Evidence Synthesis for Decision Making in Healthcare
Nicky J. Welton, Alexander J. Sutton, Nicola Cooper, Keith R. Abrams, A. E. Ades

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DESCRIPTION

In the evaluation of healthcare, rigorous methods of quantitative assessment are necessary to establish interventions that are both effective and cost-effective. Usually a single study will not fully address these issues and it is desirable to synthesize evidence from multiple sources. This book aims to provide a practical guide to evidence synthesis for the purpose of decision making, starting with a simple single parameter model, where all studies estimate the same quantity (pairwise meta-analysis) and progressing to more complex multi-parameter structures (including meta-regression, mixed treatment comparisons, Markov models of disease progression, and epidemiology models). A comprehensive, coherent framework is adopted and estimated using Bayesian methods.

Key features:

• A coherent approach to evidence synthesis from multiple sources.

• Focus is given to Bayesian methods for evidence synthesis that can be integrated within cost-effectiveness analyses in a probabilistic framework using Markov Chain Monte Carlo simulation.

• Provides methods to statistically combine evidence from a range of evidence structures.

• Emphasizes the importance of model critique and checking for evidence consistency.

• Presents numerous worked examples, exercises and solutions drawn from a variety of medical disciplines throughout the book.

• WinBUGS code is provided for all examples.
Evidence Synthesis for Decision Making in Healthcare is intended for health economists, decision modelers, statisticians and others involved in evidence synthesis, health technology assessment, and economic evaluation of health technologies.

ABOUT THE AUTHOR

Nicky Welton, Department of Social Medicine, University of Bristol
Dr Welton’s research includes Bayesian statistical modeling in epidemiology and evidence synthesis and evidence consistency.

Alex Sutton, Department of Health Sciences, University of Leicester
Dr Sutton, senior lecture in medical statistics, has a primary research interest in meta-analysis. This specifically includes methods to combine evidence from disparate sources, and methods to deal with the problem of publication bias. With numerous published papers in a variety of journals he has also collaborated on over 15 substantive evidence synthesis projects. He is lead author on one of the first textbooks on meta-analysis in medicine and is co-editor on a recently published Wiley book on publication bias.

Nicola Cooper, Department of Health Sciences, University of Leicester
Dr Cooper’s primary research interest is in the interface and integration of medical statistics and health economics. This specifically includes methods for statistical modelling of cost data, integration of evidence synthesis within a decision-modelling context, handling of missing data in economic evaluations conducted alongside clinical trials, and the application of Bayesian statistical methods to all of the above.

Keith Abrams, Department of Health Sciences, University of Leicester
Professor Abrams’ research interests include the development and application of Bayesian methods in healthcare evaluation, systematic reviews and meta-analysis, and the joint modeling of longitudinal and time-to-event data. He has published dozens of articles in numerous international journals and is the co-author of two Wiley books in this area.

Anthony E Ades, Department of Social Medicine, University of Bristol with over 30 published articles in the last three years, Professor Ades' research interests include statistical methods for multi-parameter evidence synthesis in epidemiology, disease mapping and economic evaluation; Bayesian decision theory and the expected value of information; statistical and epidemiological methods in infectious disease surveillance.
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