automatically load the list of 'Remaining' items from your first coding allocation.

My Info

Coding Only mode:

Your account expires on 16/03/2013.
Current (shared) review expires on 04/06/2013.

New review

My work allocations:

Codes to apply:	Group of studies	Allocated	Started	Remaining
Screening on Title and Ab	Group 3 T&A	44	0	44
Screening on Title and Ab	Group 1 T&A	131	131	0
Screening on Title and Ab	Group 2 T&A	131	131	0
Screening on Full Report	Group 1 Full report	53	53	0
Demo keywording tool	Group 1 Keywording	10	10	0
Demo data extraction too	Group 1	4	4	0

To begin coding click on **Go** for the first item and you will be taken to the **Document details** window.

The document details window will look the same except some of the functionality has been removed. The codeset properties icon has been removed so the reviewer cannot edit the codeset.

In the **Coding record** tab the coder will only be able to examine their own coding. The **Run comparison** and the **Live comparison** options have been removed. This means that the coder cannot see other reviewers work allowing true double blind coding.

The ability to upload full text documents has been removed as well although if a document has already been uploaded it will be available to the coder to access.

A review administrator can also restrict a reviewer to the 'Coding only' role through the 'EPPI-Reviewer 4 account and review manager'.   When a reviewer is the 'Coding only' role they will not have the option to load the review using the normal interface.

Grouping items

Quite often you may wish to create groups of studies or references based on how the items are coded. This is done using code sets.

For example, if you wanted to group all the references that were coded in a particular manner you would first run a search, based on a particular code, to identify the items (see **Searching**).

A code can now be assigned to the search results. Select the search result so the checkbox is ticked. Now right click a code in the Codes tab over on the right to display the menu. You will see an option labelled 'Assign items in selected searches to this code'. Click on this option and the selected code will be assigned to all of the items in the search.

You may wish to create a code set labelled Groups. In this code set you can set up a number of child codes, each one corresponding to a group.

This group of coded items can now be recalled at any time in the future.

Analysis of your data

As you code your studies you are building up a database of information about those studies. The analysis functions in EPPI-Reviewer enable you to analyse and synthesise the data you have entered. These features include:

- searching the data
- generating many different types of reports
- performing meta-analysis on the data

Searching

The data entered into EPPI-Reviewer are held in a powerful SQL database. This enables quick, sophisticated and sensitive searches to be performed.

To access the search functions click on the **Search** tab in the Home panel.
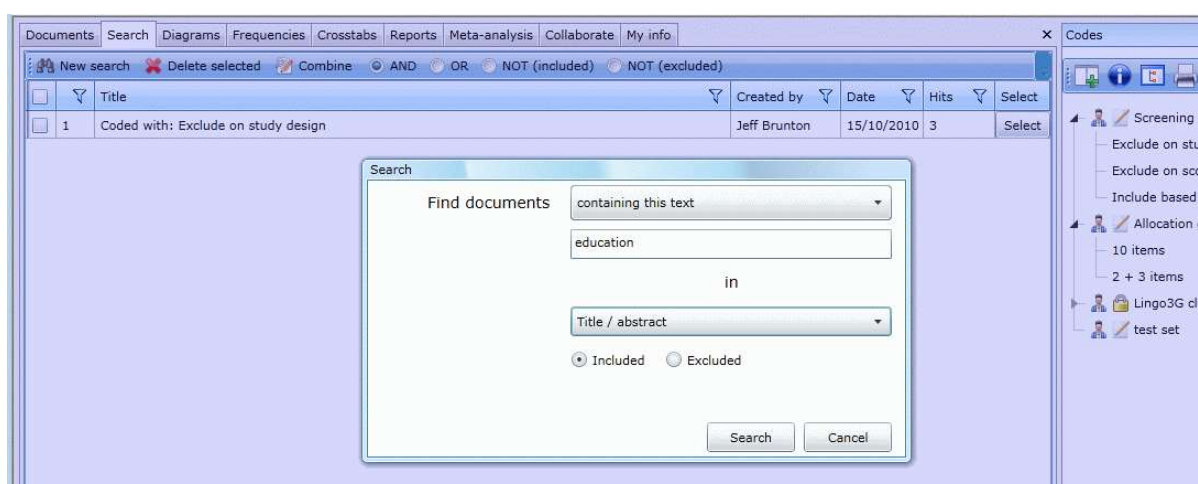
Each search is stored as a row in the in the search table. To combine searches, select the searches in the search table, select a Boolean operator and click on **Combine selected**. The new search will appear in the table. Click on the **Select** button in the appropriate row to list the results in the Documents tab.

All searches can be restricted to either Included documents or Excluded documents.

To carry out a search click on the **New search** button on the top of the screen. This will open the search window. From the this window searches are constructed.

	The **Search for documents i**con on the Documents tab will also give you access to the search functions.

Code set searching
From the top dropdown menu select either 'that have at least code from this set' or 'that don't have any codes from this set'. From the second dropdown menu pick the code set. Decide whether you are looking for excluded and included documents and then click Search.

 The search results will place the search results in the search table.

Code searching
From the top dropdown menu select either 'with this code' or 'without this code'. From the second dropdown menu pick the code. You can expand the code set to find the code to search on. Decide whether you are looking for excluded and included documents and then click Search.

The search results will place the search results in the search table.

Freetext searching
Every piece of free-text information entered is indexed and available for searching. Free-text searches include:

- searching for phrases
- Boolean searching for words in the same record
- wildcard searching (for example, "behavio*" will locate both English and American spellings of the word
- proximity searching
- inflectional searching (for example, entering the term "run" will also search for "running" and "ran")

The free text search can be applied to the Title/Abstract, additional text entered by the reviewer, the text of the uploaded documents (pdfs, word docs, etc.), Authors, document IDs and publication year.
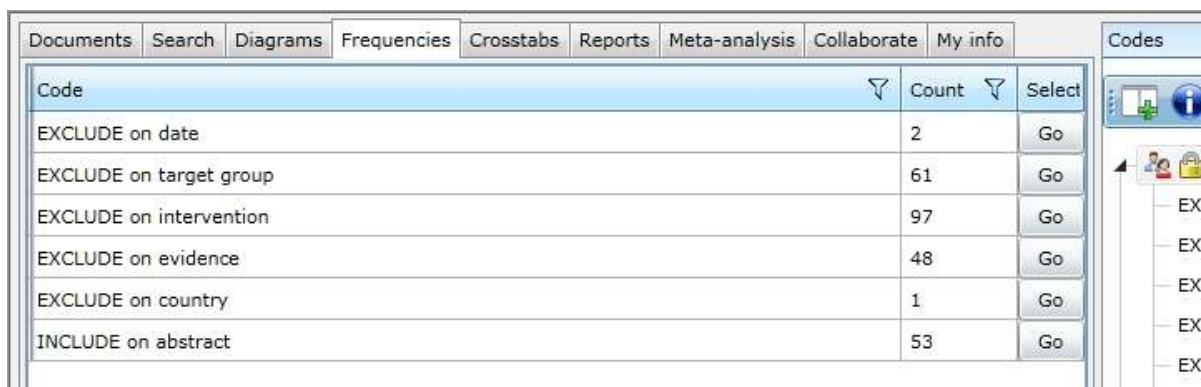
To search on free text information select 'containing this text' from the first drop down menu. Enter the text to be searched on in the box below. In the second dropdown menu select what to search. This could be Title/Abstract, Additional text (what you have entered) or Uploaded documents (any pdfs, etc. that you have uploaded), authors and document IDs. Now click on **Search** and the results will be displayed in the search table.

Frequency reports
Frequency reports allow a reviewer to gain an overview of the answers given to a particular question. It presents all possible answers together with the number of studies which were categorised with that answer and displays them in a table.

To run a frequency report, select the Frequencies tab in the Home panel. Highlight the code to be used in the Codes tab of the Toolbox panel. The frequency report will be generated based on the child nodes of the selected code.

Click on the **Get frequencies** button at the bottom of the Frequencies tab. The results will be displayed in a table where each row is a code. The frequencies of each code are contained in the Count column. Click on the **Go** button for a particular row and you are taken to the Documents tab where the selected items are displayed.

Code	Count	Select
EXCLUDE on date	2	Go
EXCLUDE on target group	61	Go
EXCLUDE on intervention	97	Go
EXCLUDE on evidence	48	Go
EXCLUDE on country	1	Go
INCLUDE on abstract	53	Go

You can limit the Frequency report to specific documents by selecting a code from the codes tab and clicking on **Set** for filter (optional).

You can also generate a frequency report for a codeset by right clicking on the codeset and selecting **Display included item frequencies (children)**. This operation will run a frequency report on the selected codeset and place the results in the Frequency tab.
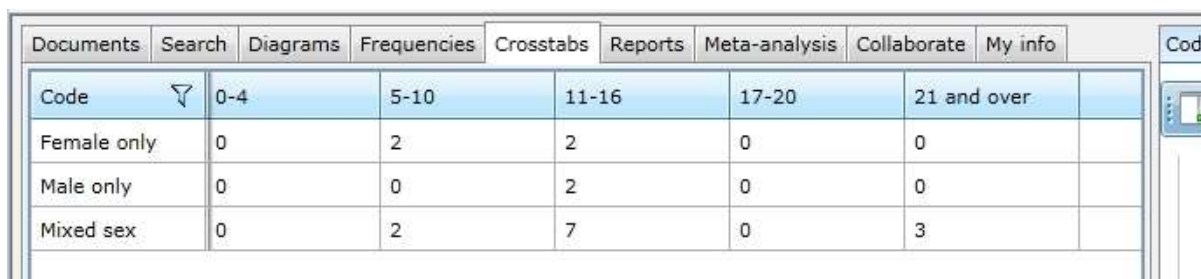
The results of the frequency report can be exported to a number of different formats including Word and Excel.

Crosstab reports

Using the crosstab report, it is possible to cross-tabulate the answers of one question against another into a matrix to find the relationship between certain answers. This function is useful when comparing things such as types of interventions against results.

To run a crosstabs report, select the Crosstabs tab from the Home panel. You should also select the Codes tab from the Toolbox panel. Now select a question from a code set. Set this as the X axis of the Cross tabs by clicking on **Set** for the X-axis in the Crosstabs tab. Select a second question and make that the Y-axis by clicking on **Set** for the Y-axis.

Now click on **Get crosstabs** to display the results. The matrix is displayed with the answers for one question in rows and the answers for the other question in columns. Clicking on the intersection point for two answers will list the documents that have been coded with both answers.

Code	0-4	5-10	11-16	17-20	21 and over
Female only	0	2	2	0	0
Male only	0	0	2	0	0
Mixed sex	0	2	7	0	3

You can limit the crosstab report to specific documents by selecting a code from the codes tab and clicking on **Set** for filter (optional).

The results of the Crosstab report can be exported to a number of different formats including Word and Excel.

Coding reports

Coding reports are a way of displaying all of the coding for an item across the different codesets. To access the coding reports functions click on the Get coding reports(s) for the selected item(s) icon.

	The **Search for documents i**con on the Documents tab will also give you access to the search functions.
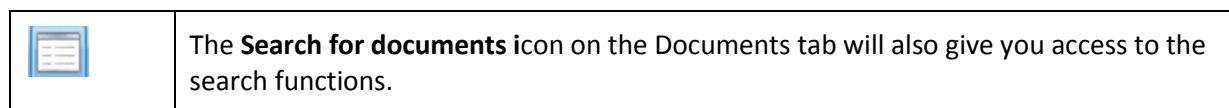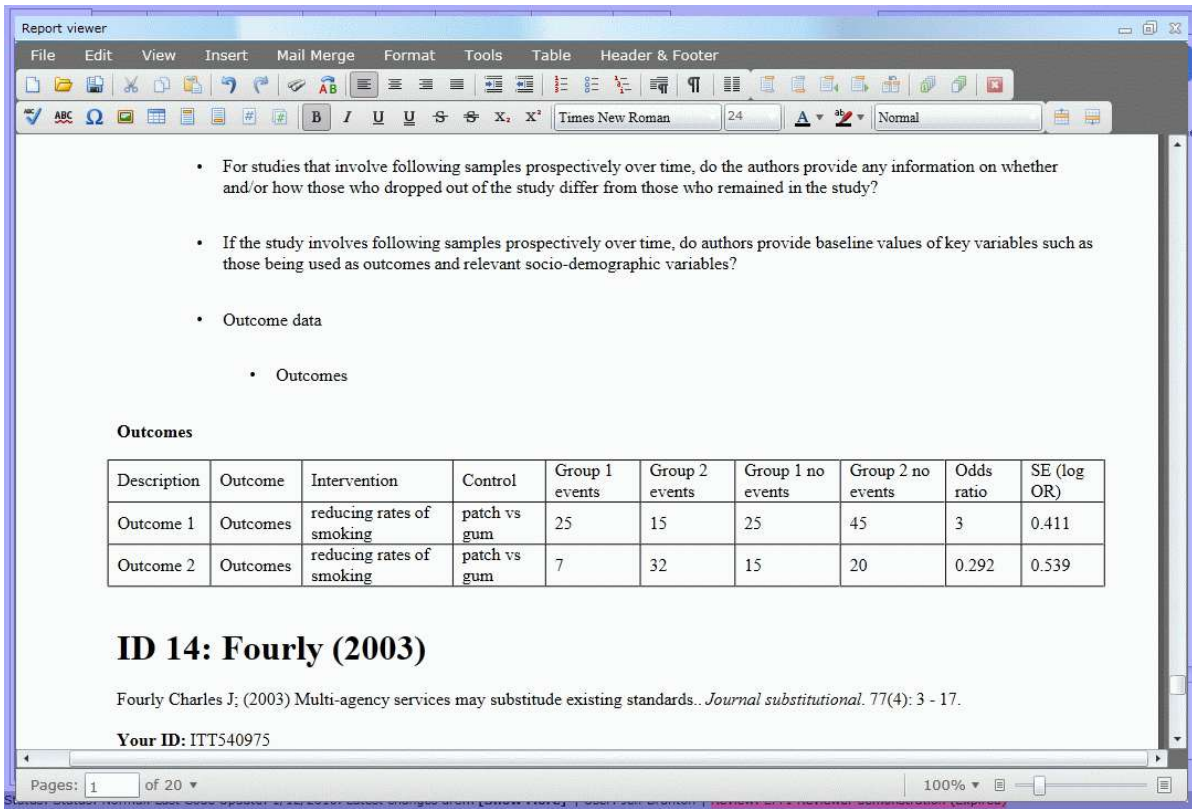
First select the item or items you wish to have in the report from the documents tab. Then click on the icon to access the Item coding reports window.
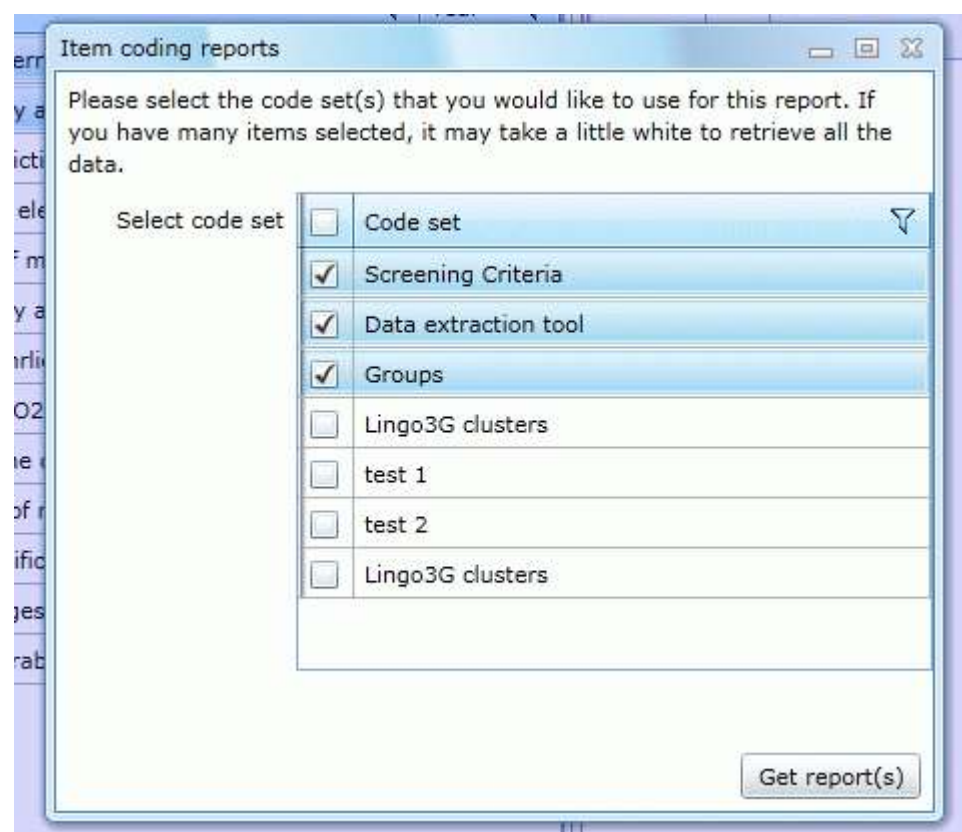
Select the codesets to include in the report and then click on **Get report(s)**.

This will produce a report that will display the citation, it's abstract and all of the coding that was carried out using the selected codesets. If no coding was carried out, only the citation and abstract will be displayed.

Configurable Reports

The report functions will allow the user to display their coding in many different formats. The user can select the codes or codesets to build the report and then select the documents to include in the report.

To create a report go to the Reports tab of the Home panel. Enter a name in the 'Report title' box and click on the **Save** button. This title can be edited at any time.

