Institute of Education

UCL

Getting to know EPPI Reviewer

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Webinar
12/07/2016

EPPI CENTRE

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Outline

- Introductory overview of EPPI-Reviewer
- Integration with Archie and Revman
- More efficient screening using text mining & machine learning
- Quality assessment / data extraction in complex / qualitative reviews
- Advanced meta-analysis

A (very) quick overview of EPPI-Reviewer

EPPI-Reviewer: web-based review management tool

Searching and screening
Bibliographic information

↓

Characterising studies
Organises and applies substantive codes (keywording)

↓

Data extraction and quality/relevance assessment
Substantive codes and textual detail (data extraction)

↙ ↓ ↘

Numerical synthesis
Meta-analysis function

Narrative 'empirical' synthesis
Interrogation of codes and detail

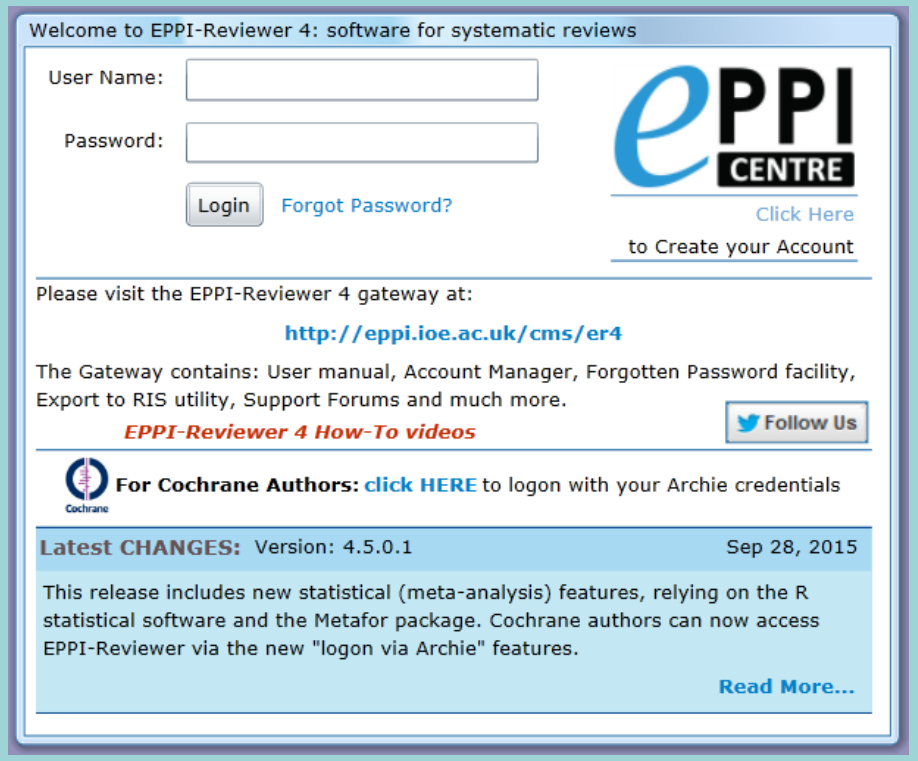
Thematic/conceptual synthesis
Inductive coding function

- ***Web-based browsing and interrogation of coding within and across reviews, and review reports and summaries***
- ***Online since 2000***

EPPI-Reviewer: How it Works

http://eppi.ioe.ac.uk/eppireviewer4/

1. Silverlight Web Application
2. Runs on the Desktop
3. Data comes from central server
4. Concurrent use:
    1. Data is saved in real time
    2. Last change is retained
5. Safety:
    1. Encrypted communication
    2. Backups
    3. Error Messages



