

Contents

Preface

- 1 Biostatistics in Health and Disease**
 - 1.1 Difference Between Statistics And Biostatistics 1
 - 1.2 Sources of Medical Uncertainties 2
 - 1.3 Managing Medical Uncertainties 7
 - Exercises 12*
 - Solutions to Exercises 13*

- 2 Types of Data and Methods of Data Collection**
 - 2.1 Types of Data 17
 - 2.2 Data Collection 22
 - Exercises 26*
 - Solutions to Exercises 27*

- 3 Quality of Data and Medical Tests**
 - 3.1 Quality of Data 30
 - 3.2 Quality of Medical Tests 32
 - Exercises 38*
 - Solutions to Exercises 40*

- 4 Sources of Existing Medical Data**
 - 4.1 Records of Patients at Different Sources 43
 - 4.2 Government Records 46
 - 4.3 Reports of Various Agencies 53
 - 4.4 Electronic Resources 56
 - 4.5 Health Information System 59
 - Exercises 60*
 - Solutions to Exercises 61*

5 Assessment of Morbidity

- 5.1 Preliminaries 65
- 5.2 Indicators of Morbidity 67
- Exercises* 73
- Solutions to Exercises* 74

6 Indicators of Mortality

- 6.1 Specific Indicators of Mortality 77
- 6.2 Crude and Standardized Death Rates 83
- 6.3 Expectation of Life 87
- Exercises* 89
- Solutions to Exercises* 92

7 Fertility and Demography Indicators

- 7.1 Fertility Indicators 97
- 7.2 Demography 102
- Exercises* 108
- Solutions to Exercises* 110

8 Indicators of Social and Mental Health

- 8.1 Indicators of Social Health 114
- 8.2 Indicators of Mental Health 116
- 8.3 Indicators of Health Care Services 120
- Exercises* 123
- Solutions to Exercises* 124

9 Numerical Summarization of Medical Data

- 9.1 Tabular Representation 127
- 9.2 Measures of Location 130
- 9.3 Dispersion or Variability 135
- Exercises* 140
- Solutions to Exercises* 142

10 Graphs in Health and Disease

- 10.1 Bar, Pie, Line, and Scatter Diagrams 145
- 10.2 Representation of a Frequency Distribution 149
- 10.3 Medical Charts and Health Maps 151
- Exercises* 153
- Solutions To Exercises* 155

11 Probability and Reference Range of Medical Parameters

- 11.1 Summarizing Uncertainties: Probability 159
- 11.2 Reference Range of Medical Parameters 163
- Exercises* 168
- Solutions to Exercises* 169

12 Descriptive Studies—Sampling

- 12.1 Some Concepts On Sampling 173
- 12.2 Random Sampling 175
- 12.3 Non-random Sampling 178
- Exercises* 181
- Solutions to Exercises* 182

13 Prospective, Retrospective and Cross-sectional Studies

- 13.1 Prospective Studies 186
- 13.2 Retrospective Studies 187
- 13.3 Cross-sectional Studies 190
- 13.4 Comparative features 191
- Exercises* 191
- Solutions to Exercises* 193

14 Experiments and Clinical Trials

- 14.1 Essentials of Experimentation 196
- 14.2 Clinical Trials 198
- Exercises* 201
- Solutions to Exercises* 202

15 Standard Error and Confidence Interval

- 15.1 Essential Concepts 205
- 15.2 Confidence Interval (CI) for Means 207
- 15.3 Confidence Interval for Proportions 213
- Exercises* 215
- Solutions to Exercises* 217

16 General Principles of Statistical Tests

- 16.1 Errors in Medical Decisions 220
- 16.2 Hypotheses, P-Value and Power 221
- 16.3 One-tailed and Two-tailed Tests 224
- Exercises* 226
- Solutions to Exercises* 228

17 Statistical Significance—Parametric and Non-parametric Tests

17.1	Parametric Tests	232
17.2	Non-Parametric Tests	239
	<i>Exercises</i>	241
	<i>Solutions to Exercises</i>	242

18 Strength of Association and Chi-square Tests

18.1	Strength of Association: Relative Risk and Odds Ratio	246
18.2	Chi-Square Test	251
	<i>Exercises</i>	255
	<i>Solutions to Exercises</i>	258

19 Regression and Correlation

19.1	Nature of Relationship: Regression	263
19.2	Strength of Relationship: Correlation	266
19.3	Causal and Non-causal Relationship	269
	<i>Exercises</i>	271
	<i>Solutions to Exercises</i>	272

20 Sample Size in Medical Studies

20.1	Sample Size for Descriptive Studies	274
20.2	Sample Size for Analytical Studies	278
	<i>Exercises</i>	280
	<i>Solutions to Exercises</i>	281

Appendix

Index