A report consists of one or more columns that contain the codes that make up the report. To add a new column to your report click on the **Add new column** button and the new column will be displayed on the screen.
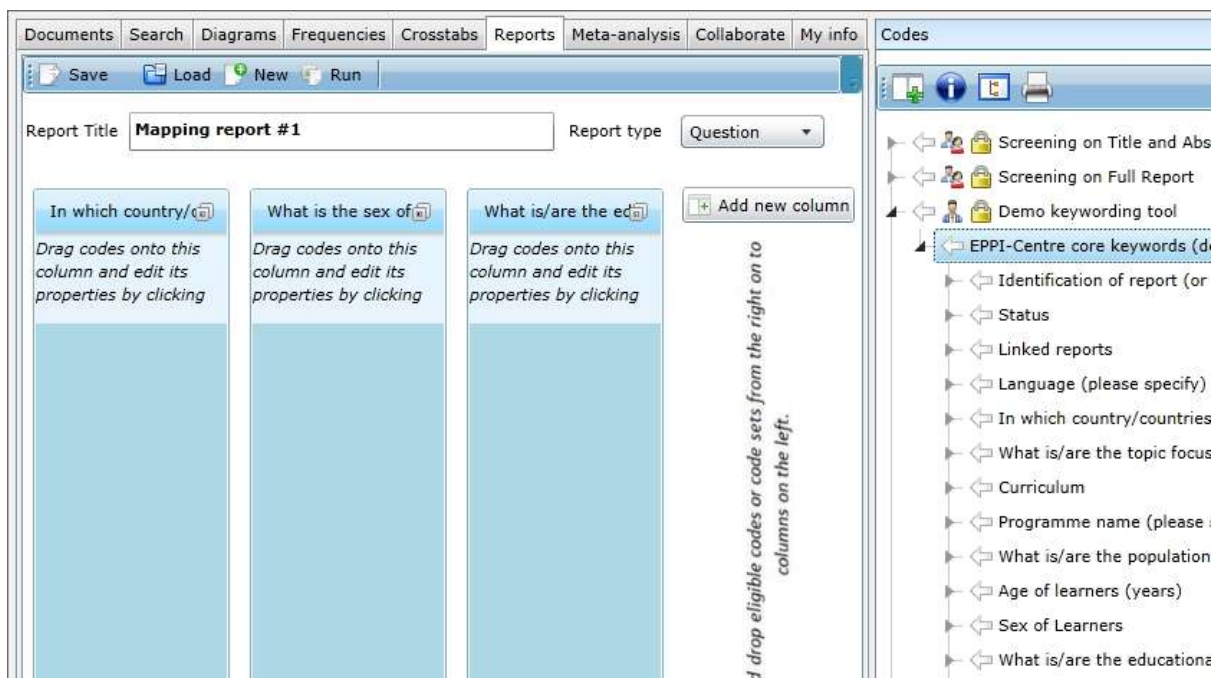
You can now drag the codes or codesets from the Code tab on the right side of the screen over to column. The codes or codesets that can be dragged will have an arrow next to them. Depending on the type of report the user can choose as many codes as they wish to put in a column. The user can add as many columns as they wish to a report.
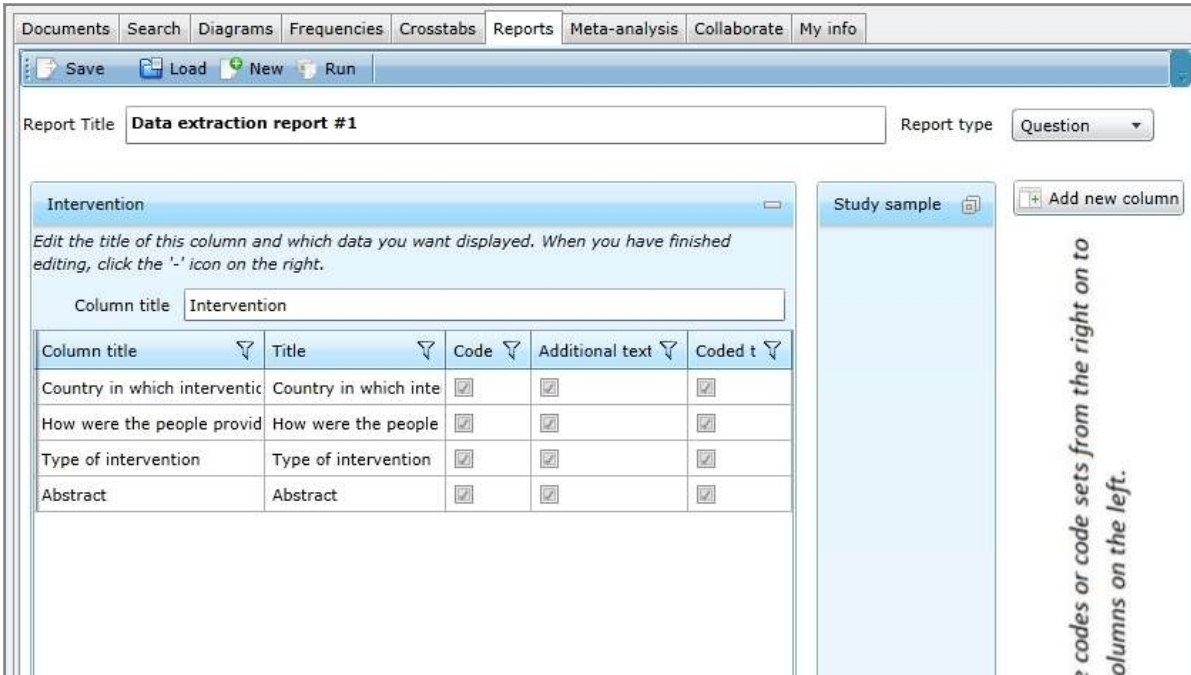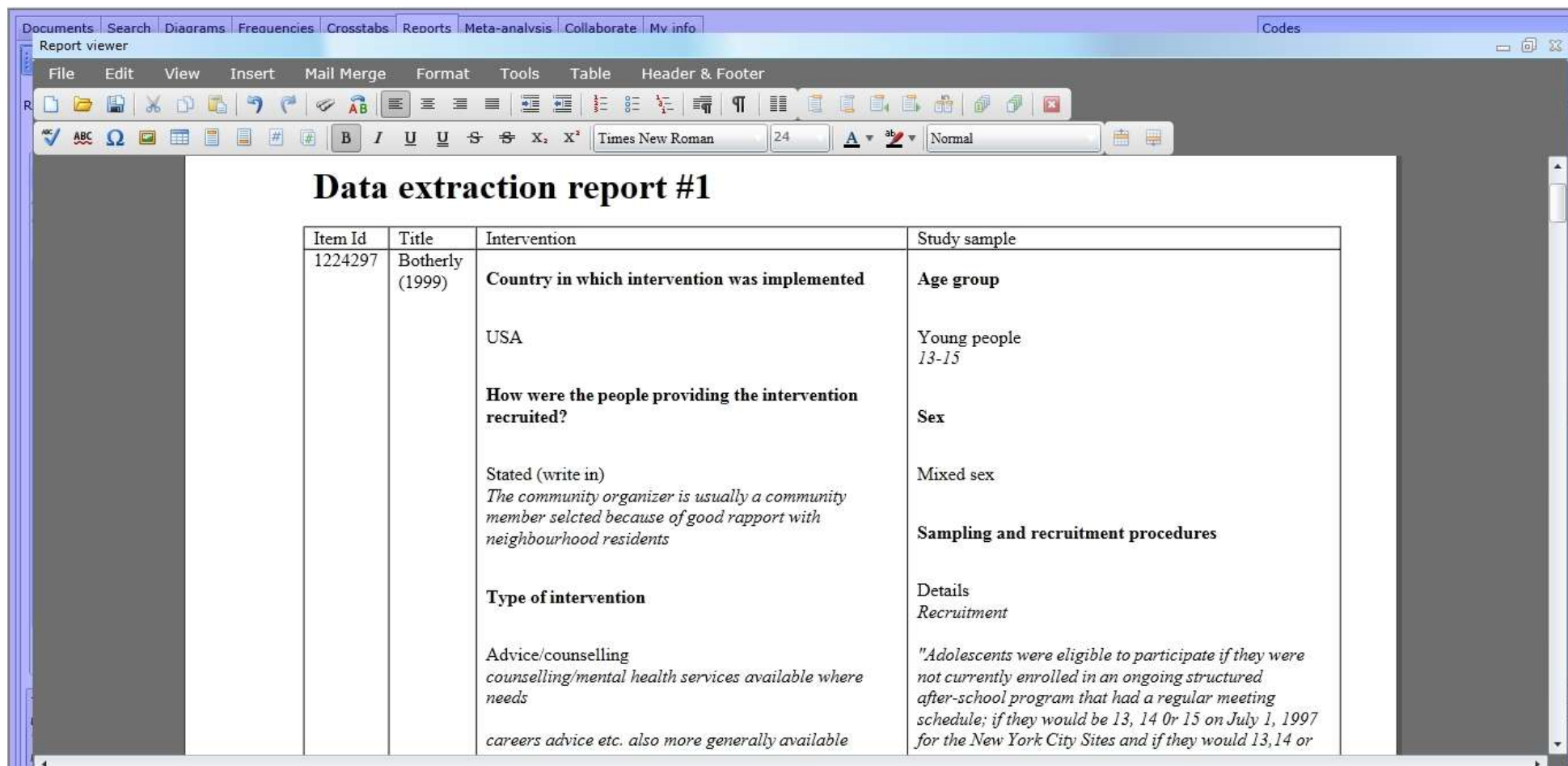
There are two types of report. 'Question' reports summarise all the answers or codes directly below a specified code or code set. These reports can also have multiple codes per column. 'Answer' reports contain one answer (code) per column. 'Answer' reports can also contain information about outcomes. Where this is selected, they default to a format that is suitable for use in other statistical software and do not display additional text.

You can change your report between 'Question' and 'Answer' using the drop down menu.
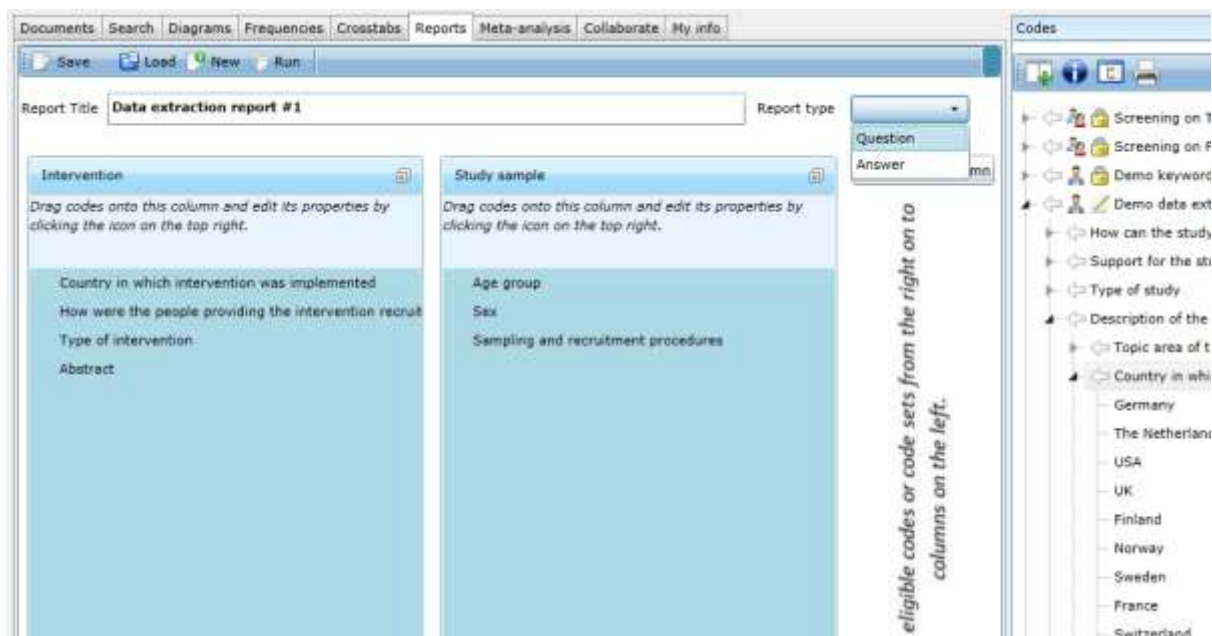
To edit a column's properties click on the Minimize button at the top right hand corner of the column. The column properties will displayed where the user can edit the Column title and choose what to display in the report. By

default the code selected, any additional text added by the user and any text coded in uploaded documents, such as pdfs, will be displayed in the report. This can be seen by the checked boxes.

Be sure to save your report when you have finished putting it together.

Once a report is saved it can be retrieved by clicking on the **Load** button next to the **Save** button at the top of the Reports tab.

To run a report first select the documents that will be included in the report. This could be documents grouped with a particular code or individually selected items. The documents to include should be selected in the Documents tab of the Home panel.

Once the documents are selected click on the **Run reports** icon in the Documents panel.

The **Run reports** icon can be found at the top of the Documents tab of the Home panel.

You can also click on the **Run** button at the top of the Reports tab.

Clicking on the Run reports icon opens up the Reports dialog box.

Select the saved report from the **Report** dropdown menu. If you have not already picked the items to include in your report you can select them based on previous coding by selecting **Items with this coding** in the **Items to include** dropdown menu. You can also decide the order the items in the report should appear from the **Order by** dropdown menu.

The Display option allows you to select fields from the citation to be displayed in the report.

Other options include whether to display the report in a horizontal or vertical alignment.
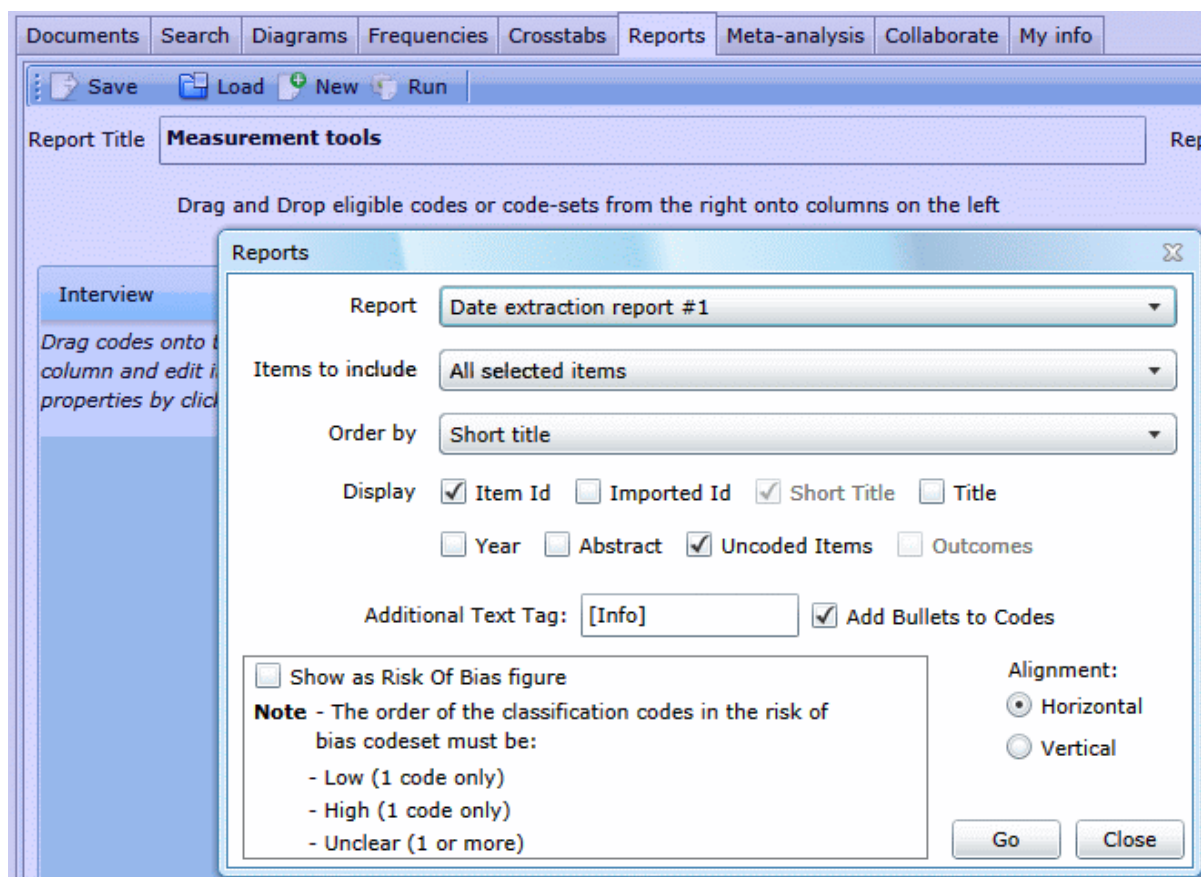
You can also specify a tag to place in front of the Info text and whether place bullets in front of the selected codes. Bullets are useful when the user may have selected multiple responses for a particular question.

The **Show as Risk of Bias figure** option is described below.

Once your options are selected click on the command button labelled **Go**. The report is then generated and displayed in the Report viewer window. From this window can user can edit, save or print the report.

Creating a Risk of Bias report

You can generate Risk of Bias diagrams using the configurable report function. A Risk of Bias diagram can be used to summarise reviewer judgements about the reliability of the studies in a review.

To generate these diagrams you must first create a risk of bias coding tool. This could be a separate codeset in your review or it could be part of an existing codeset. You are free to construct the tool however you wish to examine any concepts of the studies that may be subject to bias. The only restriction is that the ratings of risk must be in a particular order.

The order must be:

1. Low Risk

2. High Risk
3. Unclear

The names or wording that you give to the ratings is not important. You can word the ratings however you wish as long as the order is the same.

An example is shown of how the Cochrane Collaboration's risk of bias tool could be set up in EPPI-Reviewer.
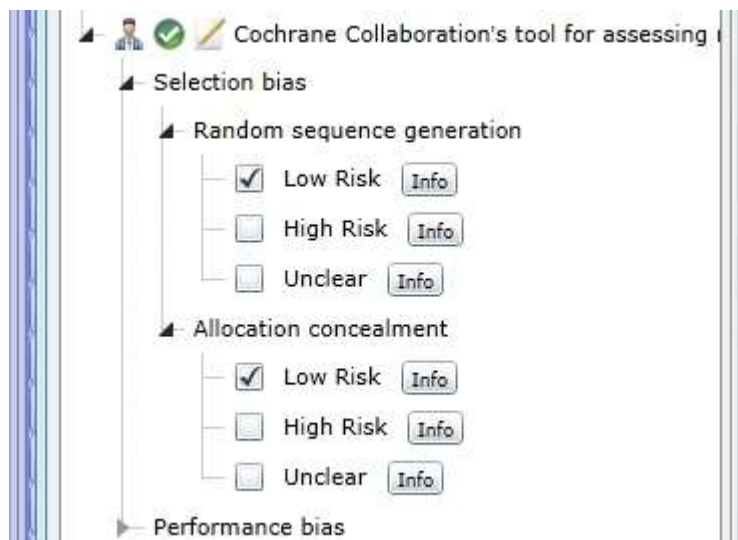
This particular tool is available to copy into your review using the **Codeset copy** utility that you can find under **Utilities** in the **EPPI-Reviewer 4 account and review manager**. You can find the **Account manager** on the **EPPI-Reviewer 4 gateway** (http://eppi.ioe.ac.uk/cms/er4).

Once you have created your coding tool and coded your studies you can create the risk of bias diagram in the Reports tab.
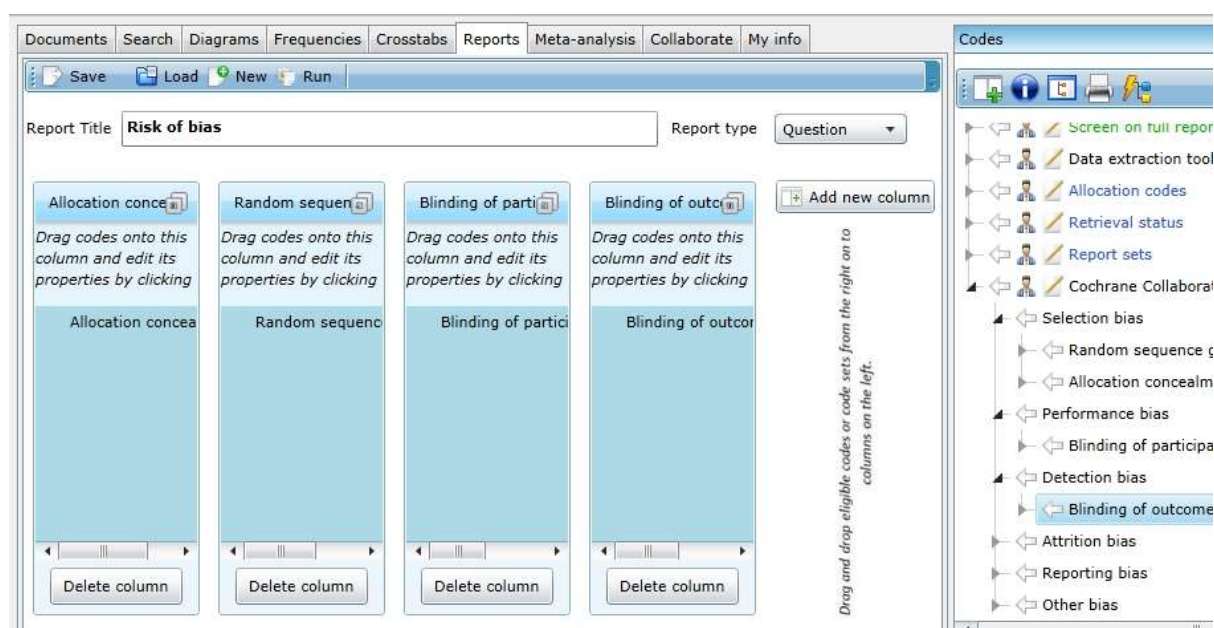
The report should be a **Question** report. You should start by creating a new column for each question that you wish to display and then drag in the appropriate question into each column from your coding tool. For the report to appear as you expect you will want to only have one question in each column.