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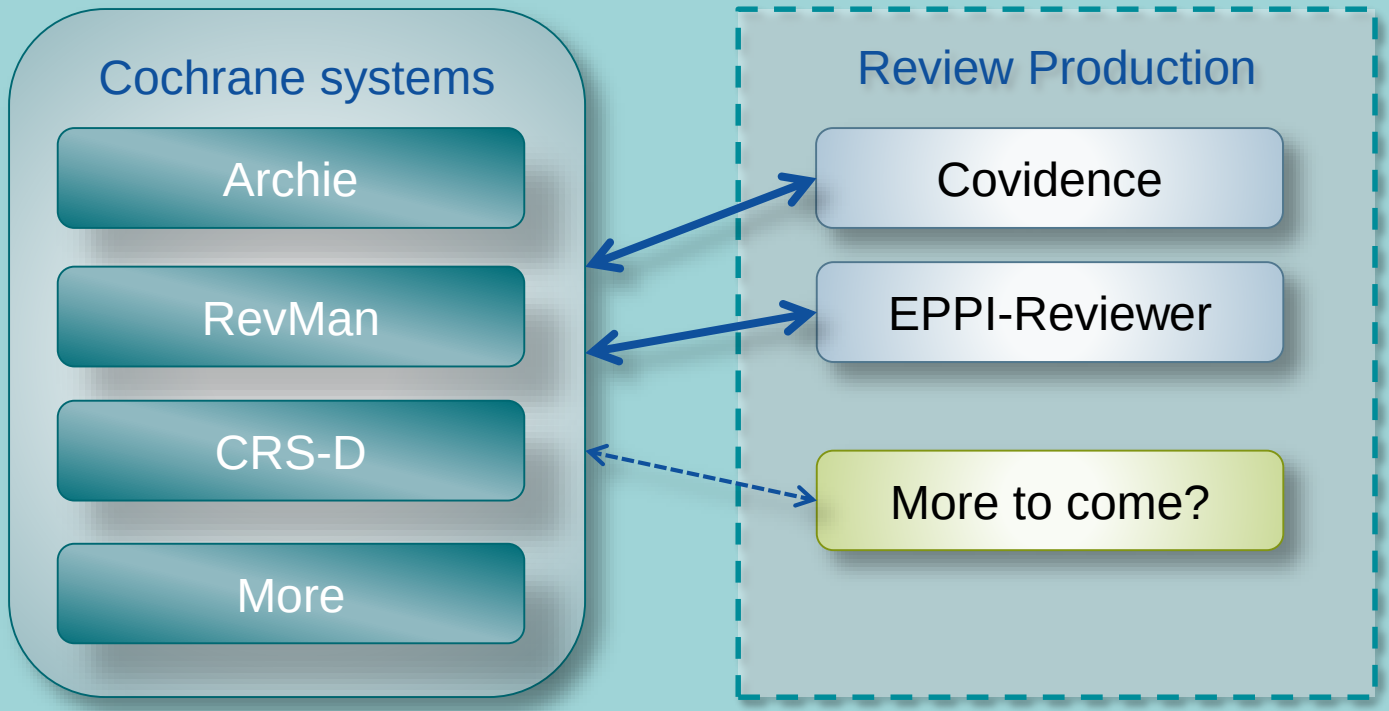
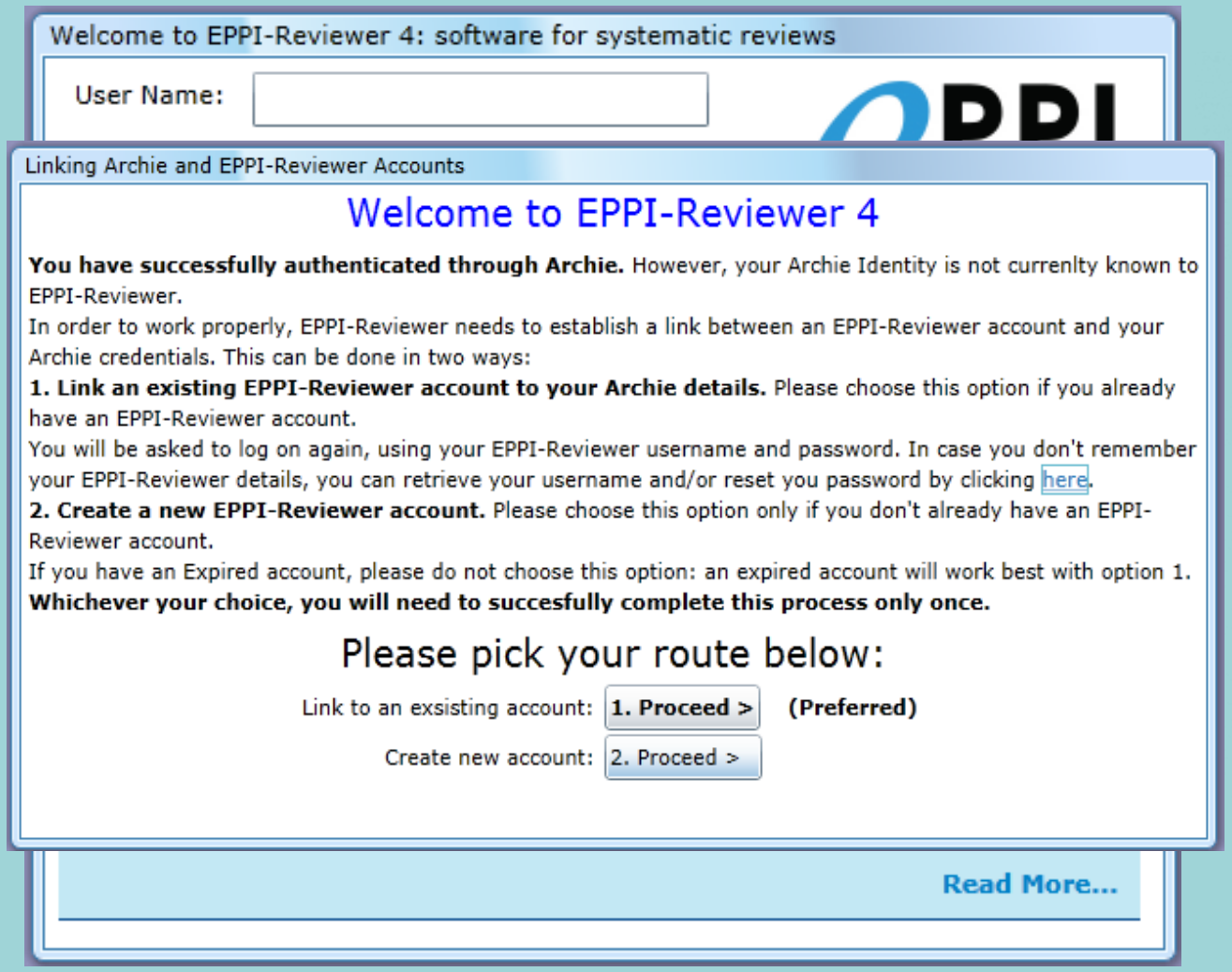
Interaction with Archie

Cochrane Author Support Tool (CAST) and more

Produce, write and maintain Cochrane reviews, using a range of intercommunicating tools.



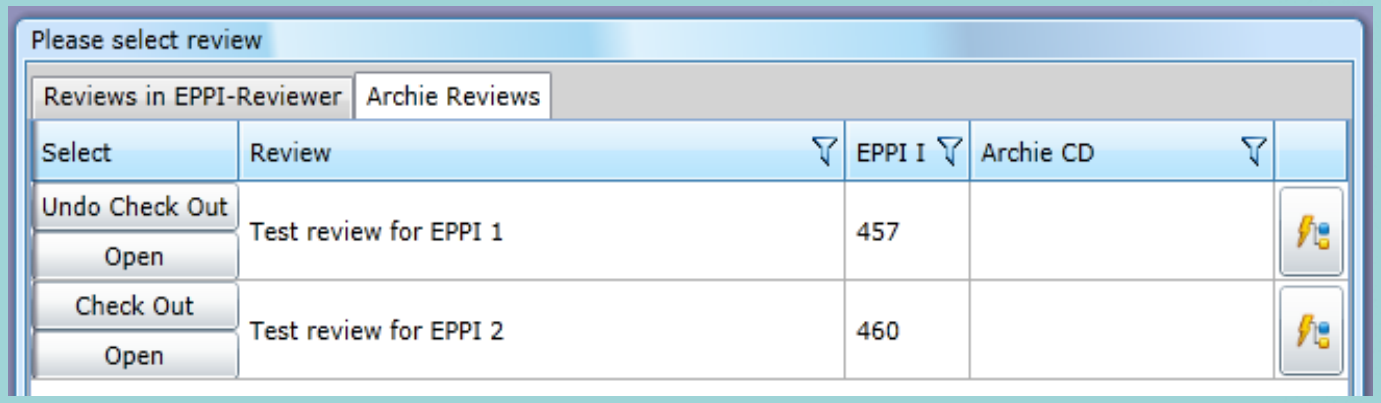
EPPI-Reviewer and Cochrane Systems



Cochrane

EPPI-Reviewer and Cochrane Systems

Manage reviews



Cochrane

1. Like in RevMan, you need to check it out.
2. Checked-in reviews are ReadOnly in EPPI-Reviewer
3. Archie controls who can open the review.
4. **No Other Data is Exchanged!**

