

DETAILED CONTENTS

<i>Preface</i>	xix
Part I Concepts, Principles, and Applications	1
Chapter 1. An Introduction to Managerial Epidemiology	3
<i>Steven T. Fleming, Thomas Tucker, and F. Douglas Scutchfield</i>	
Case Study 1.1. Group Health East.....	7
Resources.....	18
Chapter 2. Infectious Disease Epidemiology	19
<i>Glyn G. Caldwell and Steven T. Fleming</i>	
Agent, Host, and Environment	20
Transmission	24
Prevention.....	28
Case Study 2.1. Food Poisoning Outbreak at Bluegrass Hospital.....	31
Epidemic Investigation.....	33
Case Study 2.2. Outbreak of Influenza in a New York Nursing Home.....	39
Summary	41
End-of-Chapter Case Exercises.....	42
References.....	43
Chapter 3. Measuring and Interpreting Morbidity	49
<i>Steven T. Fleming and F. Douglas Scutchfield</i>	
Population Health.....	49
The Nature and Definition of Disease	50
Natural History of Disease	51
Sources of Morbidity Data	53
Measuring Morbidity	54
Case Study 3.1. Product Lines for Group Health East	57

	Screening	59
	Case Study 3.2. Breast Cancer Screening.....	62
	Case Study 3.3. Prostate Cancer Screening.....	66
	Summary	70
	End-of-Chapter Case Exercises.....	70
	References.....	72
Chapter 4.	Healthcare Planning and Needs Assessment	75
	<i>Steven T. Fleming, F. Douglas Scutchfield, and Joel Lee</i>	
	Community Health Planning Tools and	
	Benchmarks	78
	Case Study 4.1. Eastern Kentucky Health	84
	Institutional Planning.....	86
	Case Study 4.2. Determining Bed Demand for	
	Cardiac Patients Age 65–84.....	88
	A Strategic Planning Model.....	92
	Marketing	94
	Needs Assessment	96
	Human Resources Planning	98
	Summary	101
	End-of-Chapter Case Exercises.....	102
	References.....	103
Chapter 5.	Quality of Care Measurement	107
	<i>Steven T. Fleming and Sarah Wackerbarth</i>	
	Epidemiology and Quality.....	109
	Rates and Surveillance.....	111
	Case Study 5.1. MRSA Surveillance at University	
	Hospital	113
	Outcomes of Care—Complication Rates	115
	Case Study 5.2. Risk-Adjusted Complication Rates	
	in a Small Rural Hospital.....	118
	Managed Care.....	120
	Avoidable Hospitalizations	120
	Quality Indicators	122
	Case Study 5.3. Inpatient Quality of Care	
	Indicators for Bluegrass Hospital	124
	Total Quality Management.....	127
	Summary	132
	End-of-Chapter Case Exercises.....	133
	References.....	134

Chapter 6.	Mortality and Risk Adjustment.....	137
	<i>Steven T. Fleming and F. Douglas Scutchfield</i>	
	Measuring Mortality with Rates	139
	Comparing Mortality Across Time, Place, and Person	140
	Case Study 6.1. Breast Cancer Mortality Rates and Migration	147
	Standardization of Mortality Rates	150
	Case Study 6.2. Age and Gender Adjustment in Two Managed Care Organizations	152
	Risk-Adjusted Mortality Rates	155
	Case Study 6.3. Risk Adjustment with Contingency Tables—State of Pennsylvania	160
	Case Study 6.4. Risk Adjustment with Multivariate Techniques—State of New York	163
	Summary	165
	End-of-Chapter Case Exercises.....	166
	References.....	169
Chapter 7.	Descriptive Epidemiology: Person, Place, Time	171
	<i>Steven T. Fleming and Jeffery Jones</i>	
	Descriptive Epidemiology: The Person	171
	Case Study 7.1. Infant Mortality Disparities by Race	175
	Descriptive Epidemiology: Place.....	179
	Spot Maps.....	179
	Clusters.....	181
	Geographic Information Systems.....	182
	Case Study 7.2. HIV Clinics in Kentucky	187
	Descriptive Epidemiology: Time.....	189
	Summary	191
	End-of-Chapter Case Exercises.....	192
	References.....	194
Part II	Epidemiology and Finance.....	197
Chapter 8.	Epidemiology and Financial Management	199
	<i>Keith E. Boles and Steven T. Fleming</i>	
	Healthcare Delivery: Reactive or Proactive?	199
	Healthcare Risks.....	201
	The Role of Epidemiology in Finance	203