Be sure to **Save** your report once you finished putting it together.

Once the report is set up you should click **Run**. This will bring up the **Reports** window.

From this window you should select the report name and the items to include in the report. You should also check the **Show as Risk of Bias figure** checkbox. Once you have done this click **Go**.

Two diagrams will be generated and displayed in the **Report viewer** window.

Report viewer

100%

Risk of bias

Item ID	Short Title	Random sequence generation	Allocation concealment	Blinding of participants and personnel*	Blinding of outcome assessment*
11960171	Answer (2001)	+	+	+	?
11960172	Botherly (2001)	+	+	-	-
11960173	Cautious (1998)	+	-	-	-
11960174	Evenly (2006)	?	-	-	+
11960175	Falter (2001)	+	+	+	+
11960176	Fitfull (1999)	-	?	?	+
11960177	Fortunate (2002)	-	-	+	?
11960178	Fourly (2003)	-	-	-	+

The first diagram will display each study in its own row and the rating that you have given it for each question. The low risk ratings are shown as green with a plus sign, the high risk ratings are red with a minus sign and the unclear items are displayed in yellow with a questions mark.

Random sequence generation	50%	12%	38%
Allocation concealment	38%	12%	50%
Blinding of participants and personnel*	38%	12%	50%
Blinding of outcome assessment*	50%	25%	25%

Low risk of bias: Unclear risk of bias: High risk of bias:
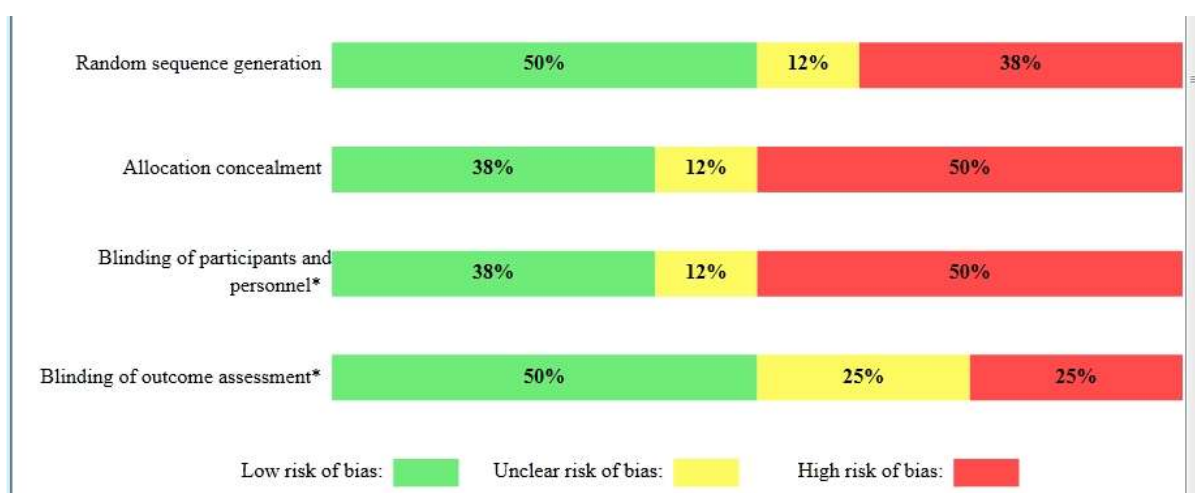
The second diagram will display the percentage of items that were assigned a particular rating with respect to each question. The colour coding is as before (green : low, red : high, yellow : unclear) but with the percentage written in the bar.

As with all other reports that are displayed in the Report viewer you can save it as a Word document, or an html file or a text file. If you wish to have it in Excel you just need to save it as an html file and then open that file in Excel.

Creating a report that best displays your data

The report function offers the user many options on how to best present their data. How to set up your report can depend on how you have set up your coding tool.

If your coding tool has many levels you will need to drag the lower levels to the columns as report function will only examine one level of hierarchy at a time. You can place the lower levels in the same column or different columns depending on what you prefer. For example, if you were creating a multiple report and your coding tool looks like this (see below), the root level would be 'Small Animals'. To be sure you had all responses in your report, including the levels below the root level, you should drag in 'Small Animals' and the levels below them such as 'Infection' so you would get the codes below that level. This will ensure that all of the possible responses will be accessible to the report.
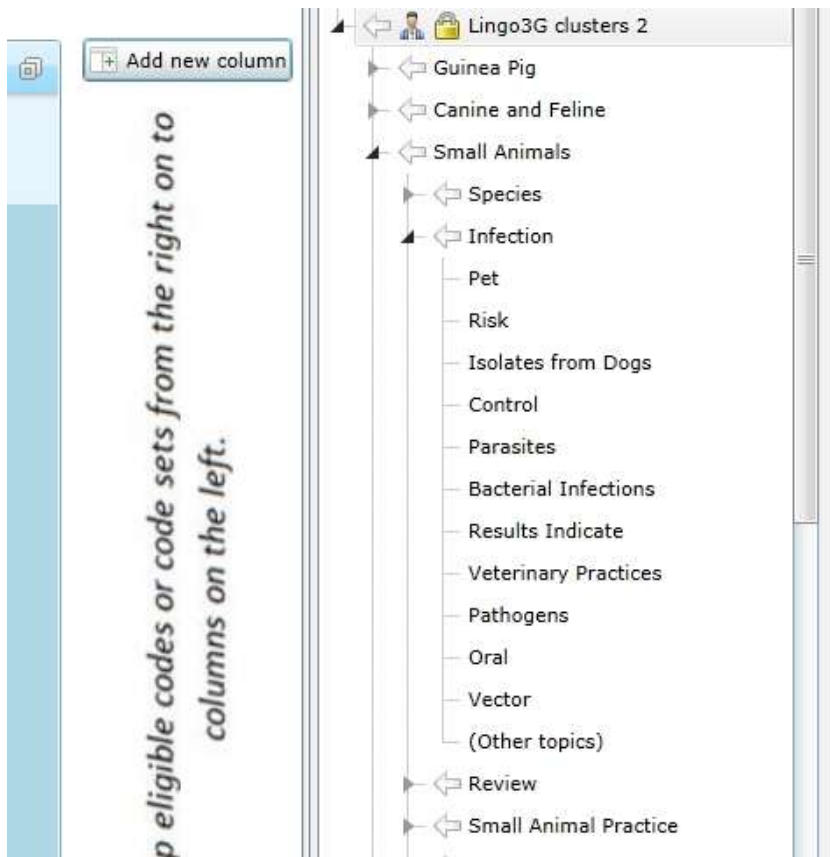
These are a few examples of reports for different scenarios.

1. Show the responses to a number of questions In the same column

This is how it looks when setting it up.

This is how it looks when presented.

This can be set up with multiple columns so you can group related questions in each column.

2. Have a question in each column

This is how it looks when setting it up.

This is how it looks when presented.

3. Show the responses to a question but have each answer in it's own column

This is how it looks when setting it up.

This is how it looks when presented.

4.   Show the outcomes entered for the studies
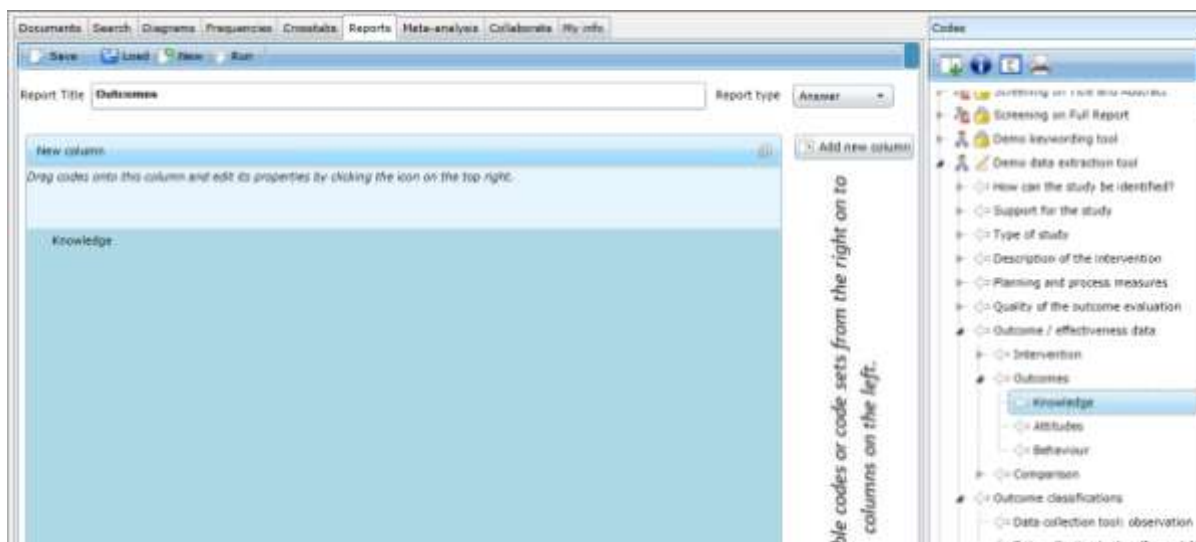
This is how it looks when setting it up.

Be sure you have checked **Outcomes** when running the report.

This is how it looks when presented.

The column widths will need adjusting depending on the content.

Meta-analysis

A statistical meta-analysis allows the user to combine the numerical results of primary research studies that are addressing similar research questions.

EPPI-Reviewer contains a suite of functions to support statistical meta-analysis, supporting this process from the extraction of data from primary studies to the production of forest plots and sub-group analyses.

There are three stages involved in conducting meta-analysis on EPPI-Reviewer:

1. Setting up your coding tool
2. Entering outcome data
3. Getting your results

```
        ┌─────────────────┐
        │  Set up coding  │
        │      tool       │
        └─────────────────┘
                 │
                 ▼
        ┌─────────────────┐
        │  Enter outcome  │
        │      data       │
        └─────────────────┘
           ↙           ↘
┌─────────────────┐  ┌─────────────────┐
│ Get results: run │  │  Get results:   │
│  meta-analyses   │  │   export data   │
└─────────────────┘  └─────────────────┘
```
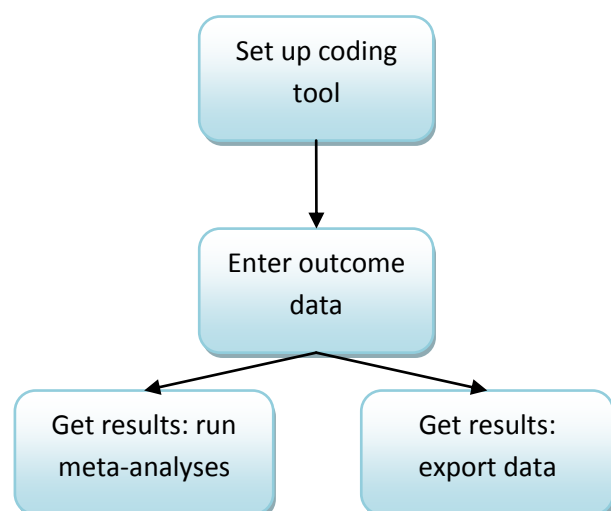
Results are available in two forms: either through the built-in statistical functions within ER4, or though exporting your data for use in other statistical packages (such as stata, SPSS or excel).

Please note: The newest meta-analysis functions in ER4 allow for complex meta-analysis analysis to be undertaken and the new capabilities mirror most of those found in other software packages. Specifically, the new functions are based on the 'metafor' package in R. In their reporting, users of these functions should cite: Wolfgang Viechtbauer (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software*, 36(3), 1-48

Users of these functions should familiarise themselves with these techniques and the underlying assumptions before undertaking meta-analyses – many of these are discussed in the EPPI-Centre Introductory text on systematic reviews (which also contains suggestions for sources for more indepth reading): Gough, D., Oliver, S., & Thomas, J. (Eds.). (2012). *An introduction to systematic reviews*. Sage.

The example that follows assumes that you are doing a 'standard' meta-analysis, which is looking at the effectiveness of a given intervention using controlled trials. However, the functions work equally well for other types of analysis, including the synthesis of correlation coefficients.

Special mention should be made to two chapters which have informed the development of these functions: Borenstein M, Hedges LV, Higgins JPT, Rothstein HR (2009) Subgroup analyses. In: Introduction to Meta-Analysis. : John Wiley & Sons, Ltd, pages 59-86; and Deeks JJ, Douglas AG, Bradburn MJ (2001) Statistical methods for examining heterogeneity and combining results from several studies in meta-analysis. In: Egger M, Davey Smith G; Altman DG Systematic Reviews in Health Care: Meta-analysis in Context. London: BMJ Publishing Group.

Setting up a meta-analysis in EPPI-Reviewer

Planning

You should begin to plan your meta-analysis at the beginning of your data extraction, so that you classify your studies in the way that you want to be able to use them in the meta-analysis. There are three types of codes to consider creating in your code set:

- Study codes;
- Intervention / Outcome / Comparison codes; and
- Outcome classification codes

Stage 1: Setting up the coding tool

Setting up coding tools, as described under **Setting up the coding tool** earlier in the manual, is a matter of creating a code set and then right-clicking its nodes to create the structure of your choice. The same tool is used for meta-analysis, but the types of codes involved are slightly different.

Usually, when you are setting up codes for data extraction, you use the top two options in the dropdown list depending whether you want a code to be selectable (i.e. appear with a checkbox next to it) or not. Codes for outcomes are set up in the same way, though additional options are available: outcome, intervention, comparison, and 'outcome classification code'.

It is not necessary to use intervention, comparison or classification codes, though you do need to set up at least one outcome code for the 'outcomes' button to appear on the coding screen.
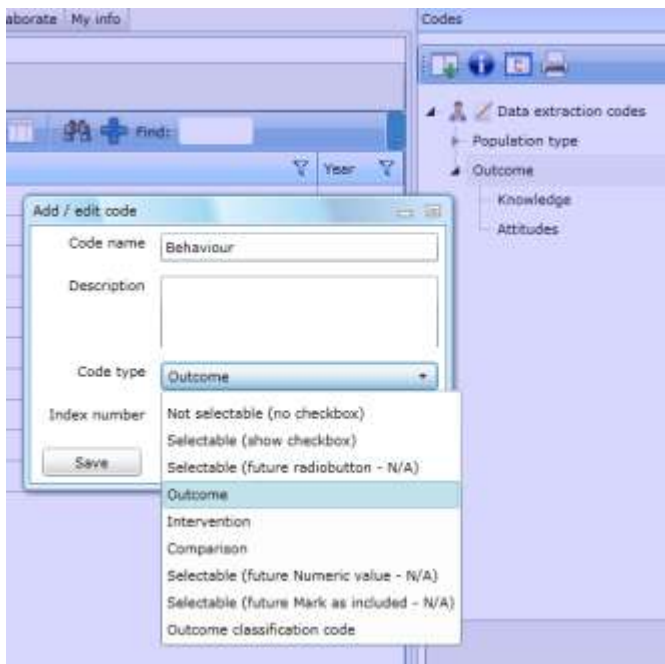
Outcome, intervention and comparison codes

Codes which allow you to classify the outcome, intervention and comparison are each individually selectable. While you may need to compile a list of, for example, all the outcomes a study evaluates (and so select from a list when doing a data extraction of a study), you also need to be able to distinguish which outcome from the list each outcome refers to. The same principle applies to interventions and comparisons. If you specify that a given code is

one of these types, it is still selectable in the standard coding screen, but it also then appears in the screen where statistical outcome data are entered, and in the meta-analysis screens.

Outcome classification codes

As well as being able to specify the set categories of outcome, intervention and comparison, it is also possible to set up as many additional categorisations are needed. These are useful in situations in which you have multiple outcomes with the same outcome, intervention and comparison definitions. An example of their use might be sub-group analyses in which results are presented separately for males and females, or to be able to distinguish different types of measurement tool for assessing the same outcome. Outcome classification codes appear as a list of selectable checkboxes on the right hand side of the screen where statistical data are entered.

Once you have set up at least one code as an outcome, the 'outcomes' button will appear on the coding screen

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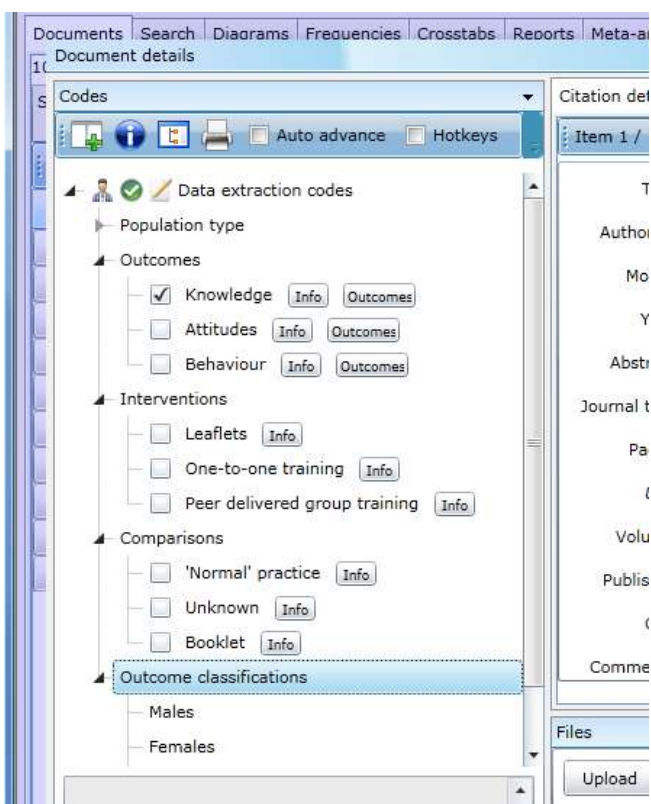
Summary of EPPI-Reviewer code types

Study codes

These are normal 'answer' codes in a code set. They describe a given study characteristic, for example, an aspect of the population, or particular intervention component. These characteristics are constant for all outcomes – they only vary across studies, not across outcomes in the same study. The ways of creating these codes are documented above.

Intervention / Outcome / Comparison codes

These are specific categories which are useful for classifying outcome characteristics. Importantly, they can differ *between outcomes in the same study*, so are applied to individual outcomes, rather than whole studies. These are special code types that are selected when you create a new code.

Outcome classification codes

Like intervention / outcome / comparison codes, outcome classification codes are codes which apply to individual outcomes, rather than the whole study. For example, you might want to have classification codes which allow you to identify the follow-up period for intervention measurement, as you might have several of these per study. Classifying study outcomes in this way allows you to quickly to identify specific sub-sets for meta-analysis.