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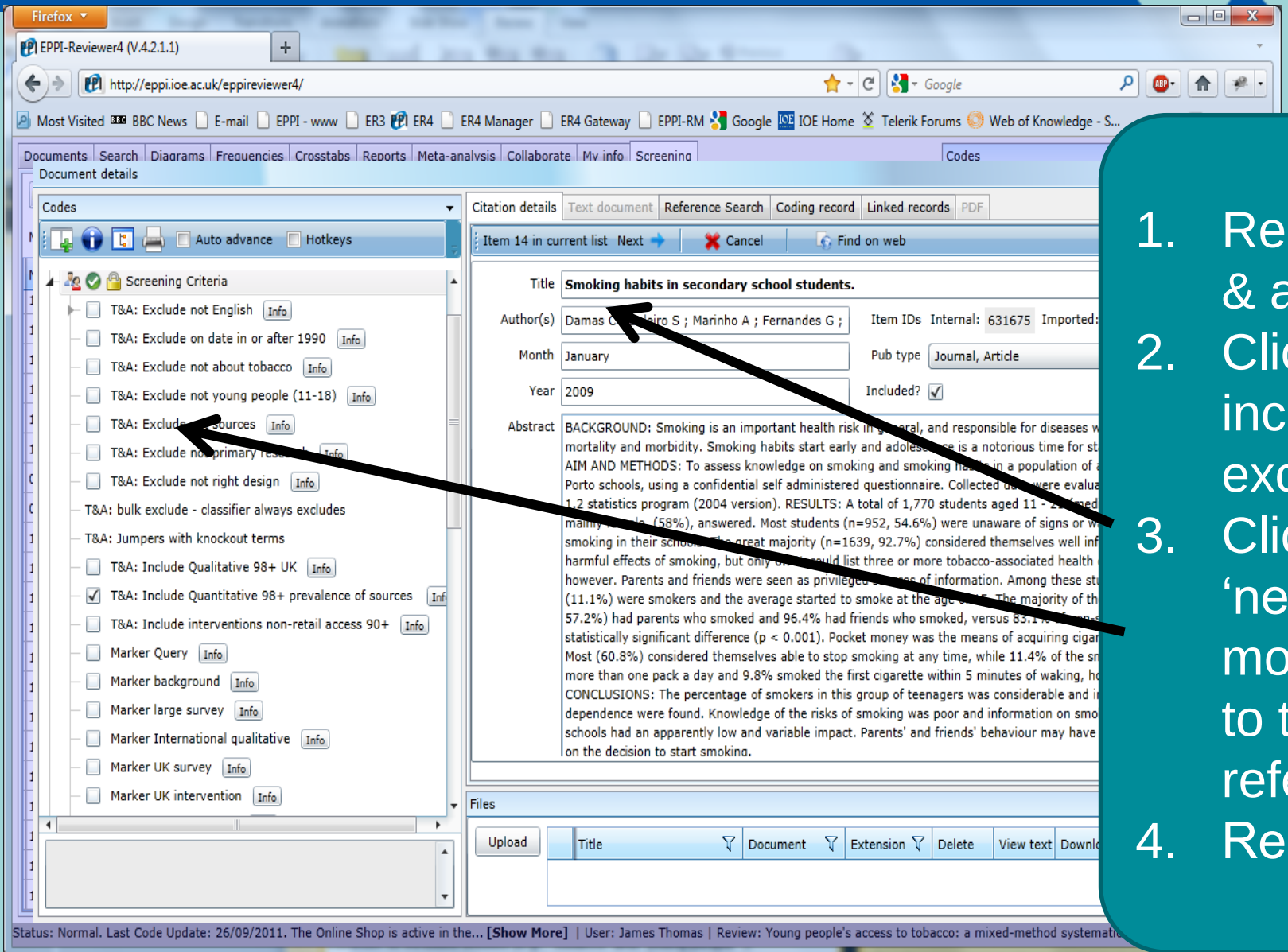
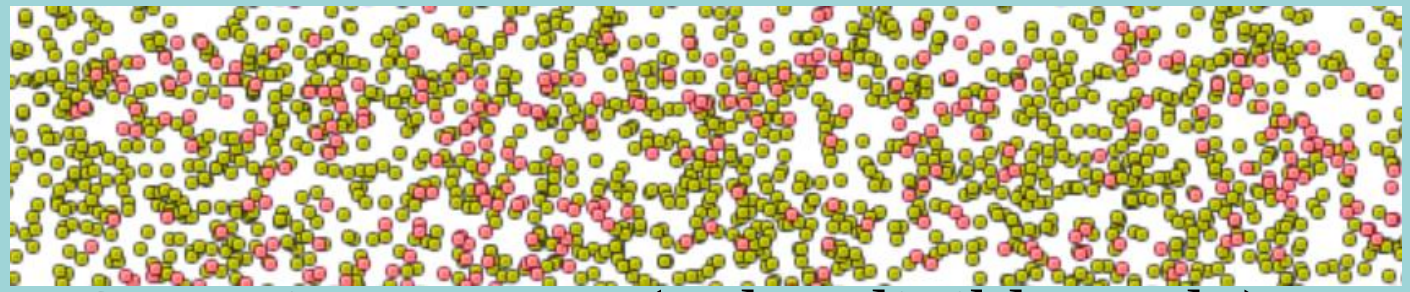
Machine learning / text mining for
reducing workload during citation screening



1. Read title & abstract
2. Click include / exclude
3. Click ‘next’ and move on to the next reference
4. Repeat…

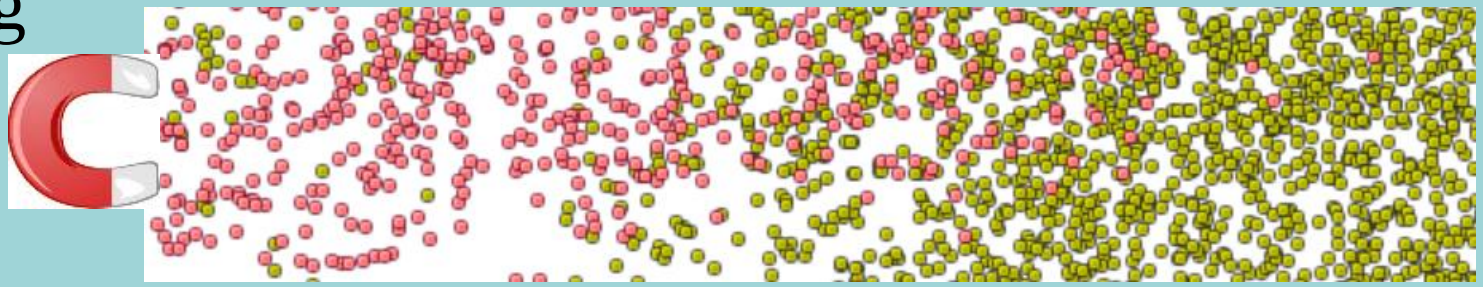
Screening prioritisation: Changing the distribution of studies

