EPPI-Reviewer: software for research synthesis[1]

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Background

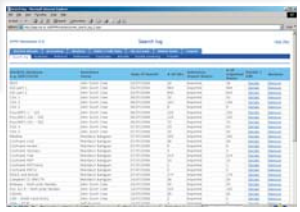
Systematic reviews of social research can entail the storage, classification and analysis of large quantities of electronic data and the management of these data across many reviewers working in different sites. This presents many challenges to the management of the review because, unless effective systems are developed to manage these data, reviews may become 'unsystematic' by losing studies or failing to track which studies originated from which search and the reasons for their inclusion/exclusion. The growth in the internet has made it easier for people to collaborate on projects without necessarily working in the same place. However, few software tools support distributed working throughout the life cycle of the review.

One solution to this problem is presented here. It depicts some of the major information management challenges in reviews and shows how a bespoke software application, EPPI-Reviewer, assists in each stage of the review.

Citations are downloaded from databases (e.g. ERIC)

EPPI-Reviewer can import citations from the major health and social science databases. Filters for new databases are added when required.

They are imported into EPPI-Reviewer and checked for duplicates



A major issue in systematic reviews is keeping track of all citations. A permanent search log helps reviewers to organise their citations and report the results of searches accurately at the end of the review.

References are allocated for screening and then screened by reviewers

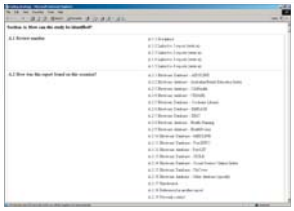
Sometimes, many tens of thousands of references are screened for inclusion in a review. If these references are stored in one place, together with decisions on their inclusion into the review, the chances of losing important references are reduced.

Citations can be screened on titles and abstracts by one or more people. If references are being 'double-screened', kappa statistics are available to measure inter-reviewer reliability.

The full papers of relevant studies are obtained and screened for inclusion

Again, following the principle that nothing should be lost to the review, software can aid the process of retrieving full papers by, for example, keeping track of which papers still need to be retrieved, which are on order and which are available in specified libraries.

Data extraction strategies are developed and agreed



Standardised data extraction strategies are used to describe studies in a structured way. We use 'generic' and 'review specific' data extraction strategies (or protocols). The 'generic' strategies capture general information about a study such as its population, topic area, methodology. 'Review specific' strategies are used to capture specific information which is relevant to a particular review.

Categorical, free-text and numeric data are extracted for use in the later synthesis.

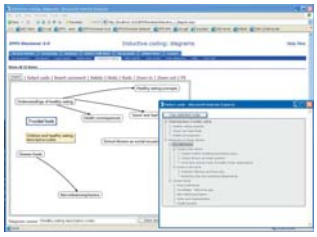
Reviewers can create new strategies on the database for their reviews, or adopt existing ones.

Generic data extraction strategies are important because over time a consistently coded database of studies is created with no additional effort.

Data extraction takes place of studies which meet the review's inclusion criteria

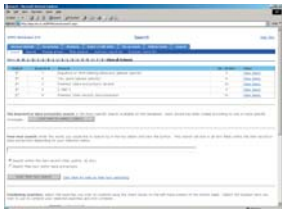
Categorical data can be summarised using simple frequencies and crosstabs...

...as well as being combined with free-text data in tables.

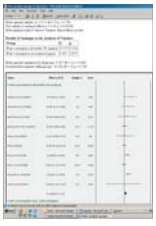


Inductive coding functions allow line by line coding of textual data and organising and structuring these codes graphically into 'conceptual relationships diagrams'.

Sophisticated Boolean searches can be conducted.

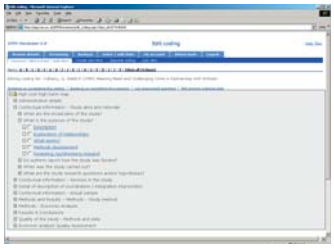


Fixed and random effects meta-analyses can be conducted and forest plots can be produced to summarise the results.



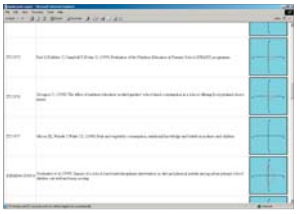
The results of the studies are synthesised

Data extraction is usually undertaken by two researchers who work independently and then meet to discuss their findings. EPPI-Reviewer facilitates this process by enabling reviewers to work concurrently on their individual 'data extractions' and then producing a report detailing potential discrepancies.



If statistical outcome data are being extracted, the software can calculate standardised mean differences from a wide range of published information (such as means and standard deviations, standard errors, confidence intervals, p- and t-values) and odds ratios, risk ratios, risk differences from 2×2 tables.

Spider-web or 'radar' graphs are available for ordinal variables.



The database of studies becomes part of the dissemination process

Because all health promotion reviews at the EPPI-Centre have used the same tool for more than 10 years, we have developed a database of studies with detailed and consistently applied codes which can be made available online as a resource to others working in the field. This shows the benefits of the generic data extraction tool in action.

This poster illustrates the benefits of a system containing consistently coded data across a series of reviews. The studies from more than 90 systematic reviews are stored on the database, the majority classified with one of three classification systems. This supports the identification of studies for future reviews and is a resource which offers users far more information about the research it contains than a database containing only basic bibliographic information.

Current thinking in e-social science suggests that an important area for future work involves the standardised 'tagging' of online information. Systematic reviewers could both contribute to, and benefit from, this activity - something which requires the development of appropriate systems more than it requires any additional work in the actual task of reviewing. With the increased adoption of core meta-tagging frameworks (such as Dublin Core[2] and the Data Documentation Initiative[3], organisations involved in supporting systematic reviews need to consider carefully how to support and promote the adoption of international standards for the classification and identification of research.

REFERENCES

1. Thomas J, Brunton J (2007) EPPI-Reviewer: software for research synthesis. Presented at the NCRM annual meeting, Manchester, 11–12 January.
2. http://dublincore.org/
3. http://www.icpsr.umich.edu/DDI/

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