Stage 2: Entering outcome data

Once you have specified at least one code as being an 'outcome' (in order for the outcome button to appear in your coding screen), you are able to enter outcomes. Outcomes are associated with a given code set, so you will need to have at selected at least one code for the coding record to be created. Clicking the 'outcomes' button presents you with a small box containing a list of the outcomes already entered (in your current coding record) against the study record you are working with.
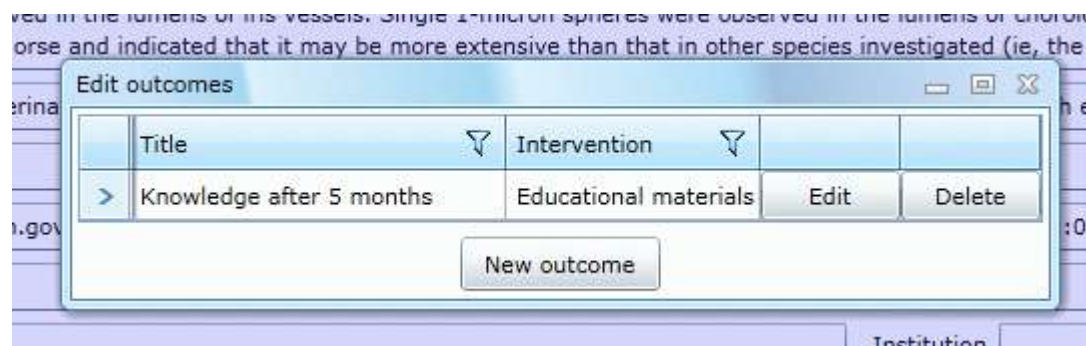
You can edit existing outcomes, enter new ones and delete redundant outcomes from this screen. Clicking 'new outcome' will cause the outcome editing screen to appear
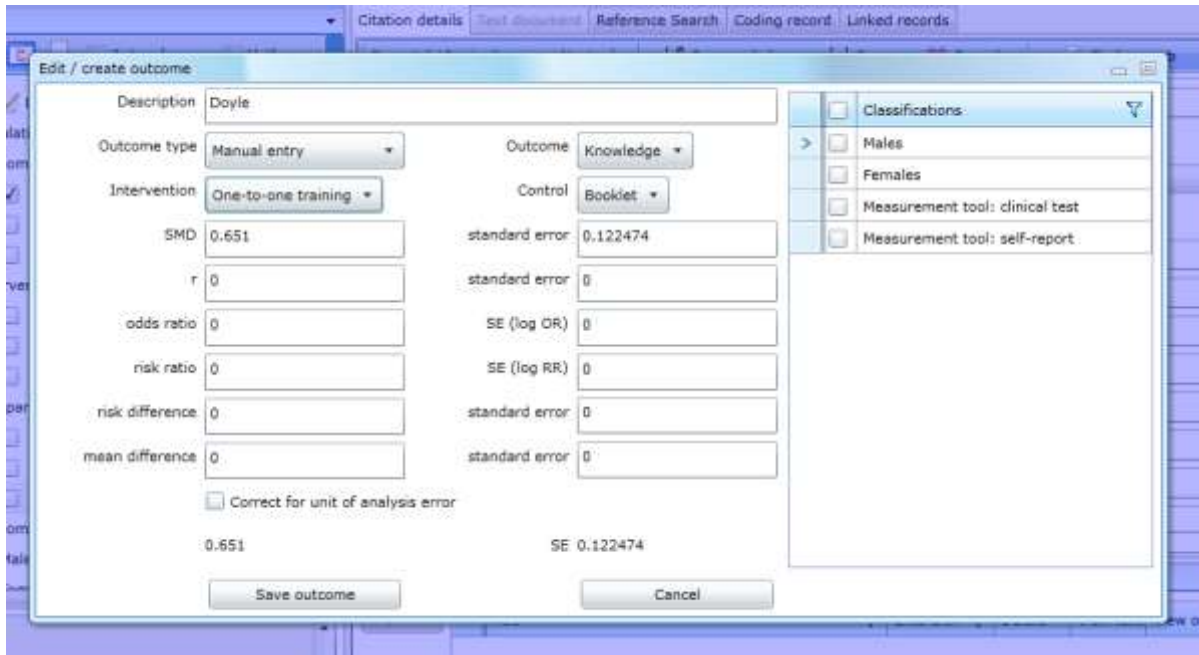
This figure shows an outcome being entered manually. The codes set up previously all appear in the appropriate places on this screen: outcomes, interventions and comparisons are available to select on the left hand side, and classification codes appear as a list on the right.

As well as classifying outcomes, of course, this screen enables you to enter numeric data. There are currently eight types of outcome available. If you require other types please contact us and we will see if they can be added to the program.
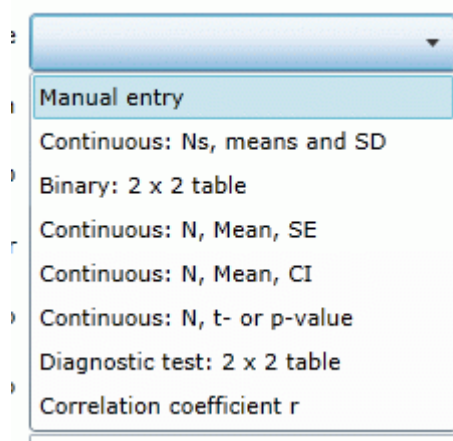
You should name the outcome, enter your outcome data based on the outcome type selected and then click **Save outcome**. Once you have outcomes entered, you can view them from the 'coding record' tab by clicking view.
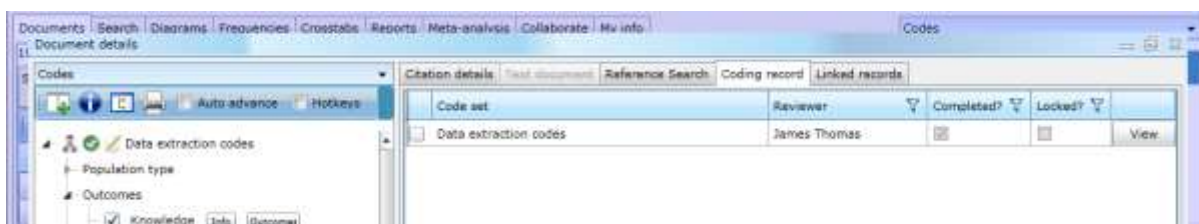
Your outcomes will then appear in a table as shown below (image is for demonstration purposes only).

The saved outcomes are available for running meta-analysis once the coding for that item is marked as completed.

Stage 3: Setting up your data and choosing studies for inclusion

There are two ways of using the data entered as outcomes in ER4: running meta-analyses with the ER4 program itself, and exporting the data for use in another software application.

Running meta-analyses in EPPI-Reviewer

Once outcomes have been entered, they can be selected for inclusion in individual meta-analyses on the 'Meta-analysis' tab. Any existing meta-analyses will be listed.

Existing users will see options for editing/running meta-analysis (using a new set of commands added in in September 2015), or will be able to run commands using the 'old' method. When the same specifications are entered, both methods should give the same results, although selecting the edit/run option will allow users greater flexibility and functionality over the analyses that are undertaken and the diagnostics and outputs that are produced.

Users setting up new meta-analysis will be guided through the full set of (new) options, which are discussed below.

To create a new meta-analysis click on the **New meta-analysis** button. This will open the Setup meta-analysis window.

The window gives a snapshot of the data to be synthesised as well as the possible commands and options available for the meta-analysis.

Setting up your meta-analysis

Once you have completed your data extraction, you are ready to create your meta-analysis. The 'meta-analysis' tab allows you to create and edit any number of meta-analyses. The **Setup meta-analysis** screen is the place to do this.

How to use the functionality available in the meta-analysis table

How the Intervention / Outcome / Comparison and Outcome Classification codes can be used

There are some special codes which can be used within the meta-analysis interface. If you set the code-type to be *outcome, intervention, comparison* or *'outcome classification code'*, these codes appear in the 'edit outcome' window.

Intervention, outcome and comparison codes appear as drop-down options in the 'edit outcomes' window

And 'outcome classification codes' appear as a list of check-boxes to categorise outcome characteristics

Outcome classification codes appear as individual columns too, with a '1' indicating the checkbox was ticked, and a '0' indicating that it wasn't.

The contents of the outcome, intervention and comparison dropdown boxes from step 2, now appear in columns in the 'edit meta-analysis' window

How you can use generic study-level codes to organise outcomes in your meta-analysis

2. You can select either an individual code, or a question – which will result in the values entered for that question being placed in the cells below

1. Any code or question from your data extraction / risk of bias assessment can be added as a column in the meta-analysis table. Just click 'add column'

3b. Here, we selected the question 'type of control group', so we have the answers selected for each study entered into the column. (Note how the 'inactive controls' which are identified in this column are reflected in the column on the left – with '1's)

3a. Here, the answer 'inactive control' has been selected. The outcomes from studies which have been coded with that code are given a '1'.

Stage 4 – specifying the data type

As with entering the numeric outcome data, the outcomes, interventions and comparisons are available in order to help you select which outcomes you want to include in each analysis. As well as specifying which outcomes should be included in the analysis, you also select the effect measure you want to use in the meta-analysis (odds ratio / mean difference, etc). Users can select which type of outcome to analyse through clicking on the drop down menu. In the example below the data contain both binary and continuous outcomes – only values for the selected outcome type will appear (others will be viewed as zero) and be selectable on the left hand side.

It is therefore not possible to combine different outcome types without first transforming the data (e.g. using Chinn's formula to convert odds ratios to d's and vice versa). *note in the next planned iteration there will be additional functionality to help users to undertake such transformations.

The full range of outcome types available are:

Stage 5 – specifying the model type

EPPI-Reviewer now supports a greater range of models including fixed effects meta-analysis as well as a range of different random effects models that employ different techniques to estimate the between study variance.

There are now five different options for meta-analysis in ER4

There are a range of sources that can provide support in guiding the selection of different meta-analysis model as well as aiding in the interpretation of their output. These include:

- Higgins, J. P. (Ed.). (2008). *Cochrane handbook for systematic reviews of interventions* (Vol. 5). Chichester, England: Wiley-Blackwell.
- Cooper, H., Hedges, L. V., & Valentine, J. C. (eds.) (2009) *The handbook of research synthesis and meta-analysis*. Russell Sage Foundation.
- Borenstein, M., Hedges, L. V., Higgins, J. P., & Rothstein, H. R. (2011). Introduction to Meta-analysis Wiley. com.
- Further information is also available within the metafor documentation https://cran.r-project.org/web/packages/metafor/metafor.pdf and may want to post queries or discuss issues on http://stats.stackexchange.com/

In brief, the five options entail the following assumptions around the data:

a. Fixed effects models make the assumption that within study variance may differ but that there is homogeneity in effect size across studies (note - this is often an unlikely assumption in practice and users should examine the heterogeneity statistics given in the outputs carefully; for fixed effect models only the Q value and the result of whether the heterogeneity is statistically significant are provided)

b. DerSimonian-Laird (DL) models are the most commonly used form of random effects model in the literature. Random effects (RE) models explicitly assume that there is heterogeneity in the true underlying effect under study, and the different types of model estimate the between study variance (tau squared (τ^2) in different ways with different assumptions. This is also used as an additional factor in weighting the studies. In the case of DL models, there is no specification as to the form of this variance.

c. In Maximum Likelihood (ML) estimation, assumptions are made around the distribution of the between study variance (normality) which are necessary to solve using the log likelihood function[1].

d. Restricted Maximum Likelihood (REML) estimation is similar to the ML above, but only part of the likelihood function that is fixed is maximised.

e. Empirical Bayes (EB) models are a reduced form of full Bayesian models that allow for flexibility in the estimation of the model parameters (which are derived from the data themselves as opposed to prior knowledge or subjective judgement). While they represent a reduced form of Bayesian models, they may be equally as computationally complex (and therefore less likely to converge; for more information and an overview of Empirical Bayes models and Bayesian meta analysis more generally see Sutton, A. J., & Abrams, K. R. (2001). Bayesian methods in meta-analysis and evidence synthesis. *Statistical Methods in Medical Research*, *10*(4), 277-303.).

Running a random effects model does require sufficient between study heterogeneity, and this is not always the case (where there is not sufficient between study heterogeneity the estimates will be identical to a fixed effects model). In a number of cases where there are a large amount of studies and significant between study heterogeneity, the simplest DL model will suffice; although ML and REML may be favoured and provide better estimates where there is a small number of studies. ML, REML and EB are more complex estimators. Overall, there is no definitive answer as to which model specification should be used when running a meta-analysis – this is mainly determined by the data that are entered into ER4 - and ER4 users should read up on the suggested references at the beginning of section 2 before proceeding (Borenstein et al 2011 provide a useful outline).

---

[1]

Stage 6 – specifying additional modifications, model output, and publication bias options

1. **Knapp-Hartung adjustment** – This option is available for RE models only and provides an alternative means of calculating the variances. There is not complete consensus in literature on whether the use of this adjustment improves estimates – there are many occasions when it appears advantageous although there are other instances where it appears to provide estimates that are too conservative. The choice of model selection (above) and the degree of heterogeneity also have implications as to whether selection of KH adjustment is appropriate. In STATA's meta-regression package, the adjustment is set to default, although in R (and hence ER4) users can select this option. ER4 users are advised to note/report whether adjustment is used in their analyses in reporting results. For more information on the relative merits and drawbacks of this adjustment please see: Röver, C., Knapp, G., & Friede, T. (2015). Modified Knapp-Hartung random-effects meta-analysis recommended for applications in rare diseases. arXiv preprint arXiv:1508.01227

2. **Significance level and decimal places** – The default for these is 95% with outputs showing estimates with up to four decimal points. Users may want to alter the significance level of tests from 95% infrequently, but may choose to alter decimal places more often to match journal/publishing requirements.

3. **Rank correlation test for funnel plot asymmetry** – This test carries out the rank correlation between standardized intervention effect and its standard error to assess the extent of publication bias. This tests the extent to which the association between the effect size of studies and their size is greater than might be expected by chance; significant tests indicate evidence of publication bias. The output produces an estimate of Kendall's tau (the correlation coefficient) and its p-value. The specific test used is that proposed by Begg and

Mazumdar (1994)[2]; Egger's test is an alternative (see 5). Although this test is based on the funnel plot, users will need to select this in the output [select 6 to produce funnel plots]. For further notes see http://www-users.york.ac.uk/~mb55/msc/systrev/week7/pub_text.pdf on publication bias.

4. **Trim and Fill -** Unlike the test proposed in 3 and 5, trim and fill is a means of estimating the impact of potential publication bias on the estimates through trimming extreme values and 'imputing' values for 'missing' studies. Trim and fill is essentially a means of identifying and correcting for asymmetry in funnel plots – it is based on the assumption that any asymmetry in the funnel plot is caused by publication bias and needs to be 'corrected' in this way. In some cases, this can be quite a strong assumption to make. Rothstein and colleagues have a whole book dedicated to publication bias which includes detailed description of the merits and drawbacks of this procedure[3]. Users implementing trim and fill will find that their model outputs now contain unadjusted estimates as well as trim and fill adjusted estimates (see example below)

> **Trim and fill**
>
> Estimated number of missing studies on the right side: 2 (SE = 2.3028)
>
> Random-Effects Model (k = 13; tau^2 estimator: DL)
>
> tau^2 (estimated amount of total heterogeneity): 1.5587 (SE = 1.5786)
>
> tau (square root of estimated tau^2 value):   1.2485
>
> I^2 (total heterogeneity / total variability):   99.33%
>
> H^2 (total variability / sampling variability): 149.34
>
> Test for Heterogeneity:
>
> Q(df = 12) = 1792.0287, p-val < .0001
>
> Model Results:
>
> estimate   se   zval   pval   ci.lb   ci.ub
>
> 0.6470   0.3552   1.8218   0.0685 -0.0491   1.3432   .

5. **Egger's test** for publication bias is based on the Galbraith plot (which is produced as standard in output) and is based on whether the intercept in a regression of x and x deviates significantly from zero. Where the intercept does deviate at a statistically significant level, this is taken as evidence of publication bias. The ER4 output produced gives the t-test statistic, standard error and a p-value.

6. **Show funnel plots** – Four funnel plots are produced when this one is selected; the most familiar is that plotting the Standard Error (SE) against the effect size.

7. **Show box plot and q-q charts** – These can be used to explore assumptions in the data and to assess the presence and influence of outliers in the data.

8. **Show credibility/prediction intervals** – This is appropriate for Random Effects (RE) models where the overall effect is the average of the true effects; in this case a prediction interval can help understand what might be the effect within an individual study through calculating alternative confidence intervals, which are displayed on the forest plot. (Note: future planned updates of ER4 will display the values of the interval on the forest plot)

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[2] Begg, C. B., & Mazumdar, M. (1994). Operating characteristics of a rank correlation test for publication bias. *Biometrics*, 1088-1101.

[3] Rothstein, H. R., Sutton, A. J., & Borenstein, M. (Eds.). (2006). *Publication bias in meta-analysis: Prevention, assessment and adjustments*. John Wiley & Sons.

Stage 7 – Choosing forest plot options

- ER4 users can choose from the following options in specifying forest plots

Forest plot options

x-axis title SMD

Summary estimate (title) fect size for HCV

☑ Add annotations

☑ Show weights along with annotations

☑ Show summary estimate (or fitted values for moderators)

Stage 8 – Interpreting and exporting output

When you click **Run meta-analysis** the results are displayed in the **Report viewer**. From this screen you have the option of editing and printing the results or saving them in a number of different formats. These include Word, text and html. If you save it as html you can open the file in excel thus saving your results as an excel file as well.

Stage 9 - Subgroup analysis

EPPI-Reviewer also supports limited subgroup analysis. You perform these by selecting two outcomes from your list and clicking 'sub-group analysis.

