



# Twenty years of meta-analysis and evidence synthesis methods: a personal reflection

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My first exposure to meta-analysis was reading publications by Richard Peto and others around 1980. It seemed so obviously the right thing to do when there were multiple studies, and it seemed statistically fairly straightforward. Like so many things, the principles are indeed simple, but realization that the practice is not so simple arrives gradually. I gave a talk on meta-analysis as early as 1981 and then wrote a long paper reviewing statistical methods and other issues including methodological quality (please see extract pp. 3–11).<sup>1</sup> For reasons I do not remember now, I never submitted it for publication.

The importance of sound methods was recognized from the earliest days of The Cochrane Collaboration. An early meeting on statistical methods was organized by the UK Cochrane Centre in July 1993, masterminded by Iain Chalmers. That meeting was my first active contribution to The Cochrane Collaboration, as it was shortly to become, although I had enjoyed Cochrane hospitality at the opening of the UK Cochrane Centre in 1992. I never imagined the current status of the Collaboration nor that I would still be involved 20 years later. It is hard not to wonder whether any of this astonishing achievement might have happened without the pioneering work of Iain Chalmers and many colleagues in systematically reviewing the peri-natal research literature in the 1980s.

As time went on we have realized that there are many hidden problems, nuances, extensions and so on. And there have been big changes in strategy. The biggest impact probably came from the early realization that the statistical analysis is a relatively simple part of a rather complex set of actions which we now label as a systematic review.

The basic elements of systematic reviews existed when the Collaboration was founded. All of those elements are methodology and all have evolved and advanced over 20 years. There have also been considerable advances in strategic thinking, in the technology [data analysis methods and review software (RevMan)] and in the range and depth of topics addressed by Methods Groups. Also, the scope of Cochrane Reviews has extended in several ways, both in terms of the type of question (now including not just healthcare interventions but also diagnostic test accuracy and more recently prognostic questions) and also in efforts to evaluate evidence across systematic reviews.

As an example, the need to assess the 'quality' of individual studies was there from the start. How this is tracked has evolved considerably, culminating in the Risk of Bias tool, which is still evolving.

The 16 Methods Groups represent a tremendous pool of expertise in methodological development of unrivalled diversity. It is impossible to predict which methodological issues will arise over the next 5–10 years (although I was asked to try to do so!) but I am sure that the current Methods Groups, and perhaps some new ones, will continue to address a very testing agenda. Two big areas that it would be valuable to address are the challenge of reducing the time and effort that goes into conducting a Cochrane Review while maintaining a rigorous approach, and presenting the outputs in a variety of formats suited to different readerships.

<sup>1</sup>Paper presented at the International Epidemiological Association, Edinburgh, August 1981. Reproduced with kind permission of the James Lind Alliance.