Cochrane and technological developments

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Trusted evidence.
Informed decisions.
Better health.

The Cochrane Library: as you know it…

- Collection of 7 databases:
  - CDSR (the Cochrane Reviews)
  - CENTRAL (Cochrane Register of Controlled Trials, clinical trials register)
  - Database of Abstracts of Reviews of Effects (DARE)
  - Health Technology Assessment Database (HTA)
  - NHS Economic Evaluations Database (EED)
  - The Cochrane Methodology Register
  - About Cochrane
- But this is changing!

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What does the future hold for the Cochrane Library?...

The Enhanced Cochrane Library…

- All aspects of the Cochrane Library are being redeveloped to enhance users' experience
- CDSR and CENTRAL will be linked together, allowing you to click through from a review to the studies included in the review…
- New search interface
- A Spanish version will be available
- Cochrane Clinical Answers (a "plain language" version of the CDSR) will be incorporated, with 1200 articles linked to Cochrane reviews
- A new federated search filter will incorporate the Epistemonikos database

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Epistemonikos

- Collaborative, multilingual database of health evidence
- Systematic reviews are sourced by regularly screening 11 sources (including PubMed, Embase, LILACS, CINAHL etc)
- Features include links between systematic reviews and their included studies
- Any time you open an article, you get a diagram of related evidence
- You can produce a matrix showing all the systematic reviews answering a question, and all the studies included in those reviews

And it’s goodbye to…

- DARE, HTA, EED are no longer updated and will be removed.
- DARE and EED will be archived on the Centre for Reviews and Dissemination website: https://www.crd.york.ac.uk/CRDWeb/
- The Cochrane methodology reviews rehoused on Cochrane Methods
- About Cochrane content will be available on individual Cochrane group’s websites

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But what about the data?

- Cochrane launched their Linked Data project in 2014…
- Cochrane has rich content and data stores that are currently locked up in silos …
- The aim is to:
  - Link Review content and study content data stores
  - Enrich our content and data with metadata using controlled vocabularies (SNOMED CT, etc.)
  - Become more interoperable with other projects, products, datasets, and systems

The problem with CENTRAL…

- The Cochrane Central Register of Controlled Trials is an attempt to find and catalogue all randomized and controlled clinical trials
- Historically the data in CENTRAL has been problematic!
- Duplicates, incomplete records , incorrect records…
- Underpinning the new version of the Cochrane Library is the Cochrane Register of Studies
- This is only available to Cochrane Information Specialists, but many of it's features will help to improve the data in CENTRAL

Cochrane Register of Studies - Background

- Cochrane information specialists maintain clinical trials registries in their area of research: this is a mandatory core function of a Cochrane review group
- These specialised registers are submitted to Wiley to become part of CENTRAL in the Cochrane Library
- In the early days of Cochrane, these were bibliographic records maintained using a variety of software (EndNote, Procite, RefWorks, Reference Manager etc)
- No consistency of approach
- Software becoming obsolete and no longer supported
- Submissions to CENTRAL done quarterly, using FTP – clunky!

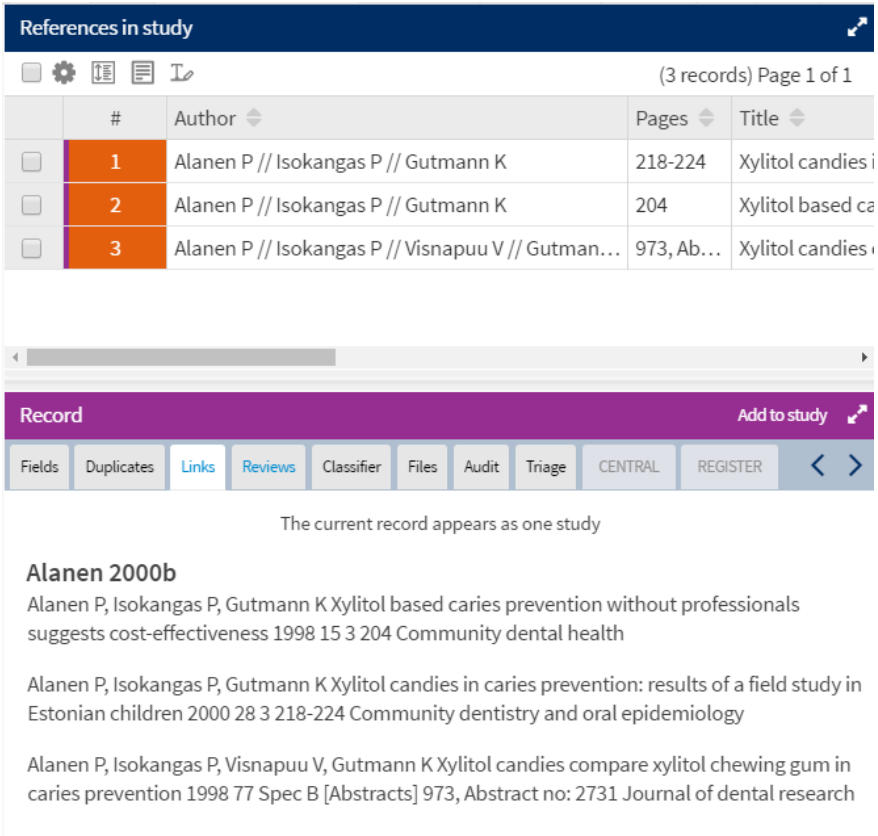
Cochrane Register of Studies: Background