*Note – the functionality of subgroup analysis and moderator analysis in regression will be improved in future iterations of ER4. Currently all sub-group analysis takes place off the main meta-analysis screen. Currently, readers should familiarise themselves with how to add in study characteristics and select studies on the basis of these (see Stage 3)

	Meta-analysis		Effect measure		Outcome	Intervention		Comparison				
☐	All studies		Continuous: d (Hedge:						Edit	Delete	Run
☑	Group A		Continuous: d (Hedge:	Knowledge	Leaflets		'Normal' practice	Edit	Delete	Run
☑	Group B		Continuous: d (Hedge:	Knowledge	One-to-one training	'Normal' practice	Edit	Delete	Run

The studies from the two selected meta-analyses are then entered into a sub-group analysis. The variance in the random effects analysis is calculated individually for each sub-group, though the pooled effect size at the bottom of the plot assumes that there is no 'meaning' in the sub-groups and is therefore based on the variance across all the studies, as though they were not subdivided. The statistical test for difference is 'Method 1' from the chapter on Sub group analysis in Borenstein et al 2009 (for both fixed and random effects models). The calculation to establish the amount of 'heterogeneity explained' by the sub-group division is taken from the same chapter (page 179).
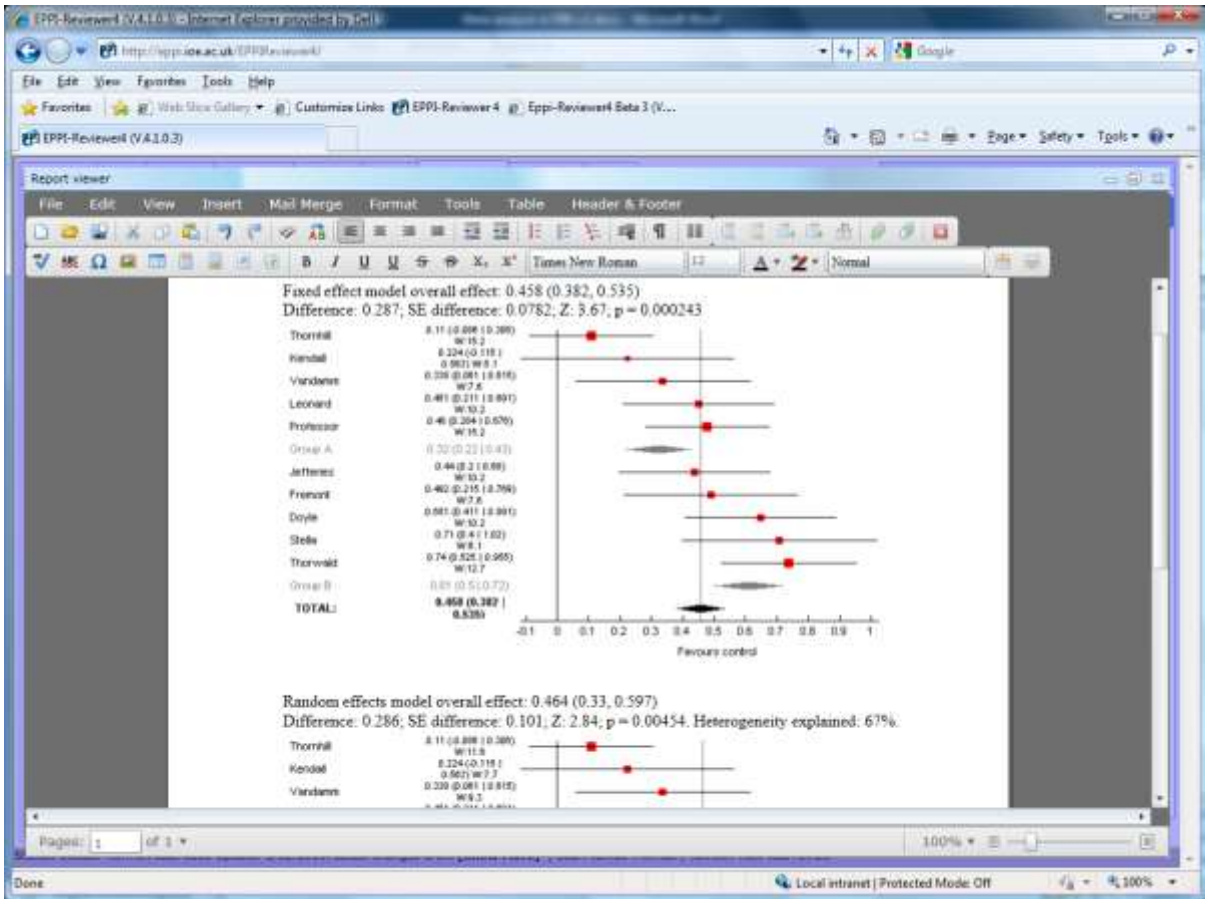
Exporting effect sizes in reports

The final function to be outlined here is exporting outcomes data in reports. Details on creating reports can be found under **Reports.**, but in summary, to create a report that exports your outcomes, you should select the report type 'single' and should check the 'outcomes' box when running the report. These reports enable you to export all relevant data about each outcome as well as study level data that can be used as covariates in a regression. In order to facilitate the use of these data in other software packages, the application of a given code to a study is indicated by a '1' in the cell (rather than the word). All outcome classification codes are also available in this report, again, in order for them to be used either as covariates, or to be the basis for sub-group analyses in whichever statistical software is used.

Meta-analysis training

To help understand how meta-analysis works a training section has been added where new and existing data can be manipulated to see the affect different changes will make. This can be found on the 'Meta-analysis training' tab of the Home panel.

Click on the button labelled **Load data** and pre-existing data is loaded into the system. Data from 6 studies is loaded. To change the data in a cell, double click the cell and edit the contents. To add a new study click on the button labelled **Add study**. You can delete selected studies or all studies using the **Delete highlighted** and **Delete all studies** buttons.

To run a Meta-analysis select the studies to include and click on the **Calculate** button. Data and forest plots will be displayed for both Fixed effect and Random effects models. A Funnel plot will also be calculated and displayed.

Text Mining

Text mining is a new feature introduced with EPPI-Reviewer 4 and is leading to new possibilities in the field of systematic reviewing.

It can assist with searching by identifying significant terms in the documents you have already included.

It can also be used in prioritising your work by identifying items most likely to be 'includes' base on previously included documents.

EPPI-Reviewer gives you access to a number of different term extraction engines that will extract or mine relevant terms from the abstracts.

To access the text mining functions select the **Find more documents like the ones** icon from the top of the Documents tab.

	The **Find more documents like the ones** listed can be found at the top of the Documents tab of the Home panel.

Clicking on this icon opens the **Find similar documents** window.
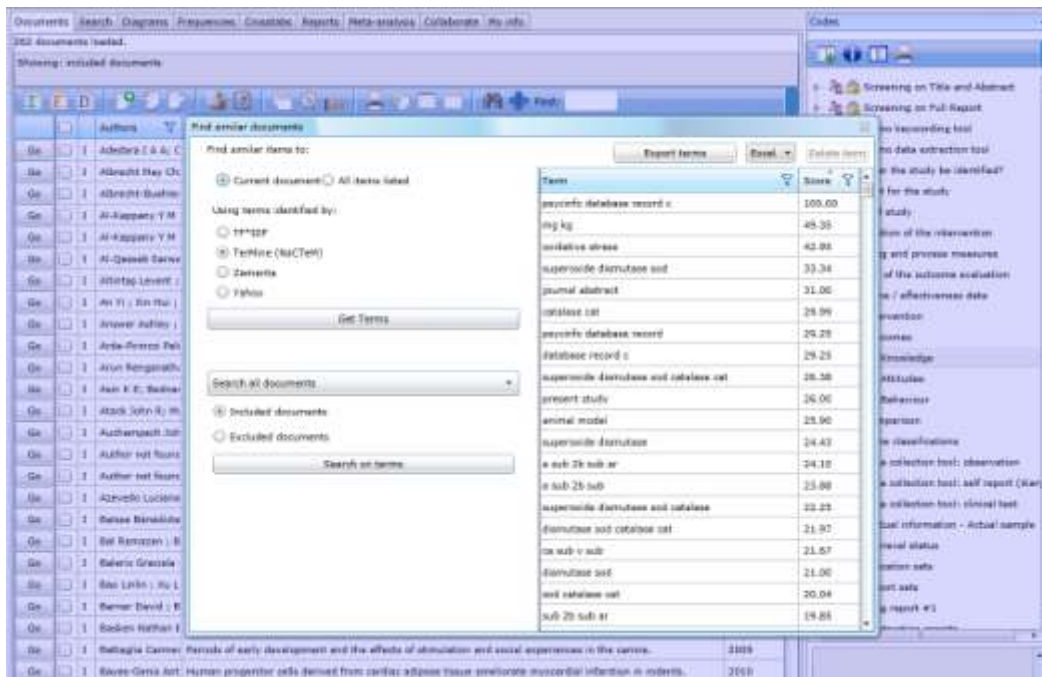
The user has access to four text mining engines.

- TF*IDF
- TerMine (NaCTeM)
- Zemanta
- Yahoo

TF*IDF - Term Frequency–Inverse Document Frequency, is a numerical statistic which reflects how important a word is to a document in a collection or corpus. It is often used as a weighting factor in information retrieval and text mining. The tf-idf value increases proportionally to the number of times a word appears in the document, but is offset by the frequency of the word in the corpus, which helps to control for the fact that some words are generally more common than others. (from Wikipedia - http://en.wikipedia.org/wiki/Tf%E2%80%93idf).

EPPI-Reviewer uses the MS SQL TF-IDF functionality where the TFIDF of a Term T = (frequency of T) * log((#rows in Input) / (#rows having T)). Further details can be found at http://msdn.microsoft.com/en-us/library/ms141809.aspx

TerMine – TerMine functionality is provided with permission from the National Centre for Text Mining (NaCTeM) , Manchester, UK (http://www.nactem.ac.uk/). Termine (http://www.nactem.ac.uk/software/termine/) is a Term Management System which identifies key phrases in text. The TerMine service integrates C-Value multiword term extraction and AcroMine acronym recognition. An analysis result will be a list of candidate multiword terms and their C-Value scores.

Zemanta – Zemanta (http://www.zemanta.com) provides a web service with named entity extraction and known phrases extraction from user supplied text. (description from Breda Wiki - http://neuro.imm.dtu.dk/wiki/Zemanta).

Yahoo – The Yahoo Term Extraction API allows users to perform content analysis by providing a list of significant words or phrases extracted from a larger content. It is one of the technologies used in Yahoo! Search.

The extraction engines can be applied to all documents or selected documents.

The **Current document** option will run the engine again the selected document.

The **All items listed** option will run the engine against all items on the documents tab.

To extract some terms select a term extraction engine, such as TerMine, from the radio button list. Let's apply the TerMine engine to all of the studies so select 'All items listed' from the radio button list. Now click on **Get Terms**.

The results are now displayed along with a score. This score, in the case of TerMine, is a combination of a number of factors including:

1. the occurrence frequency of the candidate term
2. the frequency of the candidate term as part of other longer candidate terms
3. the number of these longer candidate terms
4. the length of the candidate term

The table of terms and scores can be exported in a number of different formats.

Using text mining

One way to make use of text mining is to let it help you identify documents that are potentially relevant based on items that you have already identified as relevant. This is particularly useful when a review has many tens of thousands (possibly hundreds of thousands) of items. It may not be possible to examine every item and being able to prioritise the items to look at will ensure your resources are used most efficiently.

To begin, the user should create a random sample of items. This can be done using the **Assign documents to specified codes randomly** function. The larger you can make the sample, the more accurate it will be. A good start may be a sample of 1000 items. It is very important that the sample is random as it will be used to estimate the percentage of your items that are 'includes'.

You should now apply your inclusion/exclusion criteria to that sample. When you are finished you will have a number of 'included' items and will be able to calculate the percentage of the items that are includes.

Next, you should run the text mining functions against your included items. This will help identify terms and ideas that are representative of a typical 'included' item. In the example below TerMine has been used and the terms are displayed on the right side of the **Find similar documents** window.

If there are terms in the list that are not representative of your topic you can delete those terms using the **Delete term** button. This will give you a more accurate list of terms.
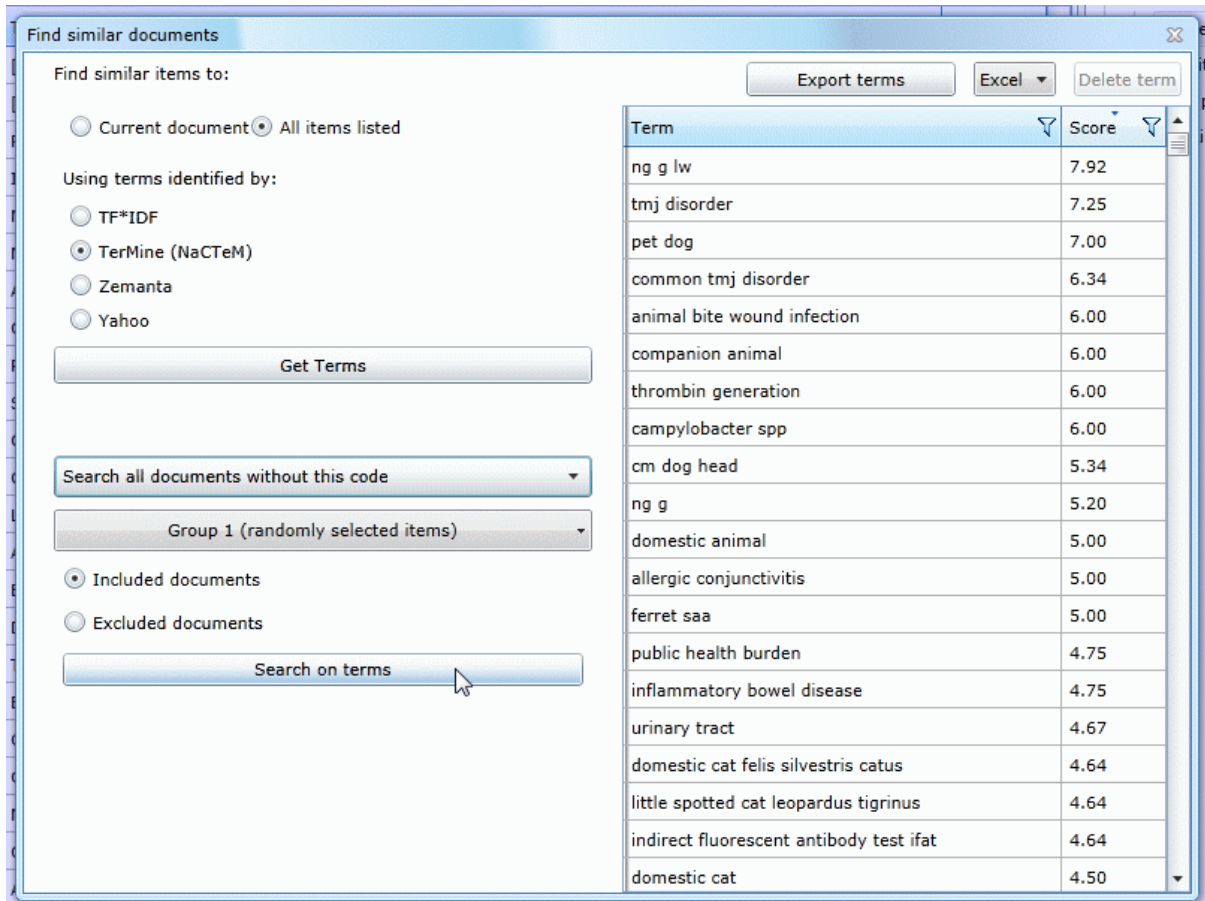
Finally, you want to **Search on terms**. You can tell the program to search through all of the items that you have not examined yet to identify the ones that have terms similar to what were identified by the text mining engine.

If you created your random sample using the **Assign documents to specified codes randomly** function then you will have a code identifying those items. If you limit the **Search on terms** to **Search all documents without this code** and select your allocation code (in this example it is called **Group 1 (randomly selected items)** the program will search through all of those remaining items.

The results of the search will be placed in the Search tab under a search called **Term search**.
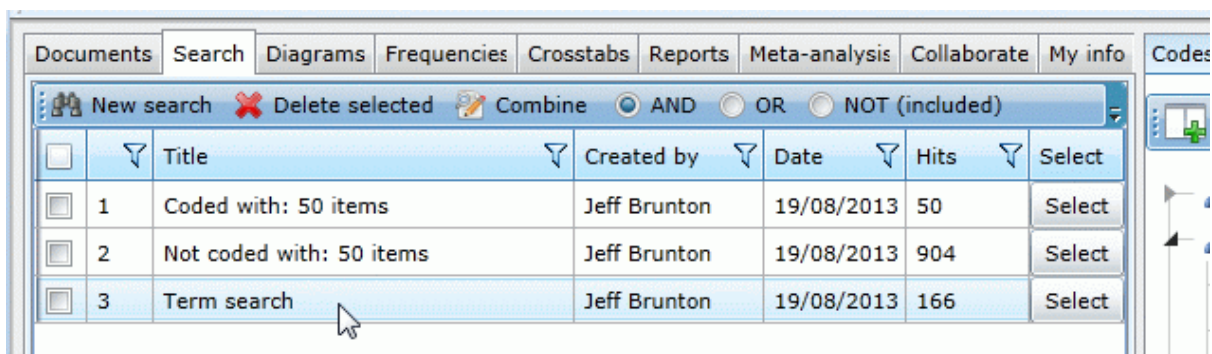
This search will be ordered from the item most likely to be an 'include' to least likely. If you proceed through the list in the order provided you are more likely to find potentially relevant items.

If you compare the number of items to examine with the percentage of potentially relevant items that you calculated from your random sample you can also get an estimate of how far you need to

move through your list of items before the chances of finding an included item approaches nil (i.e. the law of diminishing returns).

This process can be carried out in an iterative fashion. The more items that you have identified as 'includes', the more accurate the list of terms become. As the number of includes increase it might be useful to **Get terms** again based on those new items to optimise your list of terms.

Another way of using the text mining functions is to use the new terms to identify concepts that you may not have included in your original database searches.

Auto-Coding or Clustering

EPPI-Reviewer can categorise imported items into clusters based on the text in the abstracts. Automatic document clustering, using text mining, is one way of describing the range of studies you have identified at the click of a button. Text mining can assist with searching by identifying significant terms in the documents you have already included. Clustering is taking it step further by taking the extracted terms and coding the items into a tree structure consisting of the extracted terms that can be searched and manipulated. This is done using the Lingo3G clustering engine.

To auto-code references click on the **Automatically generate codes** icon on the Documents tab of the Home panel. The 'Automatically code documents' window will appear where you can set the constraints of the clustering. The options are:

- Maximum hierarchy depth:
    - Default 2.0
    - Determines how deep in the code tree to go
- Minimum cluster size
    - Default 0.0 (values 0.0 to 1.0)
- Maximum cluster size
    - Default 0.35 (values 0.0 1.0)
- Single word label weight
    - Default 0.5
    - How the minimum label length is weighted.
- Minimum label length
    - Default 1.0
    - The minimum number of words in a cluster

You can either select the items to cluster ahead of time or run it on all included items. Click on **Cluster documents** and the newly created codes will appear in the Codes tab of the Toolbox panel in a code set called 'Lingo3G clusters'.

Now that the items are coded with the extracted terms the items can be searched and manipulated similar to any other coded item.

This clustering functionality becomes useful when dealing with search results that are in the range of many thousands. It allows you to quickly categorise, or 'Auto-code' the terms contained in the documents and identify the most relevant documents to your subject.

Further details of the Lingo3G clustering engine can be found in the EPPI-Reviewer 4 reference manual.

Translations – Title and Abstract

EPPI-Reviewer 4 will translate your title and abstract. The system will automatically detect the source language and allow you to select the language you would like it to be translated to.