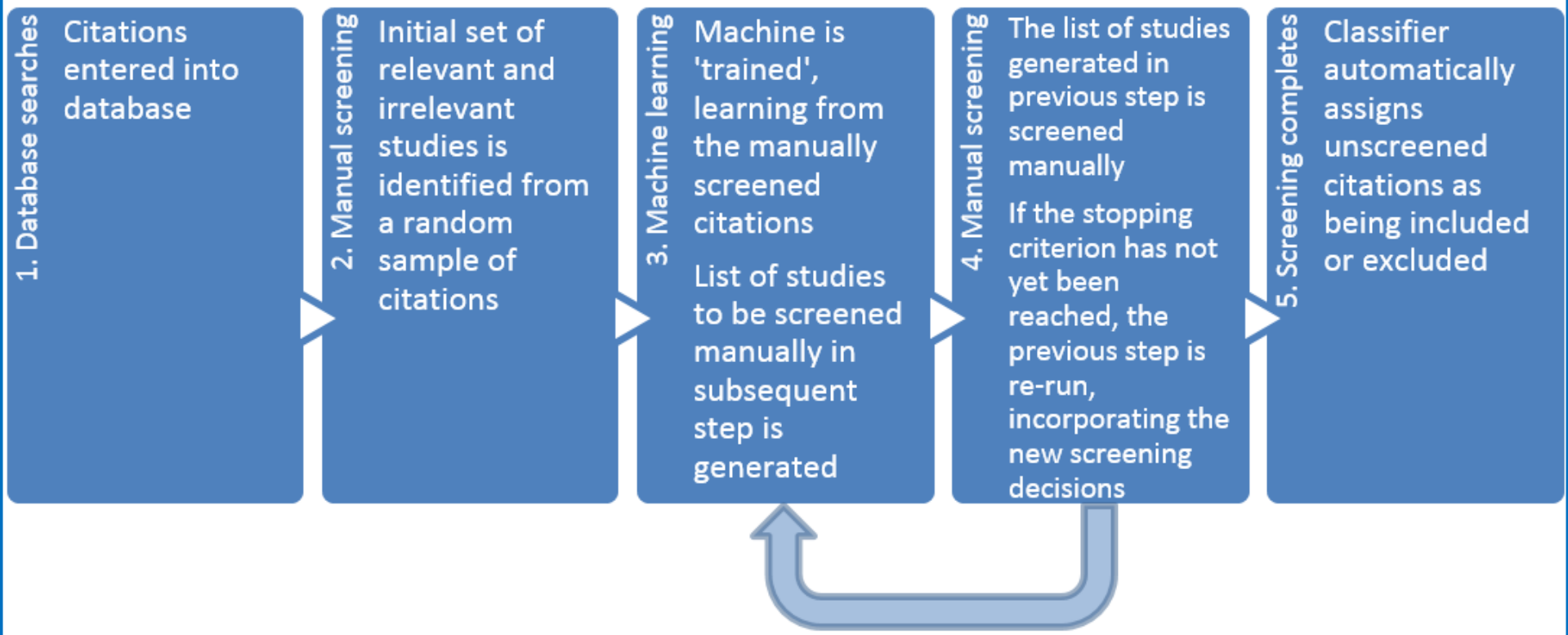
Traditional screening



Screening process (red = eligible study)

Screening aided by text mining




1. Database searches
Citations entered into database
2. Manual screening
Initial set of relevant and irrelevant studies is identified from a random sample of citations
3. Machine learning
Machine is 'trained', learning from the manually screened citations
List of studies to be screened manually in subsequent step is generated
4. Manual screening
The list of studies generated in previous step is screened manually
If the stopping criterion has not yet been reached, the previous step is re-run, incorporating the new screening decisions
5. Screening completes
Classifier automatically assigns unscreened citations as being included or excluded

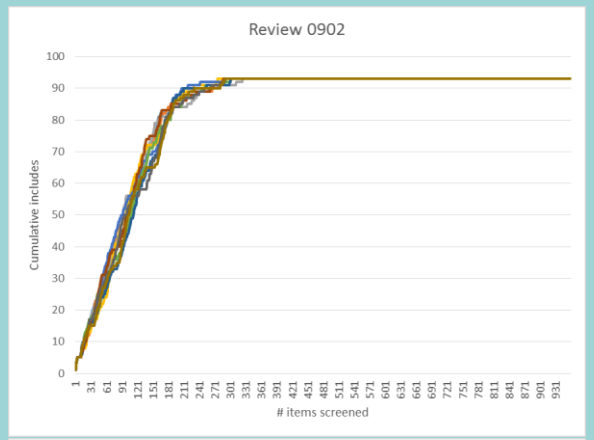
The result

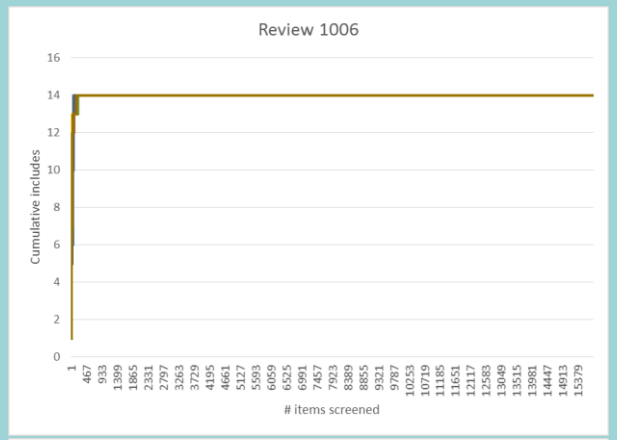
- The result is an ordered list of titles and abstracts
- Those that are *most similar* to the ones already marked as ‘include’ are at the top
- The person screening continues to screen as usual, but behind the scenes the titles and abstracts remaining are re-ordered regularly (e.g. every 25 items)

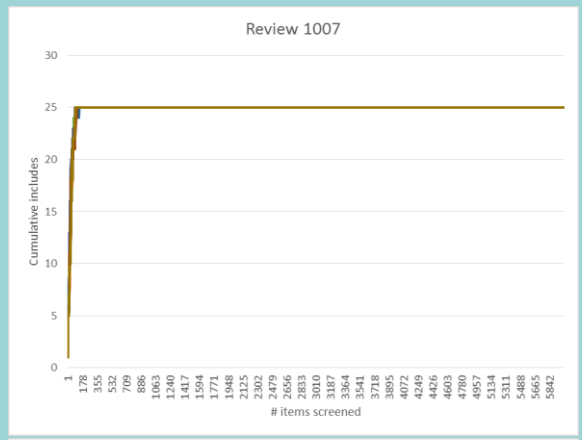
Automatic classification

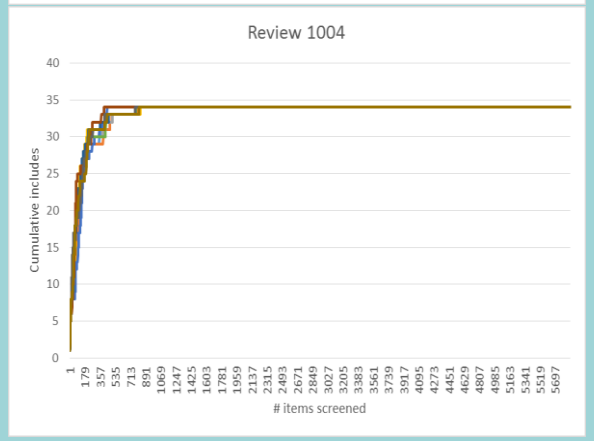
Does it work?

