Methods in Cochrane Reviews: a chose-and-pick model versus a structured model

Cochrane Methods Symposium

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Vienna, 02nd October 2015

Trusted evidence.
Informed decisions.
Better health.

When do difficult situations arise?

Methods to debate

Use of emerging methods

New developments or improvements in existing approaches are needed in some areas and apply to some CRGs (e.g. meta-analysis for sparse data)

Use of existing methods

Not all are suitable for CRs or reviews at all! Debate which one is more appropriate

Is MECIR enough to address these issues?

64	Mandatory	Assessing statistical heterogeneity	Assess the presence and extent of between-study variation when undertaking a meta-analysis.	The presence of heterogeneity affects the extent to w can be formed. It is important to identify heterogeneity information to explain it and offer new insights. Autho is much uncertainty in measures such as I-squared an few studies. Thus, use of simple thresholds to diagno avoided.
		Incomplete methodological guidance		
65	Highly desirable	Addressing missing outcome data	Consider the implications of missing outcome data from individual participants (due to losses to follow up or exclusions from analysis).	Incomplete outcome data can introduce bias. In most follow the principles of intention to treat analyses as f appropriate for adverse effects or if trying to demonst due to incomplete outcome data is addressed in the C However, statistical analyses and careful interpretatio ways in which the issue can be addressed by review can be considered (accompanied by, or in the form of
		Under-developped methodology		

MECIR tells you *what* you are expected to do but now *how* you should do it!
Handbook balances between being understandable and technically sound and cannot cover all detail.
Plus, recommendations in the Handbook are not binding!

What to do when disagreements arise?

Framework

Anarchy

Driving engine for innovation

Encourages people's creativity

Gives a feeling of autonomy to CRGs

CGRs know best what's appropriate for their reviews

When do difficult situations arise?

Flexibility in CRGs

Anarchy

Tyranny – Aristocracy

Guarantees minimum methodological standards for all reviews

Safeguards against a pick-and-chose approach

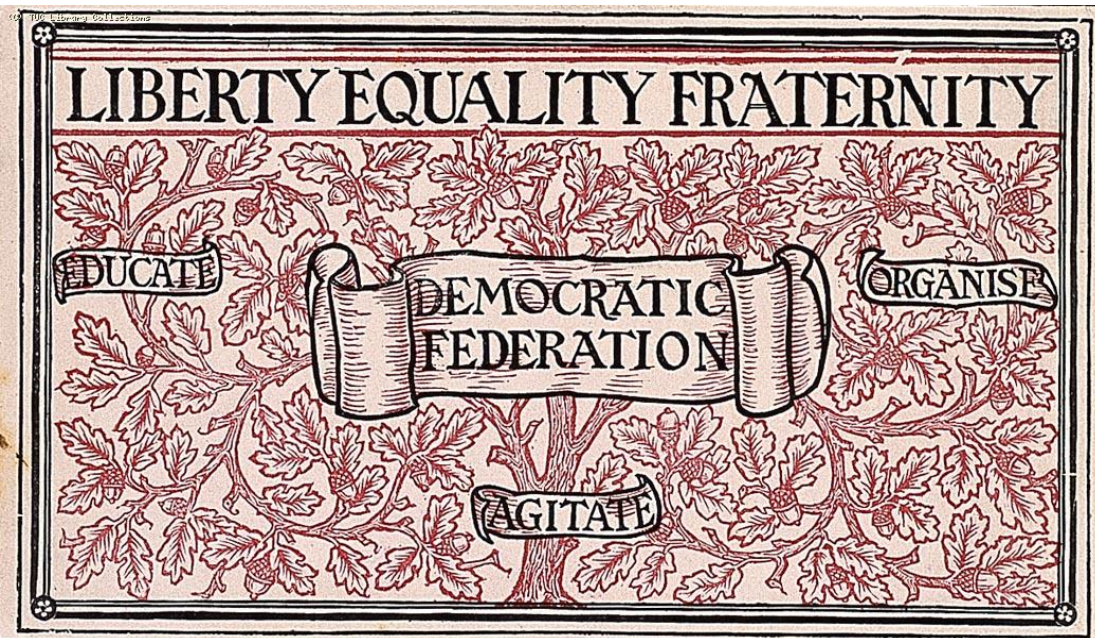Makes the best use of resources – many Cochrane methodologists