The translation function can be found in the **Document details** window under the **Citation details** window.
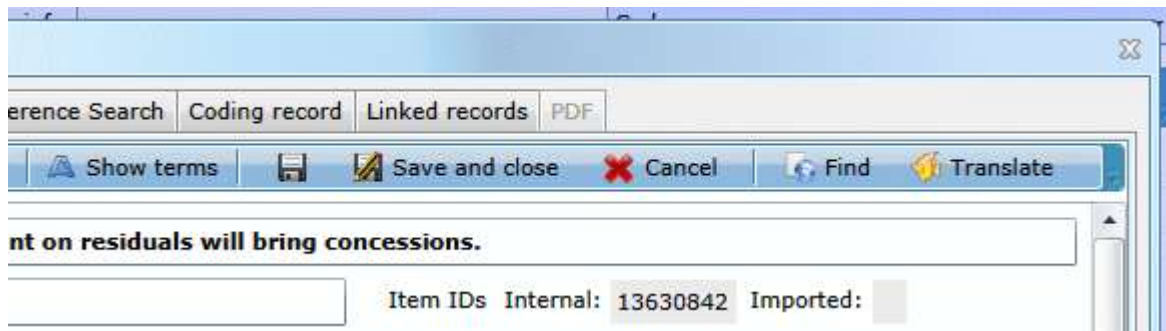
Clicking on **Translate** makes a sub-menu appear that allows users to pick the destination language.
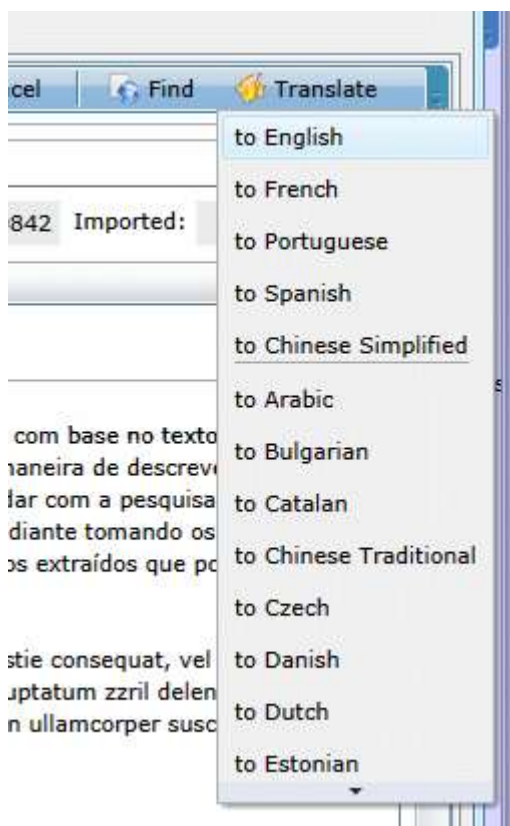
This system relies on the Azure Translator from Microsoft, which offers a computer-generated translation that should aid assessment as to whether the current citation is relevant for a given review. As a result, the list of languages is limited to those available on the Azure service. For

convenience, the list of languages shows the more common languages on top, followed by all the other languages in alphabetical order.

Clicking on a "to {this language}" option on the sub-menu will generate the translation and automatically save it as additional text on the top of the Abstract. The translated text is delimited by the "[Translated title]", "[Translated abstract]" and "[End translation]" tags. No direct "undo" is provided, but in the case the translation is unsatisfactory it is always possible to edit the abstract in the Abstract box and remove the unwanted translation.

Key term highlighting

A popular function to assist in screening or any other type of coding is the **Key term** highlighting function. This function will allow you to select and highlight in **green** terms that are relevant and highlight in **red** terms that are not relevant. By drawing your visual attention to particular key terms in the title and abstract you may be able to more quickly comprehend the content of the text.

To use this function click on the **Show terms** button (located to the right of the **Next** button). When you click on this button it will change to **Hide Terms** as displayed below.
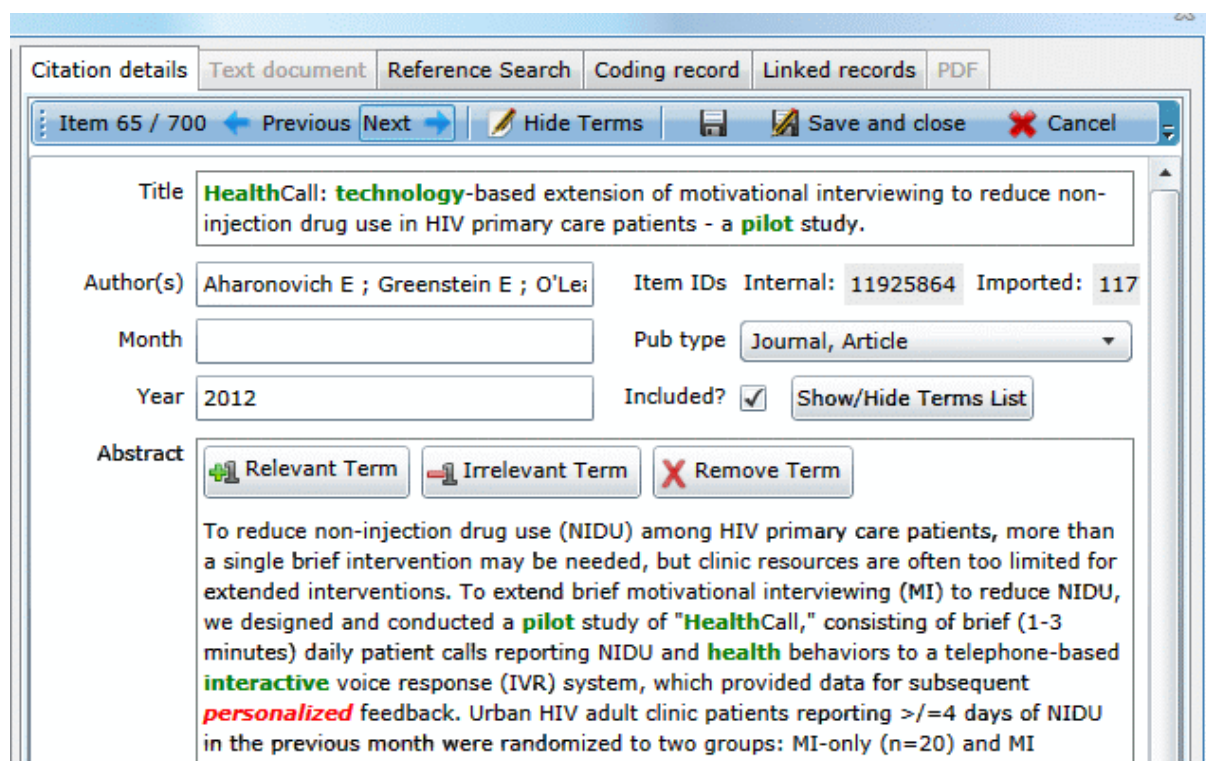
You can now select a relevant or irrelevant term from the displayed title and/or abstract and click on one of three buttons. You can choose between "Relevant Term", "Irrelevant Term" and "Remove Term". Only exact matches will be are shown, wildcards are not implemented and the system ignores word boundaries. For example, if **term** is listed as relevant the phrase "highlighting all terms in the abstract" will be shown as "highlighting all **term**s in the abstract".

To edit the list of terms you can click on the **Show/Hide Terms List** button. The list will appear on the left side of the screen temporarily hiding the code-trees.

You can use the list to edit the terms, change their relevant/irrelevant status and delete them. The changes will be immediately reflected in the Title and Abstract fields.

Line-by-line PDF / Inductive coding

EPPI-Reviewer 4 has inductive coding functionality to allow line by line coding of textual data and organising and structuring these codes graphically into 'conceptual relationship diagrams.

Coding textual data

Coding the textual data involves examining the text of the study, highlighting certain passages and applying codes to those passages to identify descriptive and analytic themes.

To begin you may want to first create a new codeset in the Codes tab of the Toolbox panel. For clarity it could be called something like 'Inductive coding'. Add 1st level child codes to the code set that describe the different themes you are looking for. 2nd level child codes relating to the actual text can be dynamically added at the time of coding. Please note that it is not necessary to create a new inductive coding codeset; the inductive codes can be part of an existing codeset if you prefer.

Select the document that you are going to code in the Documents tab of the Home panel. This will take you to the Document details window. You need to upload a full text version of the study to

work with. To upload a file click on the button labelled **Upload**. This will open the 'Upload File' window. Click on the **Select file** button and then access the file to upload from your computer. Once the file is selected click on **Save** to upload it to your review. It is now displayed in the table of uploaded files.
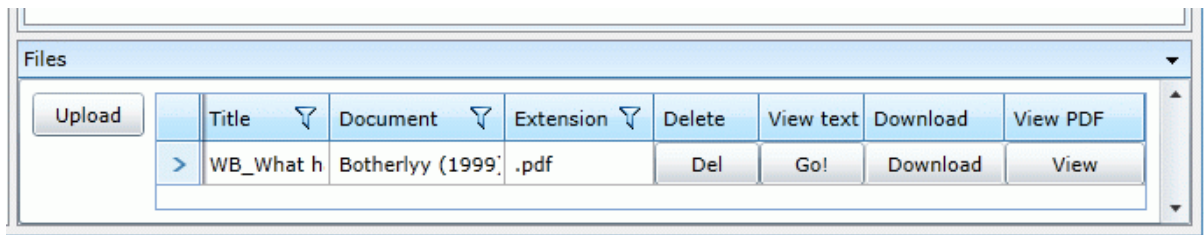
You can work on many different types of documents such as pdfs, Word docs and text.

PDF documents

With pdf documents you can select text and apply code to that text directly on the pdf. The pdf retains all of its formatting while you are working in it.

To work within the pdf, click on **View** in the 'View PDF' column to open the document. It will be displayed in the PDF tab.
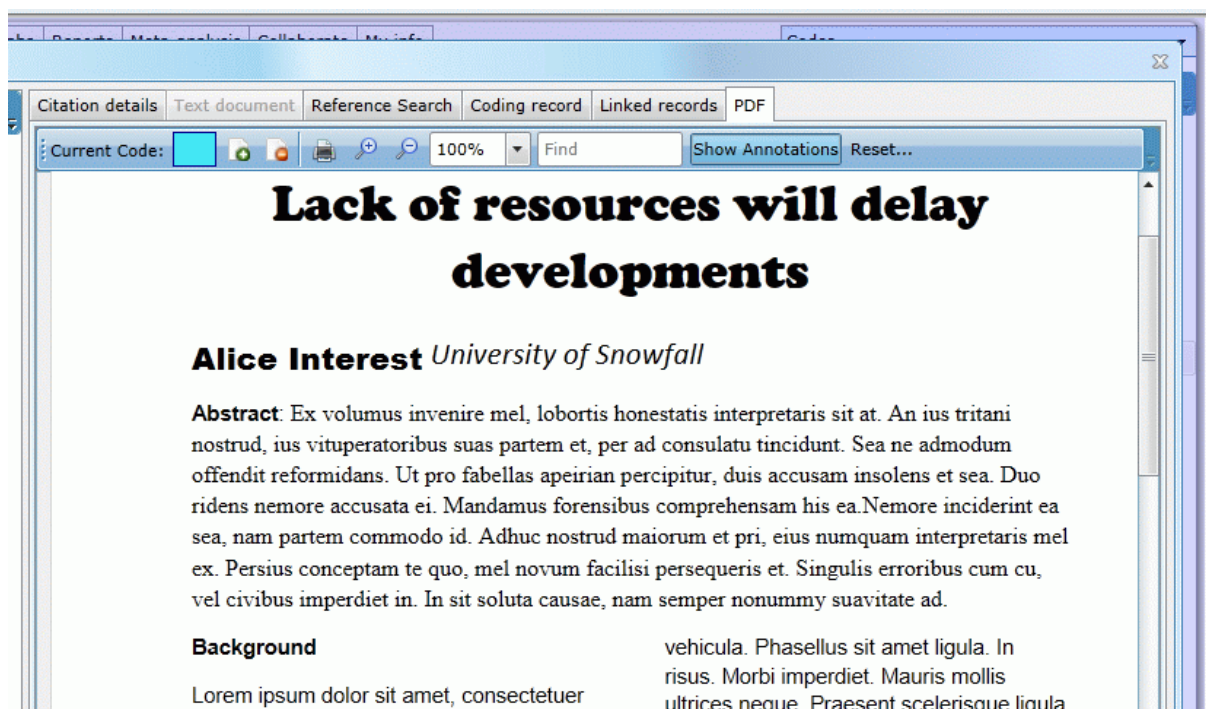
To assign a code to some selected text highlight a relevant section of document. Next, select the appropriate code (or create a new one) in the inductive coding codeset. The selected code will be displayed at the top of the page in the cyan coloured box. Finally, click on the Add code to selected text icon. This is the icon that has the small green plus symbol. This action will assign the selected code to the highlighted text. You can also click on the 'a' key to assign the code to the highlighted text.
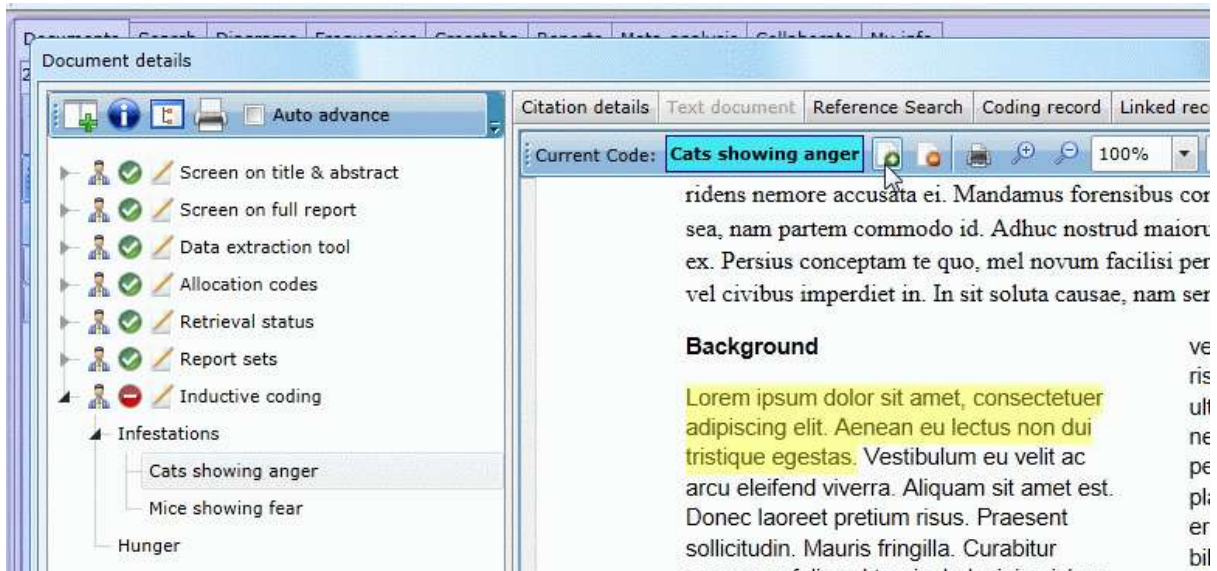
The selected text will now be highlighted in yellow.

Removing a code from highlighted text is done the same way except you would select the 'Remove code from selected text' icon. As before you can also click the 'd' key in place of the icon.
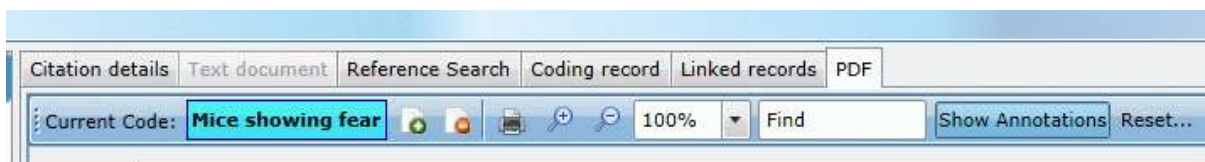
In the pdf tab you can zoom in and out using the + and – microscope icons or select a specific zoom percentage. You can also search the document using Find text box.

Annotations

PDF annotations are short comments that reviewers may add to a PDF document. They should not be used to hold coding information as they cannot be searched, exported or included in reports.

To add an annotation click the **Show Annotations** button to display the annotations column. Now double click in the column where you want the annotation to display. This will open the 'New Annotation' window where you can enter you comment and then click **Save**. The annotation will be displayed in the semi-transparent right hand column.

Double clicking an existing annotation will allow you to edit or delete it. Annotations can be dragged up and down within a page but cannot be moved to a new page.

When the annotations are visible the annotations button will change to **Hide Annotations**. Clicking on the annotations button now will hide the annotations column.

Reset

PDF documents can have a very complex internal representation of text and layout and interpreting this information can sometimes be difficult. If a user selects a section of text that contains hidden characters it can be difficult to later remove coding from that hidden text. To overcome this issue there is a reset option.

If you select the code you want to remove and click **Reset…** the Reset Pdf Coding window will appear. This window shows the current code and the current page number. You can then choose to remove the code from current page or the entire document.
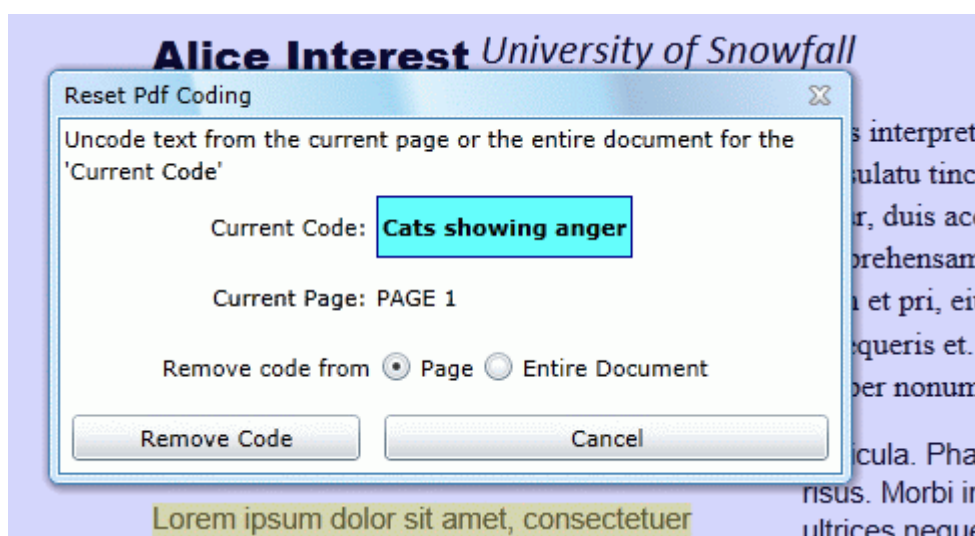
Other types of documents

With other types of documents such as text files or Word files you will need to work within the extracted text of the document.
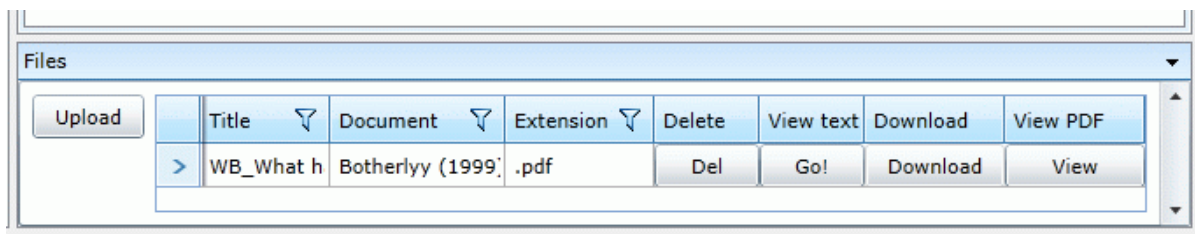
To extract the text from the document click on **Go!** in the 'View text' column. The extracted text, minus its formatting, will be displayed the 'Text document' tab.

You can now select text by holding down the left button of the mouse and sliding across the text. When you have selected some text, find the appropriate code on the left and highlight it, right click on the code and select **Code selected text**. If you need to add a new code select **Add child code**.
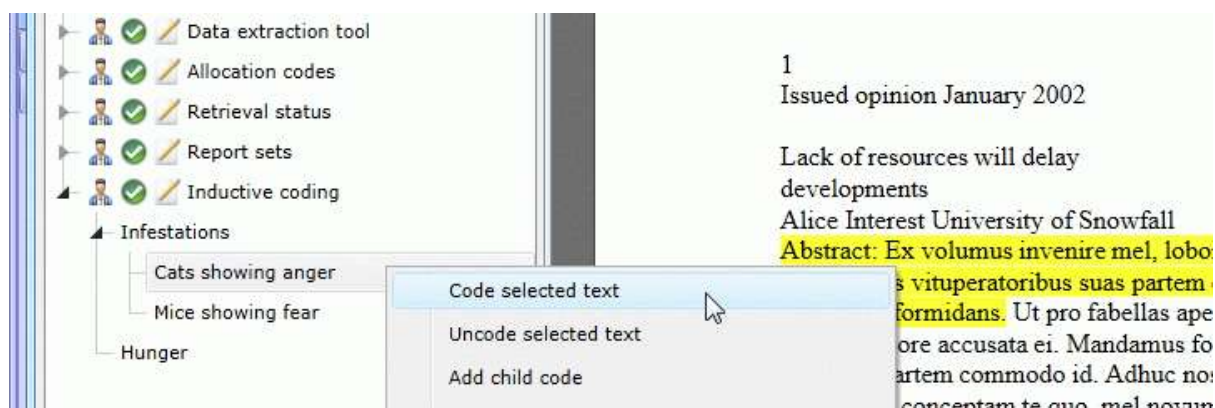
Removing a code from text is done the same way except you should select **Uncode selected text**.