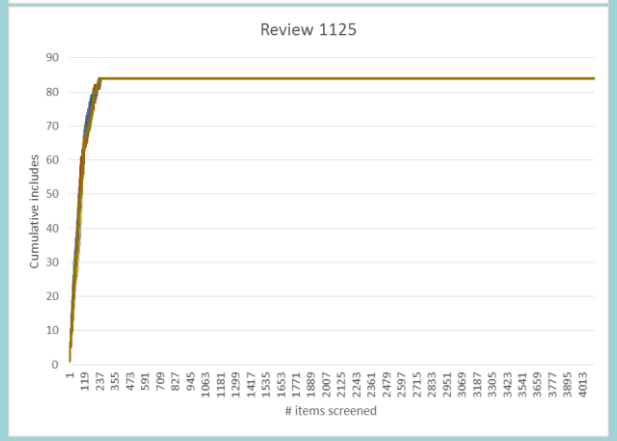
e.g. reviews from Cochrane Heart Group

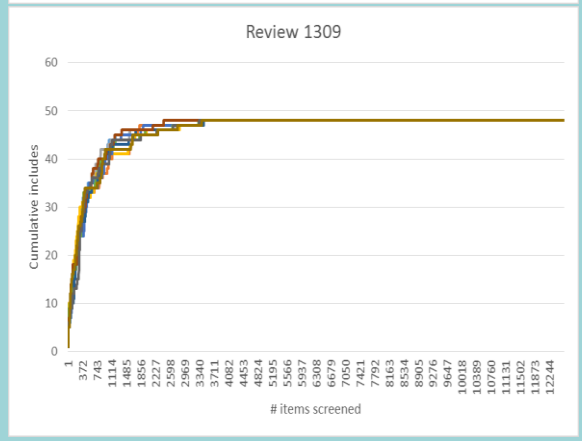












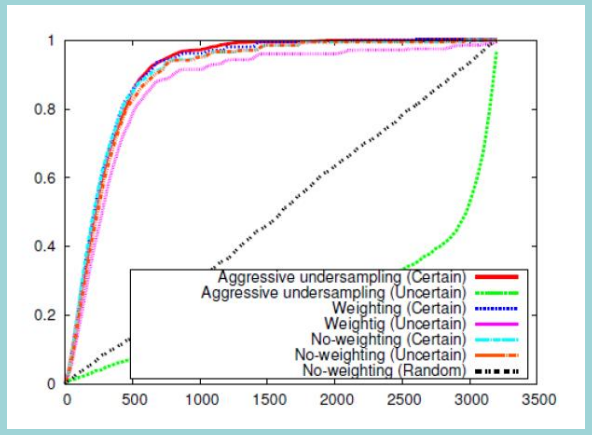
Comparison of clinical vs public health

- Miwa M, Thomas J, O'Mara-Eves A, Ananiadou S (2014) Reducing the screening burden in systematic reviews through active learning on imbalanced data sets. *Journal of Biomedical Informatics*

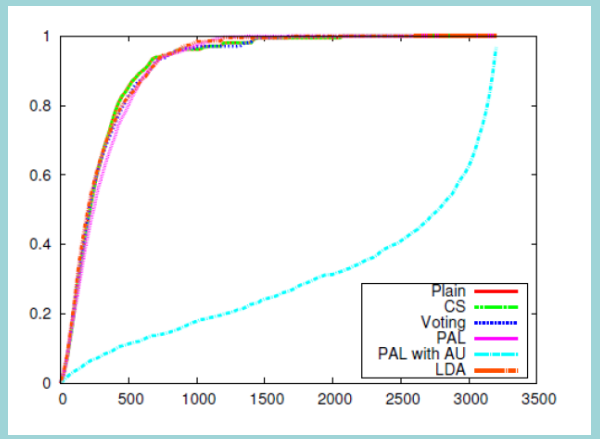
Comparison: two reviews

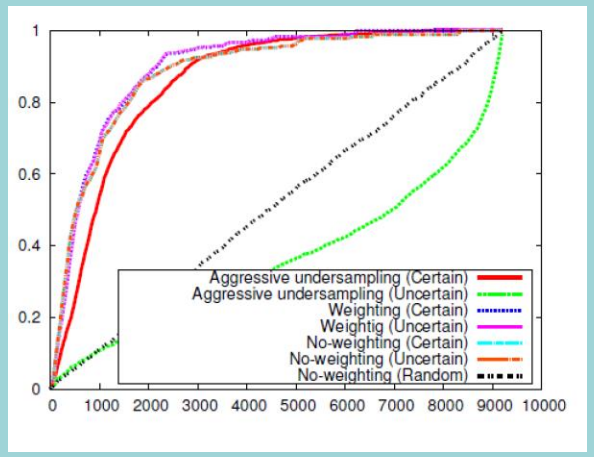
‘Basic’ methods

With enhancements

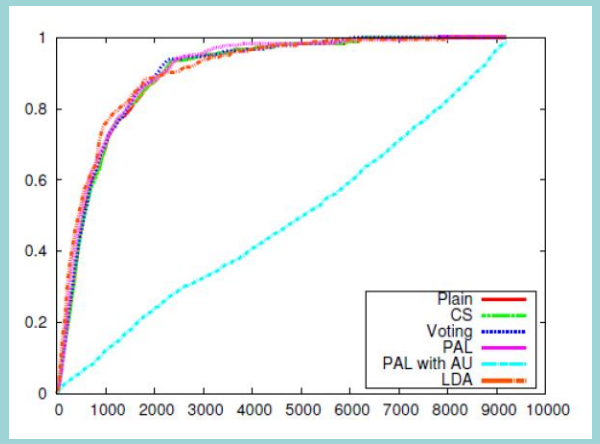


“Micro nutrients”



