

## Systematic Reviews and the Cochrane Collaboration

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## Outline

- Short outline of the development of systematic review/Cochrane Library
- Doing a systematic review with the Cochrane Collaboration: pros and cons
- Current methodological challenges

## Archie Cochrane



“It is surely a great criticism of our profession that we have not organised a critical summary, by specialty or sub-specialty, adapted periodically, of all relevant randomized controlled trials”

## Archie's challenge

- Specialties ranked according to attention paid to evidence
- Tuberculosis chest physicians came first
- Obstetricians and gynaecologists came last
- Effective Care in Pregnancy and Childbirth
  - Chalmers, Enkin and Kierse (eds) 1989

## First Cochrane Centre was established in the UK in 1992

- To collaborate with others to produce systematic reviews of effectiveness of health care interventions
- Funded by the UK NHS Research and Development Programme

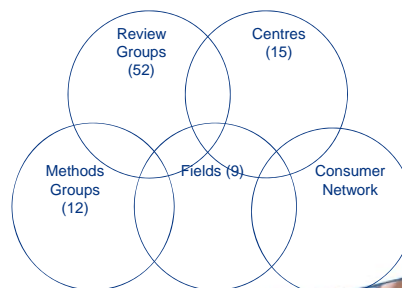
## The Cochrane Collaboration

- International organisation
- Founded in October 1993
- Australasian Cochrane Centre founded in 1994

*The Cochrane Collaboration is an international organisation that aims to help people make well-informed decisions about health care by preparing, maintaining, and promoting the accessibility of systematic reviews of the effects of health care interventions.*



## Cochrane Collaboration



## The Cochrane Library published by Wiley

- The Cochrane Database of Systematic Reviews (CDSR)
- Database of Abstracts of Reviews of Effectiveness (DARE)
- The Cochrane Controlled Trials Register (CCTR)
- The Methods Studies Database
- Health Technology Assessment Database
- Economic Evaluations Database



## Process of doing a Cochrane review

- Register title with relevant review group
- Write protocol = background, objectives and methods (≈ 2-3 months)
- Peer review = 3 content experts and 1 statistician
- Do review = data extraction, analysis, discussion, implications for practice and implications for research (≈ 2-3 months)
- Peer review



## How the Cochrane Collaboration can help with your review

- Training – face to face by Cochrane Centres, on-line
- Manual for systematic reviews of interventions (and soon for reviews of diagnostic test accuracy)
- Revman – software for writing Cochrane reviews and doing meta-analysis
- Other software is available and can be used eg STATA



## Methods Working Groups

- Statistical Methods
- Screening & Diagnostic Tests
- Prognostic Studies
- Individual Patient Data Meta-Analyses
- Health Economics
- Coding & Classification methods (Indexing)
- Empirical Methodological Studies Methods
- Informatics
- Applicability & Recommendations
- Placebo Methods
- Non-randomised Studies
- Quality of Life Methods



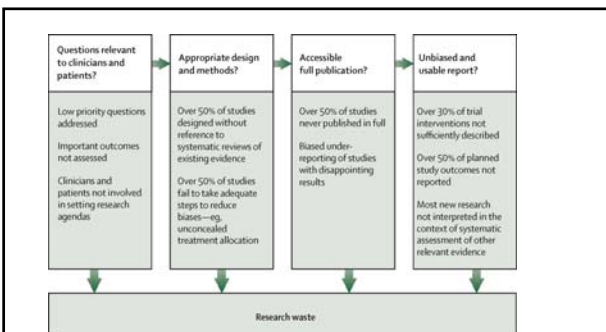
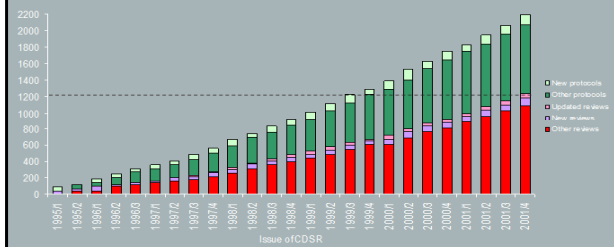
## Development of methods

- The Cochrane Collaboration is keen to support the ongoing development of methods for systematic reviews
  - Working groups
  - Methods database
  - Methods reviews
  - Consort, Stard, Quadas
  - Revman, Stata
  - Thomas C Chalmers prize



## Organising I: systematic reviews - 10% done in therapy

Reviews and protocols for reviews on  
The Cochrane Database of Systematic Reviews



Chalmers and Glasziou, Lancet, July 4 2010



## Jørgensen A, Hilden J, Gøtzsche PC, BMJ, Oct 14 2006

- Industry supported reviews of drugs are less transparent than Cochrane reviews and have few reservations about methodological limitations of the included trials; their conclusions should be read with caution. We believe that details of concealment of allocation, blinding, inclusion and exclusion criteria for trials, search strategies, and estimated effects in each included trial need to be reported to allow readers to judge the reliability of reviews.



## Jadad et al, JAMA July 15 1998 Methodology and reports of systematic reviews and meta-analyses: a comparison of Cochrane reviews with articles published in paper-based journals

- Cochrane reviews appear to have greater methodological rigor and are more frequently updated than systematic reviews or meta-analyses published in paper-based journals



## Methodological Issues

- Systematic reviews are not immune to bias
  - data selection, publication bias, language bias
- Exploration of heterogeneity
- Inappropriate aggregation of data
- Inappropriate interpretation of results



## Limitations of Cochrane

- only covers therapeutic interventions
- diagnostic tests and prognostic factors not included (happening very slowly)
- limitations of RCT data
- important outcomes not evaluated
- poor quality of existing trials
- Review process can be slow
- Some constraints in methods



## More methods

- [16.1 Missing data](#)
- [16.2 Intention-to-treat issues](#)
- [16.3 Cluster-randomized trials](#)
- [16.4 Cross-over trials](#)
- [16.5 Studies with more than two intervention groups](#)
- [16.6 Indirect comparisons and multiple-treatments meta-analysis](#)
- [16.7 Multiplicity and the play of chance](#)
- [16.8 Bayesian and hierarchical approaches to meta-analysis](#)
- [16.9 Rare events \(including zero frequencies\)](#)
- [16.10 Chapter information](#)
- [16.11 References](#)



## Systematic reviews and research

- Increasing recognition that systematic reviews are research
- Systematic reviews are now the most commonly cited form of study design. (Patsopoulos NA et al, JAMA 2005, 2362).
- The Lancet announced that, from August 2005, it will require authors submitting manuscripts reporting clinical trials to include a clear summary of previous research findings, ideally by direct reference to a systematic review



## Why hasn't specialisation led to the balkanisation of science?

- Gavin Schmidt
- The third and most important group of high-profile papers are synthesis results--studies that boil down the essentials of what has been learned from many individual studies and put them together. (Unsurprisingly the best ambassadors also tend to be good synthesizers.)



## In conclusion

- Process can be clunky but has resulted in a large number of reviews in a short amount of time
- Lots of technical and methodological support and collective expertise in the area
- Reduction in methodological flexibility can be overcome, and assures greater reliability of methodology



Thank you

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