Inductive coding reports

To see what text has been assigned to a particular code, just select the code from the left hand side of the screen. The applicable text will be highlighted in yellow throughout the document.
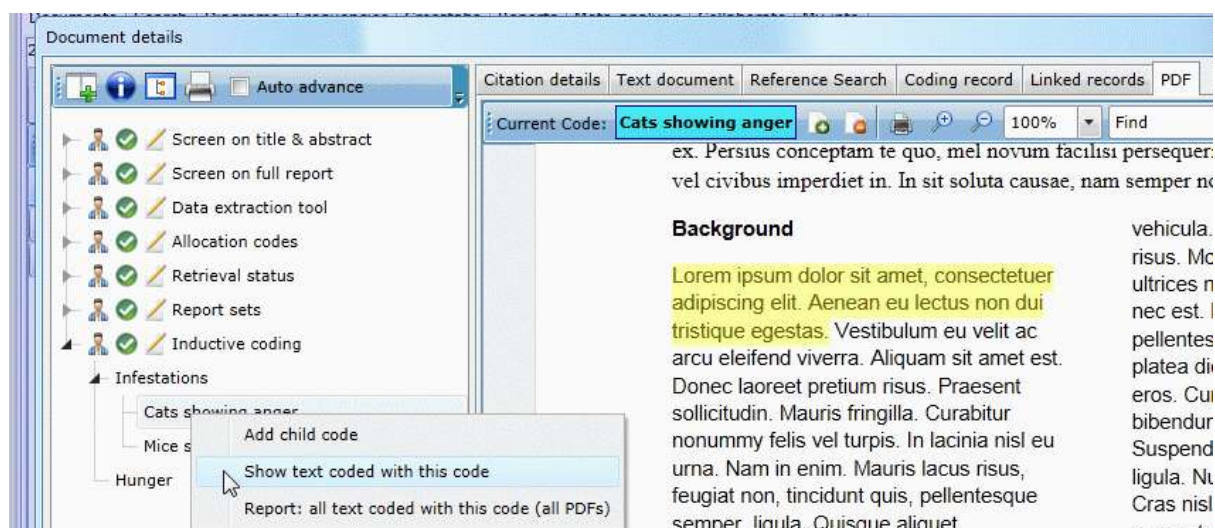
 If you select **Report: all text coded with this code (all PDFs)** all instances where this code has been applied across all studies will be displayed in the report viewer.
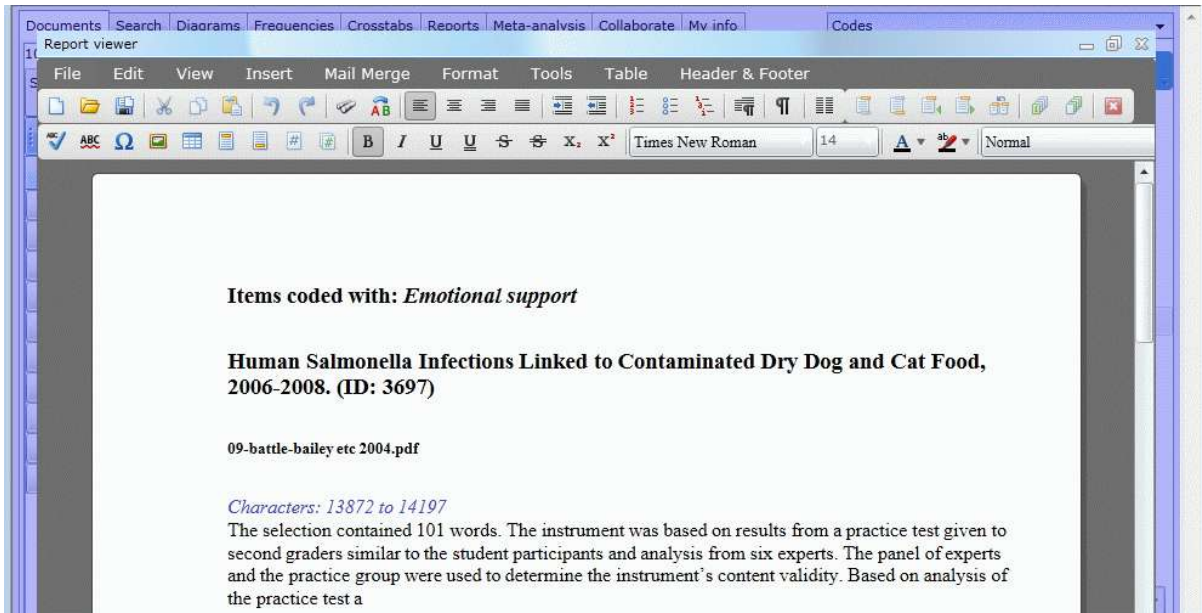
The report viewer is a text editor that will allow the user to format and print the report.

The selected text can also be displayed in the configurable reports that you can create in the Reports tab. If you minimise a report column to edit the columns details you specify whether the selected text will be displayed in the report.
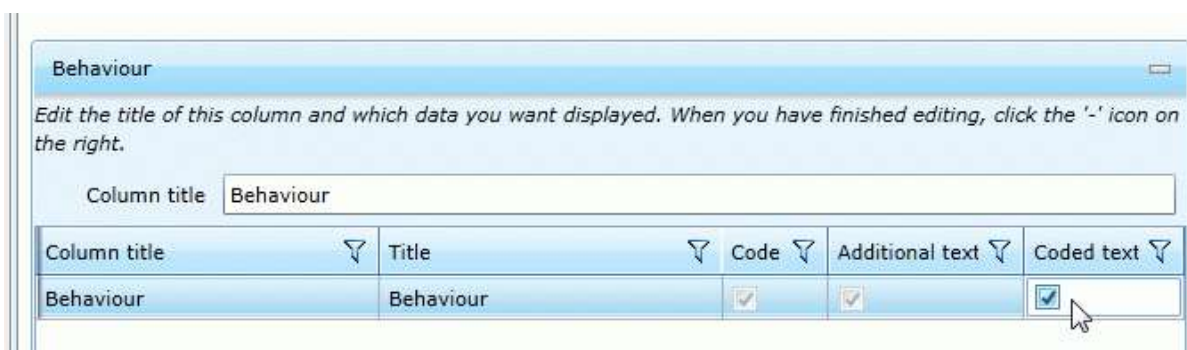
The selected or **Coded text** (as labelled in the column) is displayed by default and can be turned off by un-clicking the **Coded text** checkbox.

Creating conceptual diagrams

After codes have been applied to the textual data EPPI-Reviewer can represent the relationships between those codes in conceptual diagrams.

Select the Diagram tab in the Home panel. At the bottom of the screen click the button labelled **New** to create a new diagram.

Be sure the Codes tab is visible in the Toolbox panel. Expand your inductive coding code set and highlight a code that you would like to show in your diagram by selecting it. Right click on the code and select **Insert in diagram** from the menu.

The code will be displayed as rectangle in the Diagrams tab. If you click on the new rectangle and then click in the centre of it you can move it around the screen by holding down the mouse button. If you wish to stretch it, select either a corner or side and drag it out. You can change its shape by selecting a new shape from the drop down menu at the top of the screen. You can also change the

background colour or text colour from the menus at the top of the screen. To delete a shape, select the shape and click on the button labelled **Delete** at the bottom of the screen.

Once you have placed your codes in the diagram as images you can connect them with arrows to show the relationships. To draw an arrow, left click in the centre of one shape and drag the mouse into the centre of a second shape. An arrow will be drawn between the two shapes.

At any time you can save your diagram by clicking on the **Save** button at the bottom of the screen. The **Save** function can also behave like a **Save as** function if you change the name in the **Save diagram** window. It won't remove the original file so you will end up with the old and new version. To retrieve a saved diagram click on the **Load** button. You can the select a diagram from a list of your saved diagrams.

Diagrams

The diagram functionality described above can be used for more than just inductive coding. Flow charts of your review processes can be displayed using the drawing tools.

To insert the all of the child codes of codeset into the diagram, right-click on the codeset and select **Insert child codes into diagram**. All of the child codes are placed in the diagram. You can arrange them by clicking on a code and then dragging it.

To display the code counts for a particular code click on the Add code counts button at the top of the diagram. This will display the number of times the code was selected in the boxes.
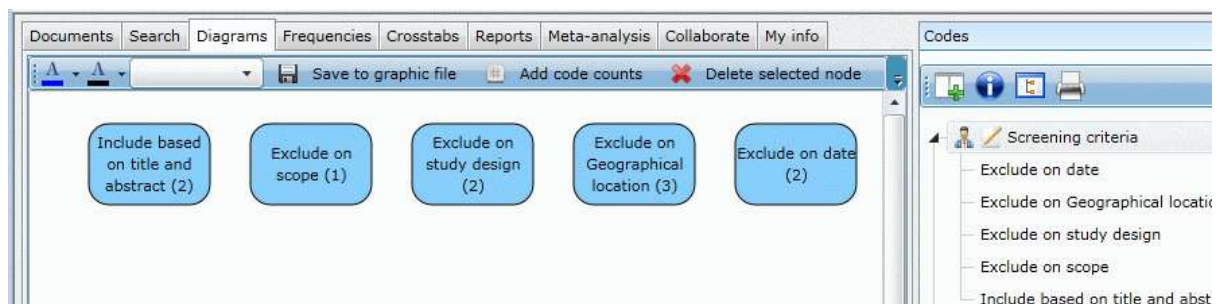
This method can be used to create a complete flow chart of your entire review.
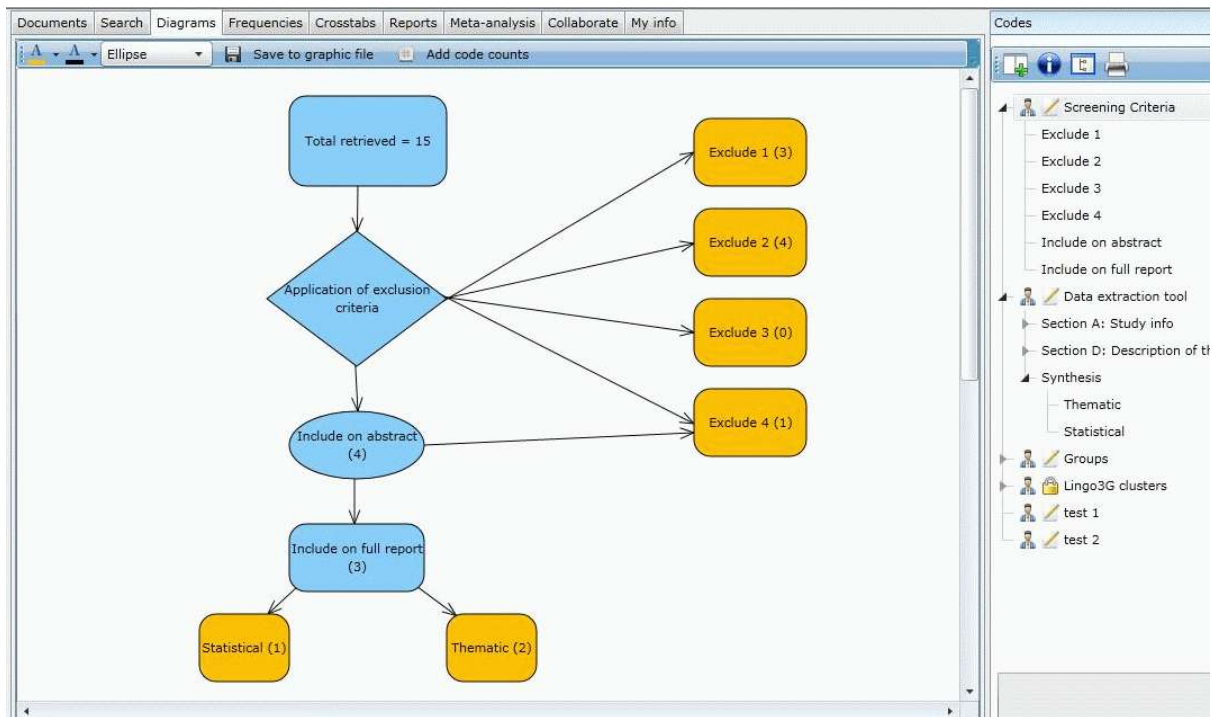
Expiration of user accounts and shareable reviews

User accounts and shareable reviews have an expiry date associated with them. If the user goes to the My info tab they will see listed at the top of the screen the date their account expires and the date the review expires, if it is a shareable review.

When your user account expires you will be restricted to read-only access to EPPI-Reviewer 4. Read-only access will allow the user to look at the data and carry out certain operations on the data such as running reports but they will not be able to add new data such as new records and new coding. Functions that cannot be access will be greyed out in the interface.

If a shareable review expires it will become read-only with the same limitations as someone trying to access it with a user account that has expired.

When a user account is expired for more than 2 months the user will not be able to log into the software. If they require read-only access we can set their account expiry date to the present day - 1 (giving them another 2 months). We can do that as often as a user requests.

You can regain full access to EPPI-Reviewer 4 by extending the expiry date. This will require purchasing further account access or review access if you have a shareable review.

Our online payment system is active allowing you to extend your account or shareable review expiry date. Online payments can be made on the **EPPI-Reviewer 4 review and account manager** than can be found on the **EPPI-Reviewer 4 gateway** (http://eppi.ioe.ac.uk/cms/er4). If you prefer the more traditional invoice and payment method you can contact us at **EPPIsupport@ioe.ac.uk** to make these arrangements.

Appendix A: Example review

Layout of a systematic review in EPPI-Reviewer 4

The following pages and figures show a 'typical' systematic review as it might be set up in EPPI-Reviewer 4. Although there may not be such a thing as a 'typical' systematic review, most will include some, if not all, of the steps listed below.

The process flow of this example includes EPPI-Reviewer screenshots of some of the steps from this list.

1. Importing of search results
2. Duplicate checking
3. Code set creation
4. Allocating items for double screening
5. Double screening on title and abstract to identify potential includes
6. Reconciling disagreements in double screening
7. Full text document retrieval
8. Allocating potential includes for double screening on full text
9. Double screening on full text to verify potential includes
10. Allocating items for keywording
11. Mapping of included studies using a keywording tool
12. Running searches to identify items for detailed data extraction
13. Detailed data extraction
14. Input of numeric outcome data
15. Line by line coding of uploaded full text documents
16. Generating of reports
17. Running meta-analysis
18. Showing the work distribution in a diagram
19. Showing the process flow in a diagram

Importing of search results

In the manage sources window the search log fields should be filled in so there is a clear record of the sources searched and the search terms used. All import activity is also summarised in the Sources tab.

Duplicate checking

All duplicate groups should be checked and marked as completed. The number of duplicates is summarised in the Sources tab.

Code set creation

Codesets should be clearly labelled as to their purpose. Try to keep the code names to a reasonable length by using the description fields and avoid using more than 4 levels of hierarchy. Code sets should normally be set for single data entry unless double coding is being carried using that codeset.

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

Reviewers in this review

Reviewer	Id
Steven Startle	1512
Donald Soluable	1572
Alice Interest	1660

Coding assignments   Create new

Reviewer	Study group	Codes to apply	Allocated	Started	Remaining	
Steven Startle	Group 1 T&A	Screening on Title and Abstract	131	131	0	Delete
Donald Soluable	Group 1 T&A	Screening on Title and Abstract	131	131	0	Delete
Steven Startle	Group 2 T&A	Screening on Title and Abstract	131	131	0	Delete
Alice Interest	Group 2 T&A	Screening on Title and Abstract	131	131	0	Delete
Steven Startle	Group 1 Full report	Screening on Full Report	53	53	0	Delete
Alice Interest	Group 1 Full report	Screening on Full Report	53	53	0	Delete

Create comparison

Codes applied from this set	Reviewer 1	Reviewer 2	(Reviewer 3	(Only studies	Date	Quick report	stats	Delete
Screening on Title and Abstract	Steven Star	Donald Solu		Group 1 T&A	23/02/2011	Run	View	Delete
Screening on Title and Abstract	Steven Star	Alice Intere:		Group 2 T&A	23/02/2011	Run	View	Delete
Screening on Full Report	Steven Star	Alice Intere:		Group 1 Full	24/02/2011	Run	View	Delete

Codes

- ► Screening on Title and Abstract
- ► Screening on Full Report
- ► Demo keywording tool
- ► Demo data extraction tool
- ► Retrieval status
- ▲ Allocation sets
  - ▲ Screening Title and Abstract
    - Group 1 T&A
    - Group 2 T&A
  - ▲ Screening Full Report
    - Group 1 Full report
  - ► Keywording
  - ► Data extraction
- ► Report sets

Codes | Sources | Review statistics

Status: Normal. Last Code Update: 12/04/2011. Latest changes are published in... **[Show More]** | User: Steven Startle | Review: EPPI-Reviewer 4 demo

Allocating items for double screening

Items for allocation should be arranged in their own allocation code set and clearly labelled as to their purpose. This makes the work allocations in the Collaborate tab easier to understand.

Double screening on title and abstract

Coding is carried out in the document details window. The items to code for an individual are retrieved in the Collaborate tab. Since double screening is taking place the items are not automatically marked as complete when codes are assigned.

Reconciling disagreements in double screening

Run a Create comparison in the Collaborate tab to generate a Quick report of the coding that has been carried out. The View stats function summarises the agreements and disagreements allowing you to 'complete' the agreements and reconcile the disagreements in the Comparison Reconciliation window.

Full text document retrieval

You should create a code set to mange the retrieval of full text documents. When a document is retrieved and uploaded into the system it can be marked as 'In file'.

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

Document details

Codes

Auto advance

Citation details | Text document | Reference Search | Coding record | Linked records | PDF

Reload Annotations Save New Annotation Delete Annotation — 100 % Pages: 117

IEG IFCs Results 2007.pdf

▶ Screening on Title and Abstract
▼ Screening on Full Report
  ☐ EXCLUDE on date [Info]
  ☐ EXCLUDE on target group [Info]
  ☐ EXCLUDE on intervention [Info]
  ☐ EXCLUDE on evidence [Info]
  ☐ EXCLUDE on country [Info]
  ☐ EXCLUDE not retrieved (give reason) [I
  ☑ INCLUDE on full study [Info]
▶ Demo keywording tool
▶ Demo data extraction tool
▶ Retrieval status
▶ Allocation sets
▶ Report sets

Include based on full report. Item ready for indepth review

Summary of Evaluation Report

This tenth IEG annual review of evaluation findings took stock of the perf o mance of 627 investment operations approved during 1991–2001 and evaluated in 1996–2006, and drew on other evaluative materials to highlight lessons and strategic implications for IFC going forward. The report's main findings were: (i) 59 percent of IFC-supported projects (65 percent by volume) achieved high development ratings at the project level; (ii) development outcomes and IFC profitability tend to go hand in hand; (iii) five factors—changes in business climate; type of industry sector; quality of the sponsor; level of product market, client company, and project type risks; and IFC work quality—have significantly influenced the development outcomes of IFC-supported projects; and (iv) IFC has generally made sound strategic choices.