- In the late 2000s, Cochrane went out to tender for a bespoke software solution
- Metaxis won the bid and built the Cochrane Register of Studies, a Java based database, downloaded to the user's desktop and synchronised with a server in Oxford.
- This was rolled out to all Cochrane groups by the end of 2013
- Cochrane products are now going online: browser based
- Next phase of CRS development is CRS Web: we have just completed rollout to all Cochrane groups

Cochrane Register of Studies: Structure

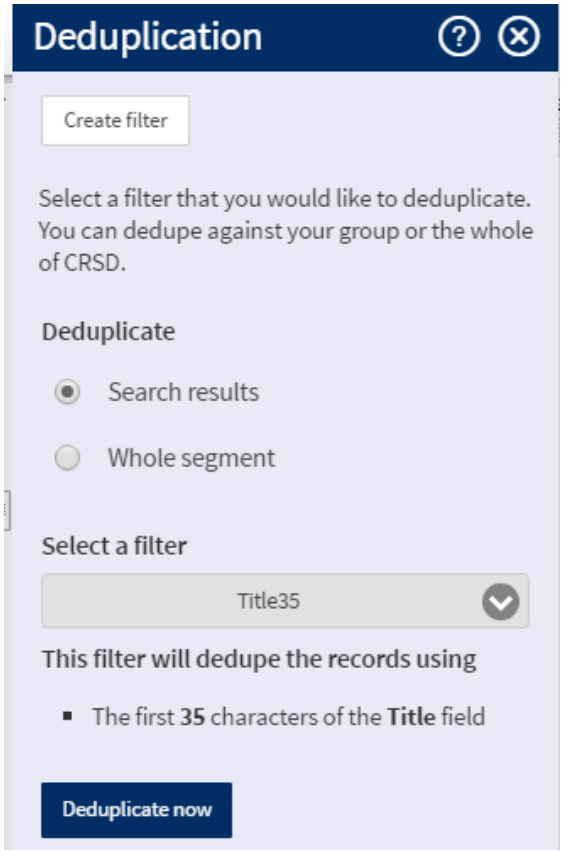
- CRS Web is a front end for CRS D – a data warehouse which holds data related to Cochrane and Cochrane reviews
- Each Cochrane group has a “segment” in the CRS where they can store any records they like (including as attachments, PDFs etc)
- The segment contains the group’s specialised register records, any CENTRAL records which have been submitted to CENTRAL and tagged by the group as within their scope, the reviews produced by the group and any included or excluded studies from those reviews
- CRS allows instant publication in CENTRAL, rather than having to upload records every quarter. At the moment, this is not quite instant as the records are collected by Wiley for publication each month.

Cochrane Register of Studies: Key Features



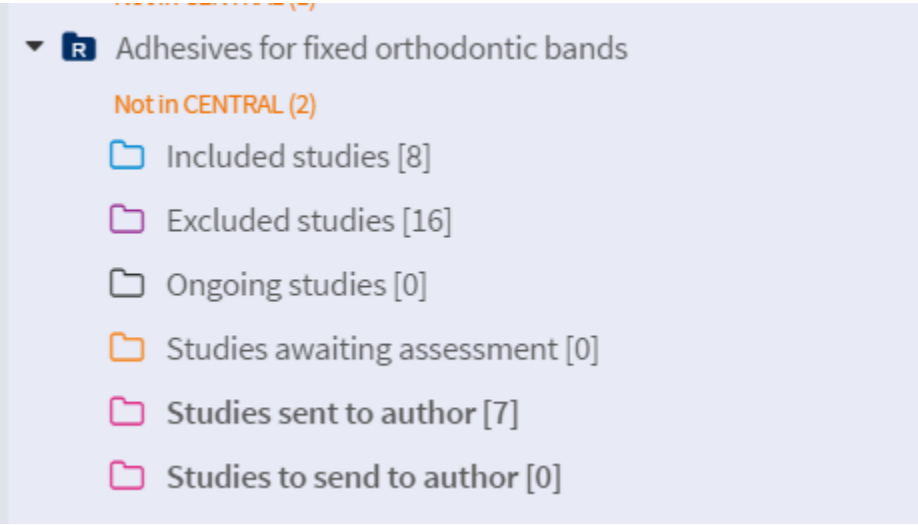
- Allows linking of studies (clinical trials) with their references
- This happens automatically within CRS Web if a study is included in a review

