

HARVEY CHECKOWAY    NEIL PEARCE  
DAVID KRIEBEL



RESEARCH METHODS IN

OCCUPATIONAL  
EPIDEMIOLOGY

second edition

# Contents

1. Introduction, 3
  - Historical Background, 4
  - The Scope of Occupational Epidemiology, 8
2. Characterizing the Workplace Environment, 17
  - General Concepts of Exposure and Dose, 18
  - Approaches to Exposure Assessment, 21
  - Reliability and Validity of Exposure Assessment, 43
  - Combining Exposure Data from Multiple Sources, 49
3. Overview of Study Designs, 59
  - Case Series, 59
  - Cohort Studies, 61
  - Case-Control Studies, 66
  - Proportionate Mortality Studies, 70
  - Cross-sectional Studies, 72
  - Connections between Study Designs, 73
4. Precision and Validity in Study Design, 83
  - Precision, 83
  - Validity, 89
  - Effect Modification and Estimation of Joint Effects, 112
5. Cohort Studies, 123
  - Basic Cohort Design, 123
  - Methods of Data Analysis, 136
  - Strategies of Analysis, 147
  - Planning a Cohort Study, 173
6. Case-Control Studies, 179
  - Basic Study Design, 180
  - Selection of Cases, 181

Selection of Controls, 183  
Exposure Data, 198  
Data Analysis, 199

**7. Cross-sectional and Repeated Measures Studies, 211**

Study Design Features, 211  
Sources of Health and Exposure Data, 218  
Subject Selection Options, 219  
Methods of Data Analysis, 226  
Sources of Bias in Cross-sectional Studies, 236  
Planning Cross-sectional and Repeated Measures Studies, 241

**8. Occupational Health Surveillance, 247**

Defining Surveillance, 248  
Selecting Health Outcomes for Surveillance, 248  
Surveillance Study Designs, 249  
Surveillance in Defined Occupational Cohorts, 249  
Surveillance in the General Population, 252

**9. Advanced Statistical Analysis, 263**

Continuous Outcome Data, 264  
Dichotomous Outcome Data, 270  
Model Specification, 280

**10. Exposure and Dose Modeling, 295**

The Starting Point: The Exposure Profile, 296  
Summary Measures of Exposure, 297  
Understanding the Exposure–Dose Relation, 300  
Is Dose the Right Metric? 308  
The Dosimetric Model, 310  
Incorporating Inter-individual Variability into Dose Metrics, 318  
Exposure Weighting, 319  
Induction Time Analysis, 321  
Multistage Cancer Model, 323  
Choosing the Best Measure of Exposure or Dose, 325  
Strengths and Limitations of Dose Modeling, 326

**11. Special Applications of Occupational Epidemiology, 331**

Meta-Analysis, 331  
Data Pooling, 343  
Risk Assessment, 346

Index, 359