(2) place emphasis on rural development, especially through support for agribusiness and rural microfinance projects; (3) pursue new incentives and mechanisms to enhance cooperation with the Bank in areas of synergy; (4) manage the frictions resulting from a combination of the decentralization process, scaling up of operations, and improving work quality; (5) ensure sound risk management systems, and develop risk mitigation products for clients, to cope with the risks emanating from the next correction in the global financial market; and (6) strengthen the capacity for evaluation and its application.

Draft IFC Management Response

Management appreciated IEG's evaluation, and agreed with the general direction of its report's recommendations. It took note of the overall IEG finding that IFC has had positive development impact

Files

Upload	Title		Document		Extension	Delete	View text	Download	View PDF
>	IEG IFCs Results 2007.pdf		Answer (2001)		.pdf	Del	Go!	Download	View

Status: Normal. Last Code Update: 12/04/2011. Latest changes are published in... [Show More] | User: Steven Startle | Review: EPPI-Reviewer 4 demo

Double screening on full text

Uploaded full text documents can be displayed in EPPI-Reviewer and shared among the review team during coding.

Running searches to identify items

To indentify items that will move forward in the process searches based on previous coding can be generated in the Search tab. All searches are recorded and listed in a table. Searches can be combined using Boolean operators.

Input of numeric outcome data

Outcome data from the studies can be entered during the coding process. Multiple outcomes, with different outcome types can be entered for the same item. Outcomes, Intervention, comparisons and outcome classifications can be predefined allowing quick retrieval during data input.
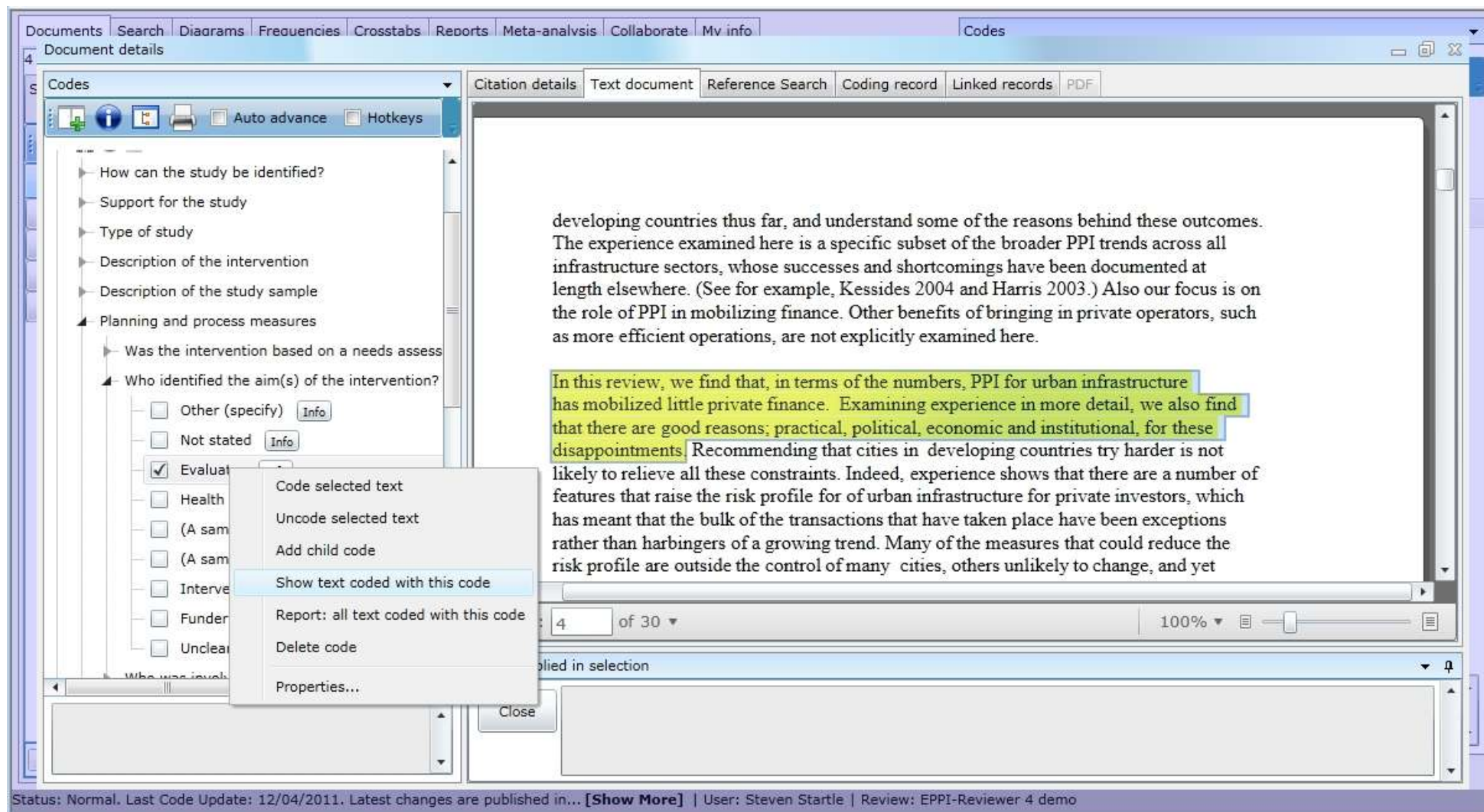
Line by line text coding coding

The textual content of uploaded full text documents can be highlighted and assigned codes. Reports can be generated to identify all text assigned a particular code. All inline text coding can be displayed when generating reports.

Setting up reports

Report structures can be created in a number of different configurable formats. The report structure can be saved and reused on different datasets.
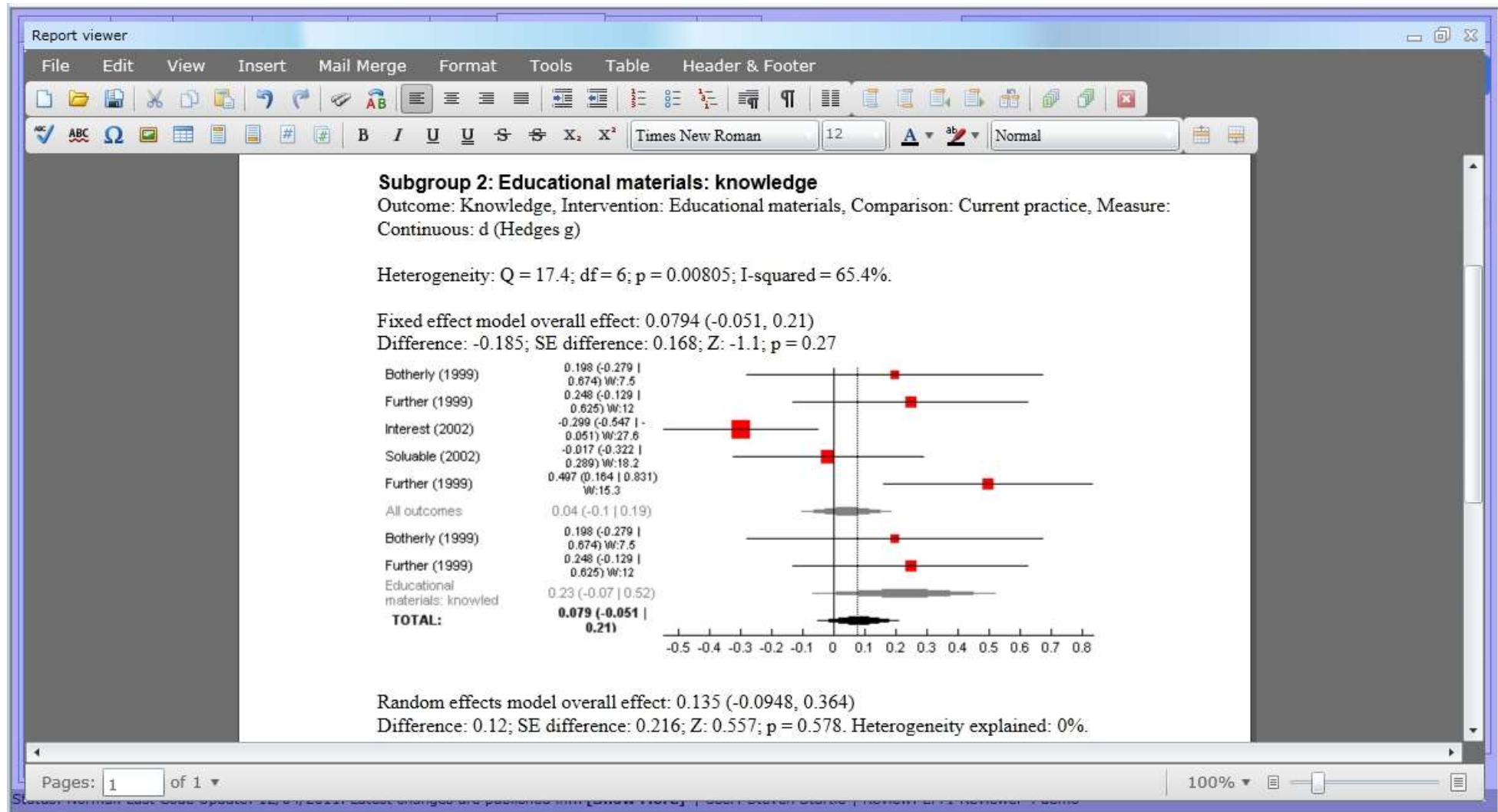
Running reports

Once a report structure is saved it can be run against different datasets. The generated report can be saved in a number of different file formats for direct insertion in the users final report.

Report viewer

File   Edit   View   Insert   Mail Merge   Format   Tools   Table   Header & Footer

Subgroup 2: Educational materials: knowledge
Outcome: Knowledge, Intervention: Educational materials, Comparison: Current practice, Measure: Continuous: d (Hedges g)

Heterogeneity: Q = 17.4; df = 6; p = 0.00805; I-squared = 65.4%.

Fixed effect model overall effect: 0.0794 (-0.051, 0.21)
Difference: -0.185; SE difference: 0.168; Z: -1.1; p = 0.27

Botherly (1999)	0.198 (-0.279 | 0.674) W:7.5
Further (1999)	0.248 (-0.129 | 0.625) W:12
Interest (2002)	-0.299 (-0.547 | -0.051) W:27.6
Soluable (2002)	-0.017 (-0.322 | 0.289) W:18.2
Further (1999)	0.497 (0.164 | 0.831) W:15.3
All outcomes	0.04 (-0.1 | 0.19)
Botherly (1999)	0.198 (-0.279 | 0.674) W:7.5
Further (1999)	0.248 (-0.129 | 0.625) W:12
Educational materials: knowled	0.23 (-0.07 | 0.52)
TOTAL:	**0.079 (-0.051 | 0.21)**

-0.5 -0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8

Random effects model overall effect: 0.135 (-0.0948, 0.364)
Difference: 0.12; SE difference: 0.216; Z: 0.557; p = 0.578. Heterogeneity explained: 0%.

Pages: 1   of 1 ▼   100% ▼

**Running a statistical meta–analysis**

Entered numeric outcome data can be used to run a statistical meta-analysis. Outcome data from different studies can be combined and the program returns the results for fixed and random effects models. Studies from the two selected meta-analyses can also be entered into a sub-group analysis.
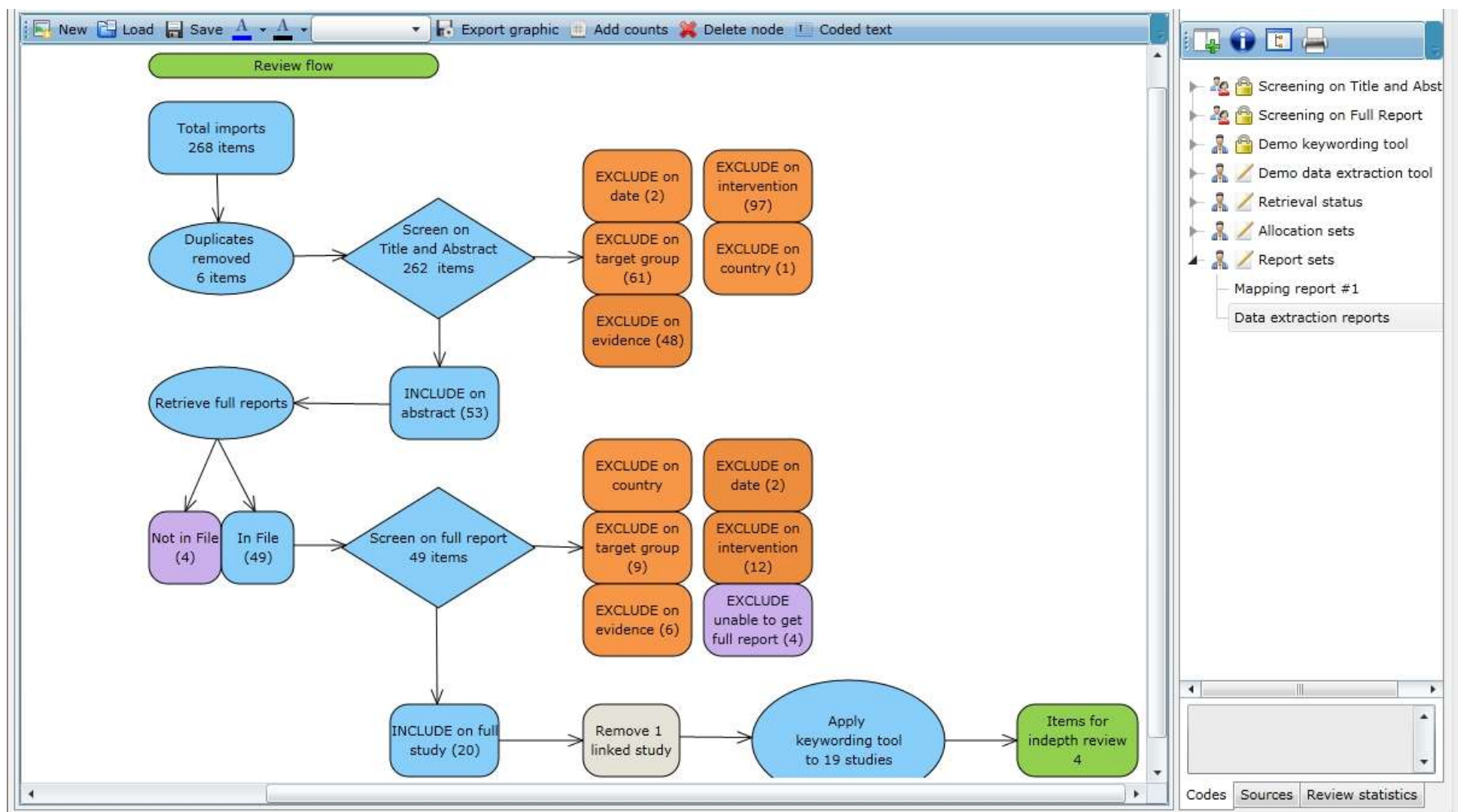
Process flow diagram

Most systematic reviews require a process flow diagram showing what took place during the review. The diagram function allows the user to pull their codes into the diagram and have the system add the code counts. Each cell is fully configurable and can be connected by arrows. The diagram can also be exported.
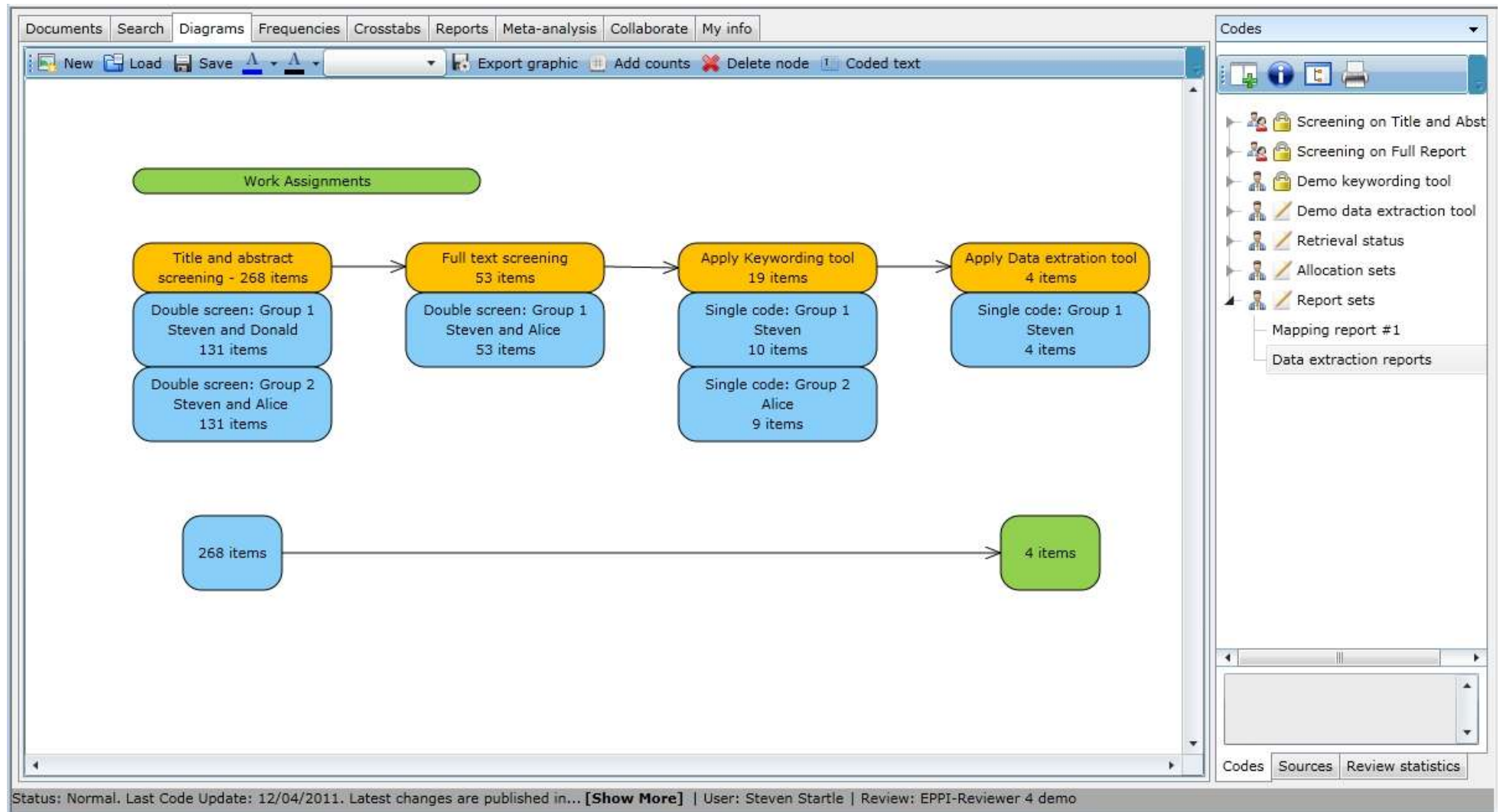
Work assignment diagrams

The diagram functions can be used in many different ways. One possible use is a visual representation of work assignments throughout the review process.