Cochrane Register of Studies: Key Features



- Records are deduplicated on import
- But information specialists can also deduplicate their entire segment or the results of a particular CRS search
- Allows us to merge duplicates together keeping the best of both records
- There are several inbuilt deduplication filters to help us to do this, (example here deduplicates on the first 35 characters of the title)
- Or we can create our own…

Cochrane Register of Studies: Key Features



- Tracking module allows us to see which references are included in a Cochrane review but are not in CENTRAL
- This means we can quickly and easily add references from a review to CENTRAL
- We can also track what has been sent to a Cochrane author for a review, and so we won't send it again when the review search is updated

Cochrane Register of Studies: Key Features

- HarmoniSR project has produced a set of rules for inputting data, which ensure consistency of data in records – some of these rules are applied automatically
- Everything will be together in one place – Cochrane information specialists will not be working in silos…
- This will improve the CENTRAL data over time, which will be surfaced in the Cochrane Library

More improvements to CENTRAL data are coming too…

- CENTRAL is currently populated in three ways:

1. The Cochrane Groups Specialised Registers, compiled by information specialists
2. Any record from PubMed with “randomized controlled trial” or “controlled clinical trial” in the publication type is automatically read into CENTRAL
3. Records from Embase are fed in via Cochrane Crowd

Centralised Search: Cochrane Crowd

- Each month, Embase is searched for clinical trials records using a filter developed by Julie Glanville at YHEC
- These records are then fed through to Cochrane Crowd: a group of 6000+ volunteers who screen the records and determine whether it is a controlled clinical trial, they use a bespoke online portal developed by Metaxis
- Three individuals need to agree for the record to go into CENTRAL
- These records are then published in CENTRAL as part of the Cochrane Library
- We want to roll this model out for other databases…
- If you'd like to have a go yourself, go to:

  crowd.cochrane.org

Centralised Search: Cochrane Crowd

- Currently Embase and Korea Med records have been added and will continue to be fed to the Crowd
- We're looking at rolling out to other databases (LILACS is an obvious candidate – free content!)
- We'd also like to do this for CINAHL but there are issues with copyright and licencing…
- WHO ICTRP is another database that we are trying to get through the Crowd, but have hit problems with the search…
- Ongoing!!

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The Future: PICO Annotator

- Key to Cochrane's Linked Data project is the PICO Annotator, adding metadata to Cochrane reviews (ie the population, the intervention, the comparator and outcomes)
- This should allow better searching and browsing of Cochrane evidence
- Controlled vocabulary from several sources is being used to create the metadata (SnowMed, MEDra, Rxnorm)
- Search / browse interface is being developed at the moment
- The aim is to annotate full PICOs from every review at three levels:
  - Review (there are over 6,800 of these)
  - Every included study (there are almost 90,000)
  - Every analysis (that's 133,000 outcomes)

The PICO Annotator

- The project was successful in gaining some funding from the Gates Foundation
- Because of this, the initial focus has been on child health
  - Reviews from Pregnancy and Childbirth Group, Neonatal Group, Child Health Field
- From this experience, guidance and tools have been developed for rolling out the project across Cochrane groups
- The PICO elements will eventually become the responsibility of information specialists – a data curation role
- Intent is to use machine learning for some of the annotating…
- To find out more – visit http://linkeddata.cochrane.org/picofinder for a demo video!