When do difficult situations arise?
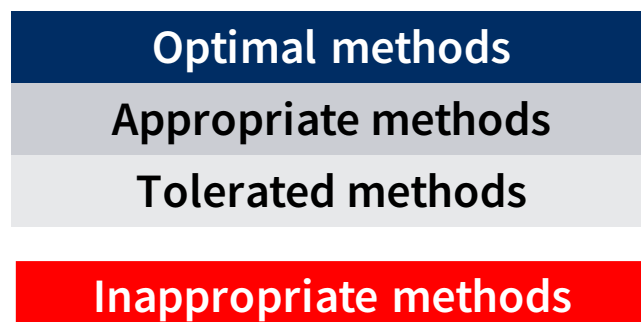
Flexibility in CRGs

Anarchy

Democratic federation

Tyranny - Aristocracy

Cochrane

Try to find a sensible business model

....Where methods in Cochrane Reviews can be picked from a pool of

Optimal methods
Appropriate methods
Tolerated methods

Inappropriate methods

List to be established by Methods Groups in collaboration with CRGs
A communication model is needed to feedback between Review Groups and the Methods Groups (e.g. prompting the Methods Groups when a new method is published, or flagging out methodological gaps –link with MIF)

Example: Challenges in SMG
Estimators of heterogeneity and alternative RE models

Discussion in SMG mailing list (couple year ago!) attracted our attention There are different estimates of heterogeneity and alternative random effects models

Concerns about Cochrane Reviews using out-of-date methods to synthesize data and draw conclusions!

Annals of Internal Medicine | RESEARCH AND REPORTING METHODS

Random-Effects Meta-analysis of Inconsistent Effects: A Time for Change

John E. Cornell, PhD; Cynthia D. Mulrow, MD, MSc; Russell Localio, PhD; Catharine B. Stack, PhD, MS; Anne R. Meibohm, PhD; Eliseo Guallar, MD, DrPH; and Steven N. Goodman, MD, PhD

A primary goal of meta-analysis is to improve the estimation of treatment effects by pooling results of similar studies. This article explains how the most widely used method for pooling heterogeneous studies—the DerSimonian–Laird (DL) estimator—can produce biased estimates with falsely high precision. A classic example is presented to show that use of the DL estimator can lead to erroneous conclusions. Particular problems with the DL estimator are discussed, and several alternative methods for summarizing heterogeneous evidence are presented. The authors support replac-

ing universal use of the DL estimator with analyses based on a critical synthesis that recognizes the uncertainty in the evidence, focuses on describing and explaining the probable sources of variation in the evidence, and uses random-effects estimates that provide more accurate confidence limits than the DL estimator.

Example: Challenges in SMG
Estimators of heterogeneity

An «Heterogeneity and Random Effects Task Force» was created – with experts from the field (included non-Cochrane researchers)

We reviewed the literature, examined simulation/empirical studies and compiled expert opinion

Reached consensus and summarized it in a paper

We have recommendations

With our own resources

This was an exceptional case

Methods to estimate the between-study variance and its uncertainty in meta-analysis

Areti Angeliki Veroniki,[a*] Dan Jackson,[b]
Wolfgang Viechtbauer,[c] Ralf Bender,[d] Jack Bowden,[e]
Guido Knapp,[f] Oliver Kuss,[g] Julian PT Higgins,[h,i]
Dean Langan[i] and Georgia Salanti[j]

Example: Challenges in Methods Groups

CRGs Reviewers

Methods Groups

Handbook

Revman

A Democratic Federation needs:

Discuss with CRGs

Each Methods Group needs to

Review the literature

Assess the available methods for suitability for CRs

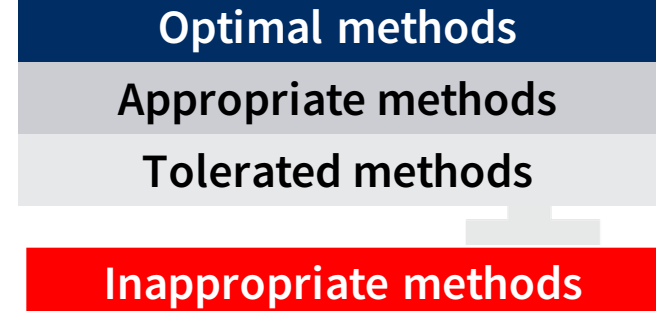Come up with the list of optimal, appropriate and tolerated methods – and 'no-no' methods!

Inform MIF for important research gaps

Devise an interim policy for methodological gaps

Update the list of methods regularly

Optimal methods

Appropriate methods

Tolerated methods

Inappropriate methods

You can't do this with volunteers!

SMG has now a part-time methodologist!

Cochrane

We need to do this now

Because prevention is
always preferable to cure