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Systematic Reviews in Health Care: Meta-analysis in Context. Edited by M Egger, GD Smith, DG Altman. London: BMJ Publishing Group, 2001:487 p. ISBN 0–7279–1488–X. Price: GBP 50. [This book can currently be ordered using the following e-mail address: orders@bmjbookshop.com]

The aim of *Systematic Reviews,* which was first published in 1994, and revised in this version in 2001, is to provide an introduction to the science of reviewing biomedical research. The rationale of the book is the current overwhelming amount of biomedical papers that is published every year and makes it impossible for anyone to keep up-to-date on current knowledge. Thus reviews are needed to provide manageable information on which decisions on health policy, and individual treatment, can be based. Consequently the knowledge and skill of appraising systematic reviews has become of outmost importance for any decision maker.

The editors of *Systematic Reviews,* Matthias Egger, George Davey Smith and Douglas G Altman, as well as the 27 other authors for the 26 chapters, are leading experts in the field. The book is divided into an introduction and five parts.

The introduction deals with the rationale, potentials, and promise of systematic reviews. Along with historical notes, the reasons for the superiority of a formal meta-analysis over the narrative review are presented.

Part I consists of systematic reviews of controlled trials. The first chapter handles the principles of and procedures for systematic reviews. The steps in conducting a systematic review are illustrated, as are the methods for estimating heterogeneity, combined effect measure, Bayesian meta-analyses, and sensitivity analyses. A separate chapter has been dedicated to the problems and limitations of conducting systematic reviews. The reasons and remedies for publication and other biases are presented. A chapter on identifying randomized trials depicts the Medline, Embase and Cochrane projects, and advice on supplementary database searches and handsearching is provided. In the chapter on the assessment of the quality of randomized controlled trials, 25 scales of validity are presented, and the strengths and weaknesses of the scales are discussed. The benefits and disadvantages of obtaining individual patient data are demonstrated in one chapter. Another chapter is dedicated to the assessment of the quality of reports of systematic reviews, and the QUOROM (Quality of Reporting of Meta-analyses) statement (1) as a "gold standard" is compared with 21 checklists and three scales.

Part II deals with variability within and between studies. In the first chapter the pitfalls of making subgroup analyses in a meta-analysis of randomized trials are presented, and their avoidance is discussed. One chapter is devoted to the pivotal issue of clinical and statistical heterogeneity, and illustrative examples are presented. The impact of the underlying risk of the treatment benefit is dealt with in a separate chapter, and valid statistical approaches, including software, are presented. In the investigation of publication and other biases the funnel plot and other graphic methods are presented.

Part III handles systematic reviews of observational studies. The first chapter highlights the need for and fallacies of systematic reviews of observational studies. The chapter on systematic reviews of prognostic variables includes advice on how to identify relevant studies, how to assess the methodological validity, how to adjust for covariates, and how to handle with continuous predictor variables. Methodological problems are also discussed, and two illustrative examples are presented. One chapter is devoted to the evaluation of studies on diagnostic and screening tests. Summary measures of diagnostic accuracy are presented, as are the different phases of the systematic review. In addition, the sources of heterogeneity and statistical methods for the pooling of summary measures are pointed out.

Part IV deals with statistical methods and computer software. Formulas for estimates of effect from individual studies and of the treatment effect from combining trial results are presented. Methods for investigating sources of heterogeneity are depicted. Three examples and a table of the considerations in choosing a method for a meta-analysis are provided. One chapter describes effect measures of trials with binary outcomes. Both commercial and freely available meta-analytic software is presented. It is emphasized that the software for meta-analyses have developed rapidly over the past 5 years and will probably continue to do so. Stata™ software is described more closely in a separate chapter.

Part V handles the topic of using systematic reviews in practice. In applying the results of systematic reviews at the bedside, the following four considerations are suggested: the applicability of the evidence to an individual patient, the feasibility of the intervention in a particular setting, the benefit : risk ratio for an individual patient, and the incorporation of patient values and preferences. Dangers and cautions concerning the numbers needed to treat (NNT), derived from meta-analyses, are dealt with in one chapter. The use of systematic reviews for clinical guideline development is presented in one chapter. The chapter on evidence-based policy-making presents concepts of evidence-, resource- and

value-driven decision making. The chapter on systematic reviews for economic evaluation suggests that systematic reviews of the effects of health care be used in economic evaluations. It is emphasized that systematic reviews of economic studies may lead to biased estimates. The methods for systematic reviews for economic evaluation are currently being studied by the Cochrane Health Economics Methods Group. The fundamental role of systematic reviews is underlined in the chapter on the topic of using systematic reviews and registers of ongoing trials for trial design, monitoring, and reporting.

Part VI of the book deals with the Cochrane Collaboration. The first chapter describes the history, mission, principles, organization and output of the Collaboration. The chapter on the Cochrane Collaboration in the 21st century introduces the ethical, social, logistical, and methodological challenges that the Collaboration must meet and gives one reason why these challenges must be met.

In the beginning of each chapter three to seven summary points are listed on the essence of the content. All the chapters have several headings that make it easy to get an overview of the content. The text has been written in a concise manner and the content can be readily understood. Illustrative examples are provided for the most important issues. There is a discussion at the end of many of the chapters. The literature is up-to-date. As the book also includes an excellent index, it is easy to find the information one needs, and the book can be used both as a textbook and as a handbook.

It is evident that systematic reviews will be the cornerstone of (evidence-based) medicine in the future. This up-to-date presentation of the possibilities and pitfalls of systematic reviews can be recommended to anyone who makes decisions bearing impact on health.

Reference

1. Moher D, Cook DJ, Eastwood S, Olkin I, Rennie D, Stroup DF. Improving the quality of reports of meta-analyses of randomized controlled trials: the QUOROM statement. Lancet 1999;354:1896–1900.

Antti Malmivaara, MD
Department of Occupational Medicine
Finnish Institute of Occupational Health
Helsinki, Finland