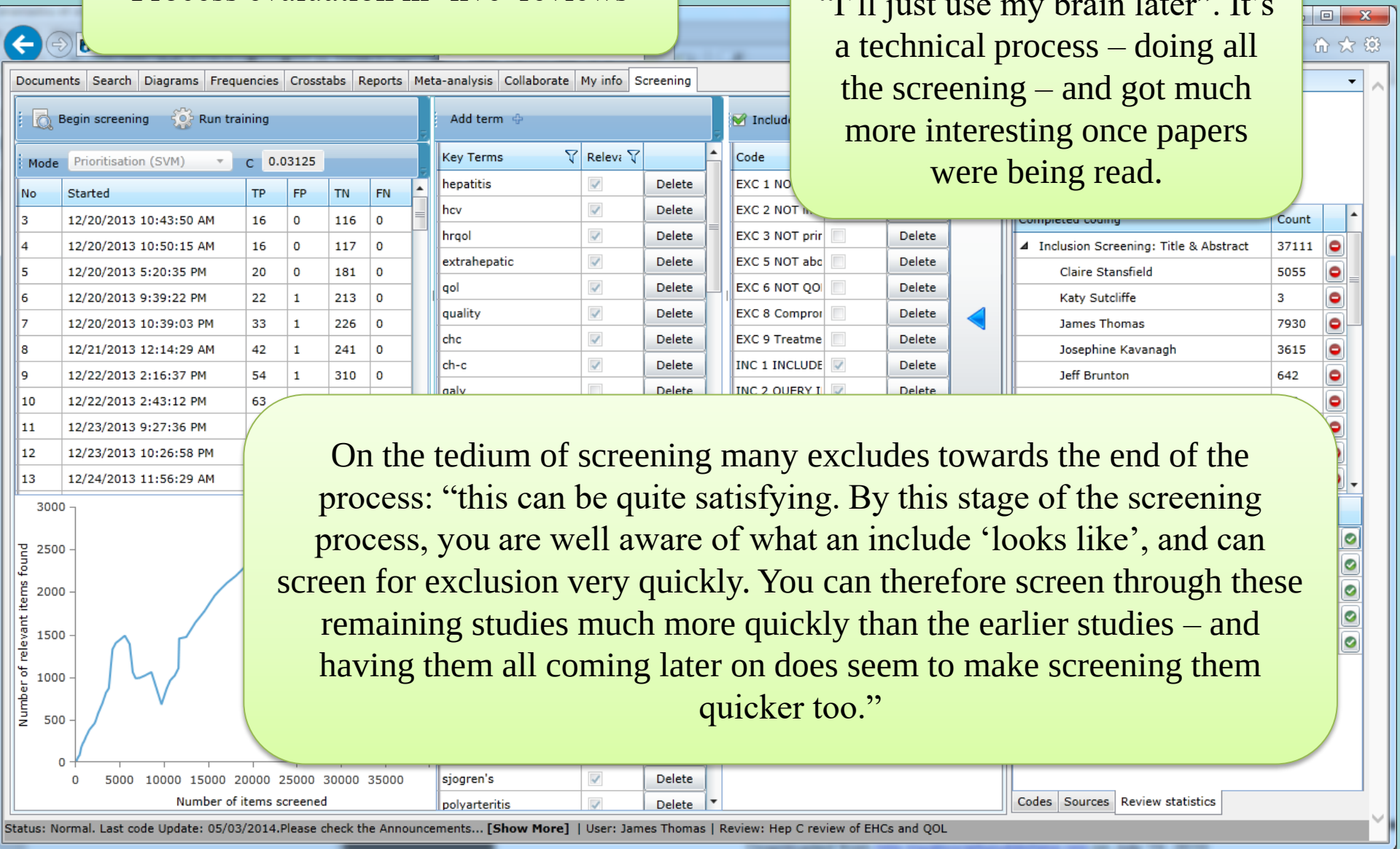


“Cooking skills”



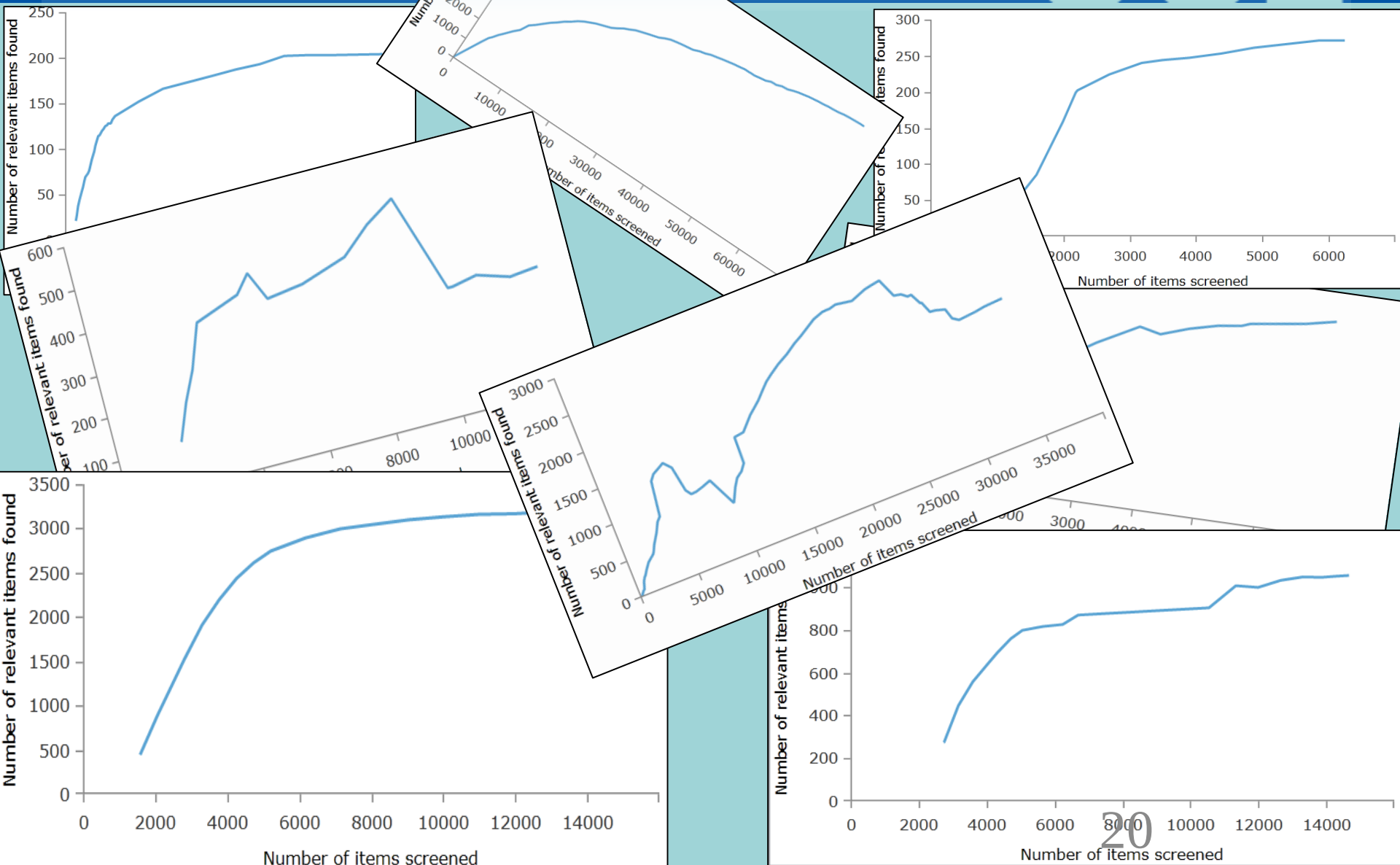
Process evaluation in ‘live’ reviews

“I’ll just use my brain later”. It’s a technical process – doing all the screening – and got much more interesting once papers were being read.



