

Editorial Introduction

Systematic Reviews in Health Research

Systematic reviews and meta-analyses are widespread in the health sciences and can play a critical role in advancing evidence-informed decision-making by practitioners, policymakers, and researchers. Despite a solid foundation of methodological standards for best practices in evidence synthesis, the field of research synthesis methods is still relatively young and thus continues to experience rapid methodological and statistical innovation. In such a rapidly evolving field, there is a need for comprehensive guidance on current best practices for the conduct of systematic reviews and meta-analyses in the health sciences.

One of the most influential and complete texts on this subject is *Systematic Reviews*, which was published in its first edition in 1995 (Chalmers & Altman), its second edition *Systematic Reviews in Health Care: Meta-analysis in Context* in 2001 (Egger, Smith, & Altman), and now with its third edition *Systematic Reviews in Health Research* forthcoming in 2020 (Egger, Altman, Davey Smith & Higgins). The third edition of the book addresses a range of critical issues in research synthesis, including core concepts and principles of systematic reviewing, synthesis methods for meta-analyses of randomized trials, synthesis methods for other types of studies such as observational, diagnostic, prognostic and genetic association studies, and advanced meta-analytic methods for handling complex types of data. We are pleased to announce that, beginning with the current issue, *Research Synthesis Methods* will be publishing several peer-reviewed manuscripts that have been adapted from chapters in the third edition of *Systematic Reviews in Health Research* and address a range of modern synthesis methods.

The first three manuscripts to appear in the journal over the next several issues will focus on special topics related to the conduct and interpretation of findings from research syntheses. First, Zhang, Akl, & Schünemann (2019) focus on the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach for assessing the certainty of evidence in systematic reviews and informing guideline development efforts. The authors review the GRADE process for establishing the level of certainty in evidence and discuss how the certainty of evidence in systematic reviews can be used to inform guideline development and evidence-informed decision-making under the GRADE Evidence to Decision Framework.

Second, Bowden & Holmes (2019) provide an introduction to Mendelian randomization and the ways that meta-analysis methods have been used to aid collaborative analysis synthesizing individual data across epidemiological studies as well as synthesizing genome wide association studies. The authors discuss methods for detecting and accounting for heterogeneity and bias in these types of research syntheses and advances in web-based tools that can be used to link genetic and trait summary data from millions of samples.

Third, Mavridis & White (2019) discuss missing outcome data in meta-analysis, describing the assumptions underlying different methods for handling missing data and the bias that can arise in meta-

analyses synthesizing evidence from primary studies with missing data. The authors describe two methods that can be used under different plausible alternative assumptions about missing data.

Subsequent issues in the journal will include several additional manuscripts adapted from chapters in *Systematic Reviews in Health Research*, which will address other advanced treatments in research synthesis methods such as the use of individual participant data in syntheses, statistical methods for dose-response meta-analyses, synthesis methods for observational studies of etiology and burden of disease, and methods for investigating and dealing with publication and other reporting biases.

Although *Systematic Reviews in Health Research* primarily uses examples of evidence syntheses in health care contexts, the methodological and statistical guidance provided therein is widely applicable to other social, behavioral, educational, health, and life-science contexts. The third edition of the book provides accessible presentation of both introductory and advanced synthesis methods and is supplemented by online practical exercises in both R and Stata that should be valuable to students and researchers interested in learning how to apply the methods covered in the volume. Given the comprehensive scope and depth of content covered, the book will be useful to both new and experienced producers of systematic review and meta-analyses.

We hope that the new edition of the book will prove a stimulating and useful resource for those working in research synthesis. It should be a valuable addition to the bookshelf of anyone undertaking a systematic review, to those embarking on research into systematic review methods, and to those just wishing to learn about systematic reviews in more detail. The book is dedicated to the memory of Douglas Altman, who made immense contributions to the field and who is greatly missed by his co-editors among many others.

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