The Classifier

- The Classifier is a tool within CRS Web, which has introduced machine learning into Cochrane for the first time, developed by James Thomas from EPPI
- It's expected that the Classifier will link all the developments we have talked about so far today
  - It can be applied to records within a group's CRS segment to identify other records within the CRS which might be of interest
  - It can suggest records coming through from Cochrane Crowd that might be of interest to Cochrane information specialists
  - It will be used to pull out the basic PICO elements within a study for annotation
- It is the main component of the "Evidence Pipeline": a project to address the difficulty of finding reports of studies for inclusion in a review in a timely and reliable way

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The Classifier: machine learning in action…

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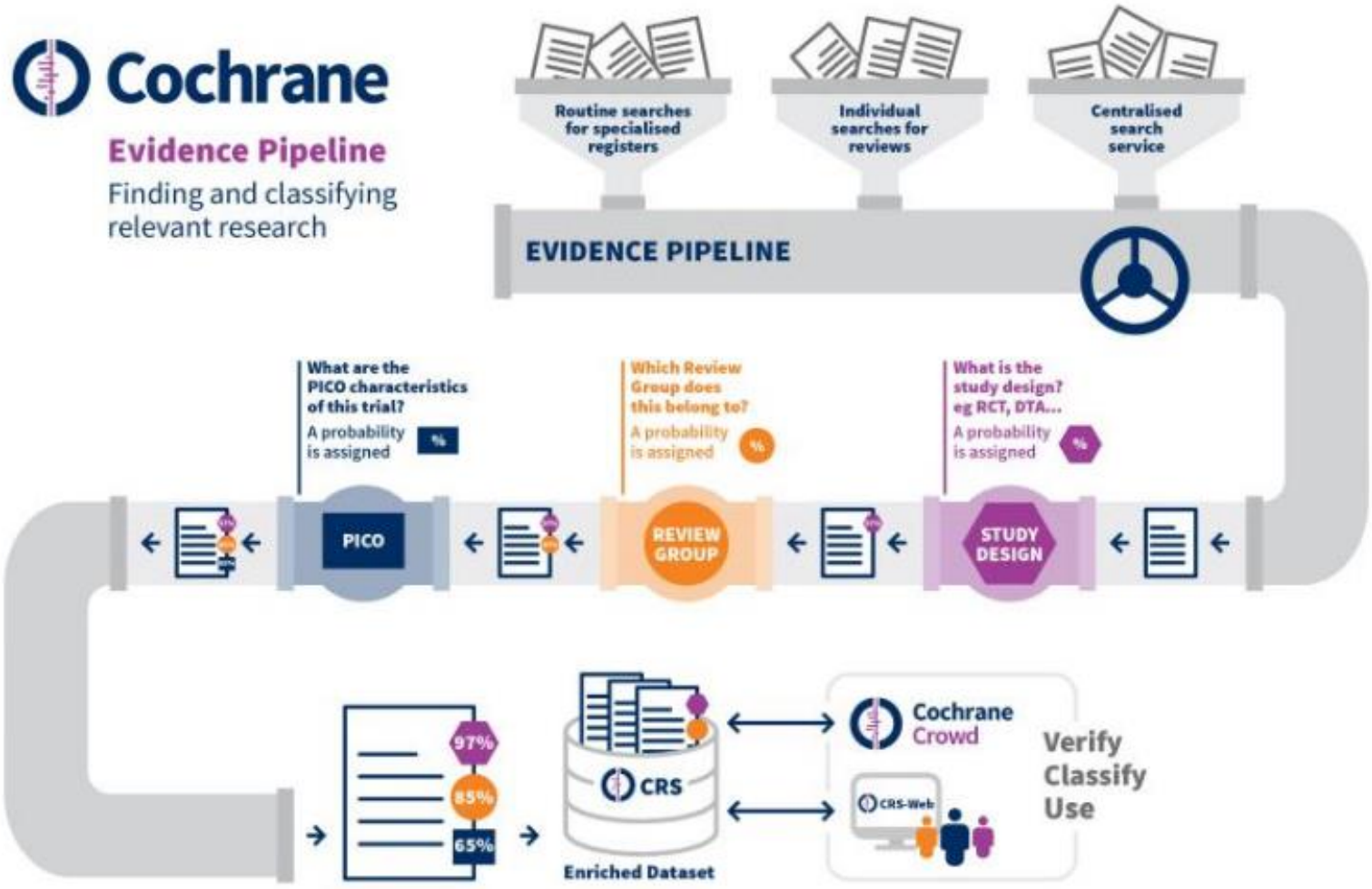

When will I see this in the Cochrane Library?

- Some of this is already there (records via Cochrane Crowd)
- Hopeful that enhanced Cochrane Library will be rolled out 2017/2018
- Demonstrations of enhanced Cochrane Library will take place at the Global Evidence Summit in Cape Town next week
- The Classifier is already available to Cochrane Information Specialists to help them with trial identification
- All groups are now live on CRS Web
- The PICO Annotator project is underway – a search interface is in development and Cochane information specialists have started annotating the reviews…

Any questions?

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