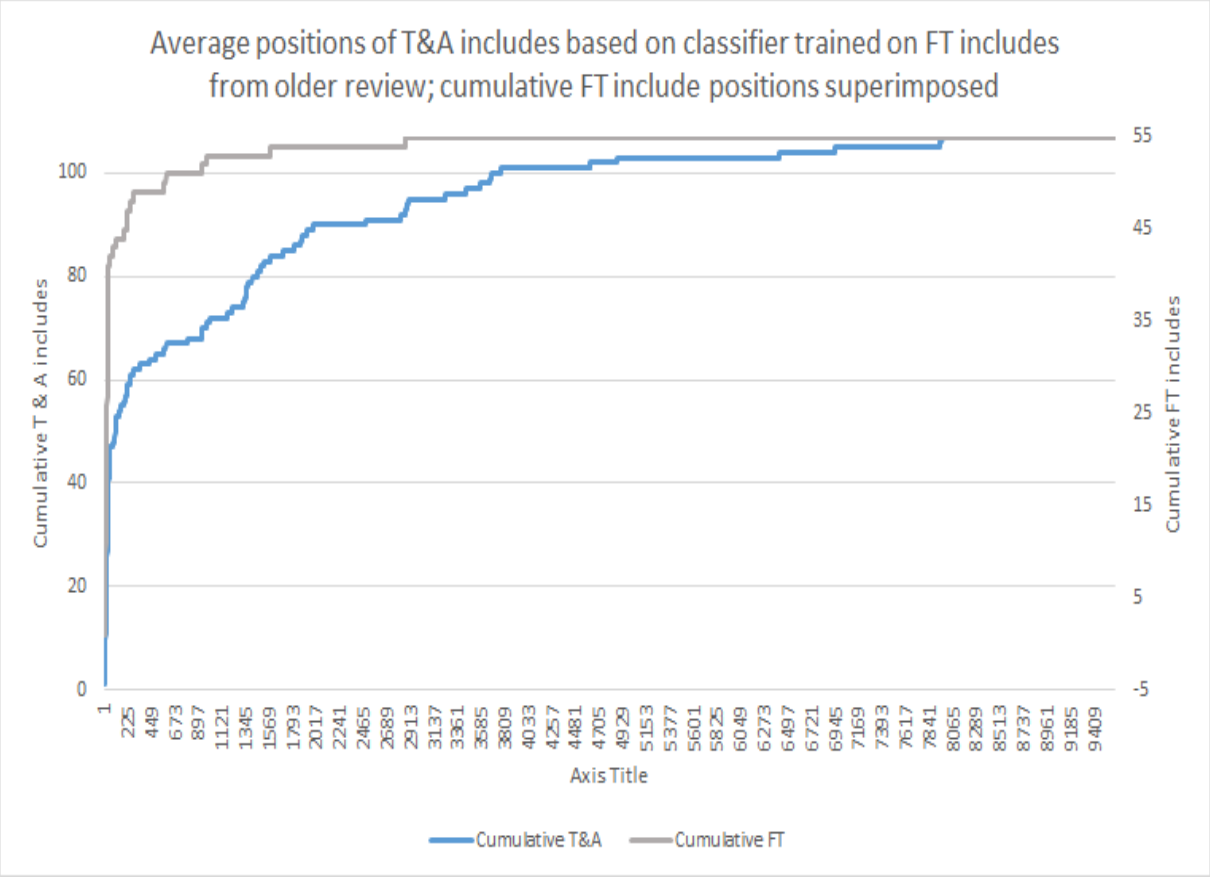
On the tedium of screening many excludes towards the end of the process: “this can be quite satisfying. By this stage of the screening process, you are well aware of what an include ‘looks like’, and can screen for exclusion very quickly. You can therefore screen through these remaining studies much more quickly than the earlier studies – and having them all coming later on does seem to make screening them quicker too.”

Using the technology in live reviews: not all textbook graphs!



… and for updating existing reviews

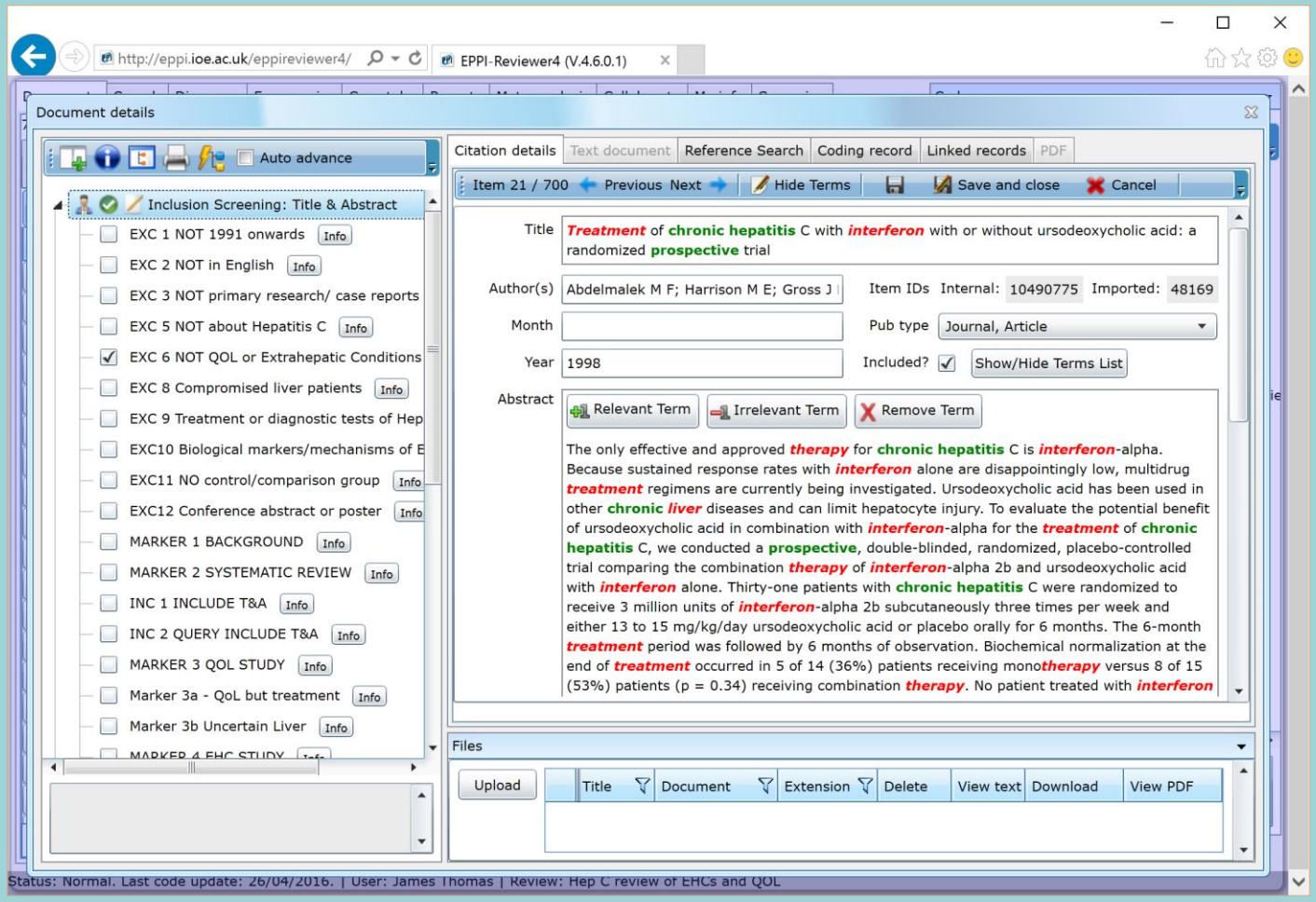
Weightman A, Thomas J, Baker P, Lovie-Toon Y, Francis D, O'Mara-Eves A (2014) Text mining for screening efficiency? Testing within a Cochrane public health review. Poster presented at Cochrane Colloquium 2014, Hyderabad



