Primary Health Care Meeting July 2012 – Systematic Reviews

The primary health care study group hosted a half day meeting in July. The meeting consisted of three talks with the general theme of systematic reviews.

The afternoon began with a talk given by Martin Burton from the UK Cochrane Centre titled *"Helping patients understand Cochrane reviews: why and how?"*

Martin started by recommending two books i.) "Better Doctors, Better Patients, Better Decisions: Envisioning Health Care 2020", which was reviewed by Tom King on the significance website (http://www.significancemagazine.org/details/review/1440959/Better-Doctors-Better-Patients-Better-Decisions-Envisioning-Health-Care-2020-edi.html) and ii.) "Know your chances" by Steven Woloshin et al. Martin then continued to talk about statistical literacy in doctors, showing data that indicated that doctors' statistical literacy was not vastly better than the general public's. Martin then moved on to describe current efforts made to present/on-going work on presenting data in ways patients can understand, citing Professor David Spiegelhalter's pictorial risk communication work. Martin then went on to show how this has been/can be applied to Cochrane reviews – pictographically representing different outcomes, showing differences and provided shaded pictographs to represent uncertainty / confidence intervals. Martin then continued to ask how to best educate patients and doctors, suggesting the use of free online courses (for example, by the US Cochrane Centre). Plain language summaries were then discussed, with Martin recommending that they should be stand-alone documents which can be understood by both patients and physicians. The talk concluded with an outline of requirements of a plain language summary, with a specific suggestion that specific advice could be given on how to present numerical information in these summaries (if at all).

The second talk was titled *"Why don't researchers and clinicians use systematic reviews?"* and given by Matt Thompson of Oxford University.

Matt started off by providing some motivation, presenting data that indicated that results from trials are infrequently put into context of systematic reviews, systematic reviews are used (or referred to) in trial development and systematic reviews are used when calculating sample sizes. Matt then continued to present data on why systematic reviews are not used – citing reasons such as there not being one, being unaware of the existence of one, not being able to critically appraise them, not being one that highlights gaps in research and just ignoring them. The PRISMA statement was then discussed, with suggested revisions to improve on vague highlights and to explicitly inform when no more research is needed on a particular subject. Matt then moved on to focus on some recent publications, one investigating the use of systematic reviews when designing studies, one looking at the value of information from systematic reviews, one on of the use of systematic reviews for power and sample size calculations and finally one suggesting a framework for using existing systematic reviews. For the final paper, Matt went on to highlight the basic steps of the framework – making

use of PICOTS (population, intervention, control, outcomes, timing and setting) and identifying relevant, valid and current systematic review/s in your area of interest.

The final talk of the afternoon was titled *"Software and model selection challenges in meta-analysis"* and given by Evan Kontopantelis of Manchester University.

Evan began his talk by offering a definition of heterogeneity in meta-analysis. He then went on to describe the common use of fixed and random effects models, indicating that the methods are asymptotic and highlighting that commonly used random effects models do not account for uncertainty in estimates. Evan then moved on to mention some challenges in meta-analysis: the difficulty in organising data, the fact that parametric models are not always right and also the fact that obtaining an $I^2 = 0$ is not always good news where heterogeneity is concerned. Evan then continued to introduce an Excel add-in for meta-analysis. The add-in's features were highlighted, including a unique feature allowing for multiple outcomes on the same forest plot. The add-in and instructions can be obtained from the following website: http://www.statanalysis.co.uk , with the add-in also capable of being implemented in Stata. Evan's talk then continued to describe some common estimation procedures used for random effects models in meta-analyis – the Der Simonian-Laird moment based estimator, maximum likelihood, restricted maximum likelihood, profile likelihood and permutation methods. Evan presented a simulation study that he conducted to compare the performance of these estimation procedures in the context of a random effects meta-analysis model with varying distributional assumptions and varying levels of heterogeneity. He concluded that while the results were consistent across distributions, permutation methods were best for type 1 error but lacked power, profile likelihood were best for small studies and when heterogeneity was present and REML and DL methods were only appropriate when heterogeneity is low. Evan ended his talk by returning to the $I^2 = 0$ problem. He indicated that this may be due to biased estimates or negative I^2 values being set to zero. He suggested that a better measure of heterogeneity was needed.