

# Contents

Preface	iii
Contributors	ix
<b>I General Overview</b>	
1. Bayesian Methods in Health-Related Research <i>Donald A. Berry and Dalene K. Stangl</i>	3
2. Bayesian Approaches to Randomized Trials <i>David J. Spiegelhalter, Laurence S. Freedman, and Mahesh K. B. Parmar</i>	67
3. Bayesian Epidemiology <i>Deborah Ashby and Jane L. Hutton</i>	109
<b>II Assessing Probabilities</b>	
4. Elicitation of Prior Distributions <i>Kathryn Chaloner</i>	141
5. Priors for the Design and Analysis of Clinical Trials <i>Joseph B. Kadane and Lara J. Wolfson</i>	157
<b>III Decision Problems</b>	
6. A Weibull Model for Survival Data: Using Prediction to Decide When to Stop a Clinical Trial <i>Jian Qian, Dalene K. Stangl, and Stephen George</i>	187
7. Decision Models in Clinical Recommendations Development: The Stroke Prevention Policy Model <i>Giovanni Parmigiani, Marek Ancukiewicz, and David Matchar</i>	207

8.	Dose-Response Analysis of Toxic Chemicals <i>Vic Hasselblad and Annie M. Jarabek</i>	235
9.	Expected Utility as a Policy-Making Tool: An Environmental Health Example <i>Lara J. Wolfson, Joseph B. Kadane, and Mitchell J. Small</i>	261
<b>IV Design</b>		
10.	Bayesian Hypothesis Testing: Interim Analysis of a Clinical Trial Evaluating Phenytoin for the Prophylaxis of Early Post-Traumatic Seizures in Children <i>Roger J. Lewis</i>	279
11.	Inference and Design Strategies for a Hierarchical Logistic Regression Model <i>Merlise Clyde, Peter Müller, and Giovanni Parmigiani</i>	297
<b>V Model Selection</b>		
12.	Model Selection for Generalized Linear Models via GLIB: Application to Nutrition and Breast Cancer <i>Adrian E. Raftery and Sylvia Richardson</i>	321
<b>VI Hierarchical Models</b>		
13.	Bayesian Analysis of Population Pharmacokinetic and Instantaneous Pharmacodynamic Relationships <i>Amy Racine-Poon and Jon Wakefield</i>	355
14.	Bayesian and Frequentist Analyses of an In Vivo Experiment in Tumor Hemodynamics <i>Russell D. Wolfinger and Gary L. Rosner</i>	389
15.	Bayesian Meta-Analysis of Randomized Trials Using Graphical Models and BUGS <i>Teresa C. Smith, David J. Spiegelhalter and Mahesh K. B. Parmar</i>	411
16.	Hierarchical Analysis of Continuous-Time Survival Models <i>Dalene K. Stangl</i>	429
17.	Hierarchical Bayesian Linear Models for Assessing the Effect of Extreme Cold Weather on Schizophrenic Births <i>William DuMouchel, Christine Waternaux, and Dennis Kinney</i>	451
18.	Fitting and Checking a Two-Level Poisson Model: Modeling Patient Mortality Rates in Heart Transplant Patients <i>Cindy L. Christiansen and Carl N. Morris</i>	467

**VII Other Topics**

19. Analyzing Rodent Tumorigenicity Experiments Using Expert Knowledge 503  
*Jane C. Lindsey and Louise M. Ryan*
20. Assessing Drug Interactions: Tamoxifen and Cyclophosphamide 531  
*Keith Abrams, Deborah Ashby, Joan Houghton, and Di Riley*
21. Bayesian Subset Analysis of a Clinical Trial for the Treatment of HIV Infections 555  
*Richard Simon, Dennis O. Dixon, and Boris Freidlin*
22. Bayesian Modeling of Binary Repeated Measures Data with Application to Crossover Trials 577  
*James Albert and Siddhartha Chib*
23. A Comparative Study of Perinatal Mortality Using a Two-Component Mixture Model 601  
*Petros Dellaportas, David A. Stephens, Adrian F. M. Smith, and Irwin Guttman*
24. Change-Point Analysis of a Randomized Trial on the Effects of Calcium Supplementation on Blood Pressure 617  
*Lawrence Joseph, David B. Wolfson, Roxane du Berger, and Roseann M. Lyle*
25. Bayesian Predictive Inference for a Binary Random Variable: Survey Estimation of the Quality of Care that Radiation Therapy Patients Receive 651  
*Michael Racz and J. Sedransk*
- Index 669