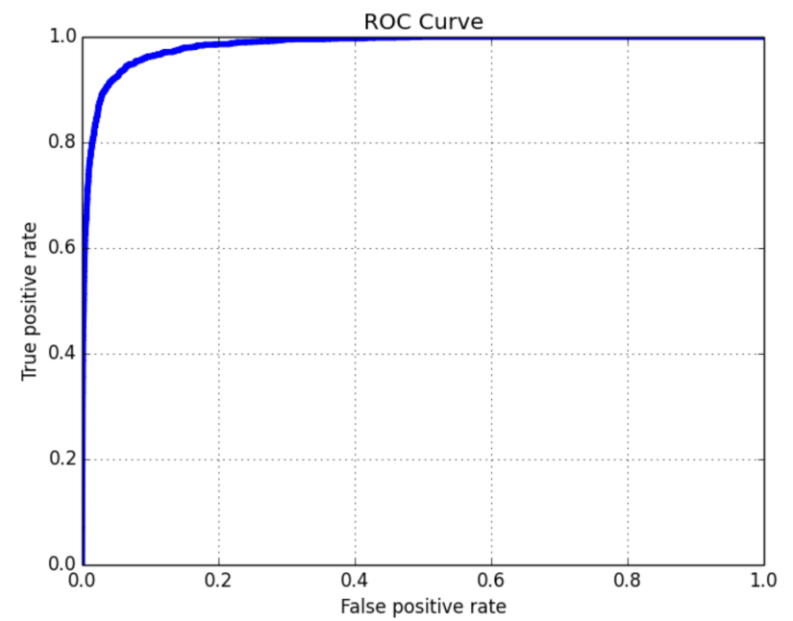
Active learning:

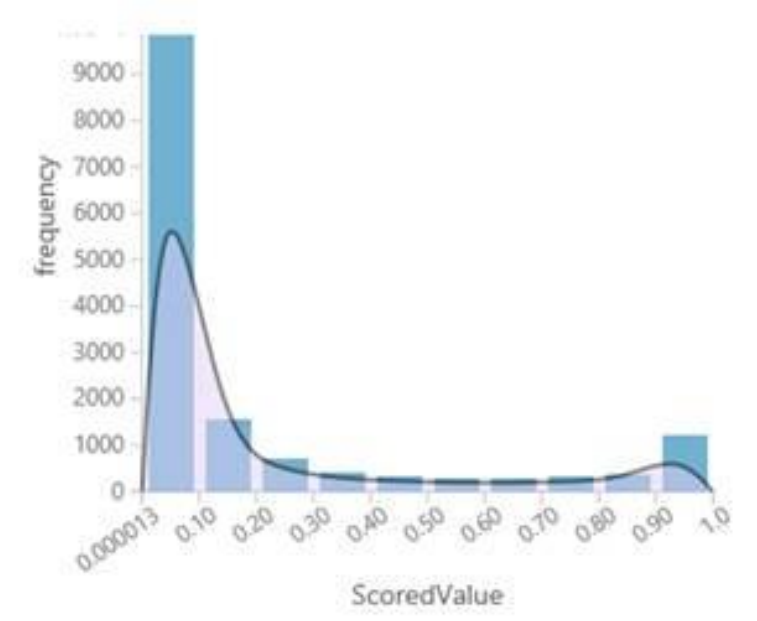
Screening in EPPI-Reviewer

Citation screening in EPPI-Reviewer



Identifying RCTs automatically – coming soon





Acknowledgements

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Quality assessment / data extraction

Meta-analysis

Thank you

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SSRU's EPPI website: http://eppi.ioe.ac.uk

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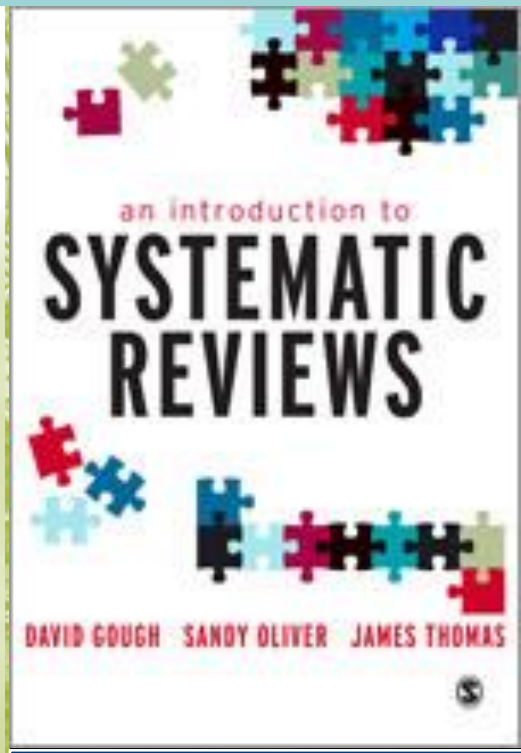
EPPI CENTRE

The EPPI-Centre is part of the Social Science Research Unit at the UCL Institute of Education, University College London



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