	Capitation: An Introduction.....	205
	Capitation Basics	208
	Risk Adjustment: The Basics	210
	Case Study 8.1. Incorporating Health Risks into Capitation Rates	214
	Adjusting Capitation Rates.....	217
	Case Study 8.2. Group Health East: Risk Factors and Capitation Rates	220
	Pay for Performance.....	224
	Breakeven Analysis	225
	Summary	227
	End-of-Chapter Case Exercises.....	227
	References.....	228
Chapter 9.	Cost-Effectiveness Analysis.....	231
	<i>Steven T. Fleming</i>	
	Cost-Effectiveness Ratios.....	232
	Cost-Effectiveness Model	232
	Program Specification	233
	Measuring Effectiveness	234
	Quality-Adjusted Life Years	235
	Case Study 9.1. The Oregon Medicaid Prioritization of Health Services Program	238
	Biased Estimates.....	239
	Measuring Costs	240
	Cost–Benefit Analysis	244
	Choosing Among Programs	245
	Uncertainty	247
	Case Study 9.2. Cost-Effectiveness of Health Insurance	248
	Summary	251
	Case Study 9.3. CEA for Targeted or Universal Prostate Cancer Testing.....	252
	End-of-Chapter Case Exercises.....	257
	References.....	259
Part III	Evidence-Based Management And Medicine	261
Chapter 10.	Statistical Tools	265
	<i>Mary Kay Rayens and Thomas C. Tucker</i>	

Descriptive and Analytical Epidemiology	265
Levels of Measurement.....	266
Sampling.....	266
Descriptive Statistics for Continuous Variables.....	267
Descriptive Statistics for Categorical Variables	271
Inferential Statistics	272
<i>z</i> Test for Differences in Proportions	277
Confidence Intervals	278
Multivariate Models	280
Summary	281
End-of-Chapter Case Exercises.....	281
Additional Readings	282
References.....	282
Chapter 11. Case–Control Studies	283
<i>Steven T. Fleming</i>	
Selection of Cases and Controls	284
Exposure.....	285
Relative Risk in a Case–Control Study.....	286
Confounding	288
Case Study 11.1. Coffee and Pancreatic Cancer.....	292
Sources of Bias	292
Case Study 11.2. Smoking and Low Birth Weight	
Newborns.....	299
Case Study 11.3. Fen-Phen and Primary Pulmonary	
Hypertension.....	303
Cross-Sectional Studies	305
Case–Control Advantages and Disadvantages	306
Summary	307
End-of-Chapter Case Exercises.....	307
References.....	309
Chapter 12. Cohort Studies.....	313
<i>John N. Lewis and Steven T. Fleming</i>	
Selection of Cohorts	316
Exposure.....	317
Relative Risk in a Cohort Study	321
Case Study 12.1. Scottish Heart Study.....	322
Measures of Disease Burden.....	323
Case Study 12.2. The Unknown Cohort Study	324

	Measuring Incidence	326
	Case Study 12.3. Smoking, Heart Disease, and Lung Cancer	328
	Case–Control and Cohort Studies	331
	Case Study 12.4. Smoking and Prostate Cancer	333
	Survey Methodology	334
	Advantages and Disadvantages	335
	Summary	335
	End-of-Chapter Case Exercises	336
	References	338
Chapter 13.	Randomized Clinical Trials	341
	<i>Steven T. Fleming</i>	
	Randomization	343
	Historical Controls and Crossover Studies	345
	Methods of Randomized Clinical Trials	346
	Sample Size	346
	Duration and Masking	349
	Integrity of the Randomization	350
	Ethical Considerations	353
	Case Study 13.1. The RAND Health Insurance Experiment	354
	Factorial Design	356
	Case Study 13.2. Vitamin E and n-3 Polyunsaturated Fatty Acids After Myocardial Infarction	357
	Case Study 13.3. Inpatient Staffing at Henry Ford Hospital	361
	Meta-Analysis	362
	Community Trials, Cluster Randomization, and Ecological Studies	364
	Summary	366
	Case Exercises	367
	References	369
Chapter 14.	Clinical Epidemiology and Decision Making	373
	<i>Kevin A. Pearce, Steven T. Fleming, and F. Douglas Scutchfield</i>	
	Experience and Tradition in Medical Practice	374
	The Evidence Base of Clinical Practice	375
	The Clinical Encounter	380

Clinical-Encounter Vignette Part I: Making a Diagnosis for a Patient Presenting with Chest Pain	381
Clinical-Encounter Vignette Part II: Treatment Options for a Patient Diagnosed with GERD.....	385
Prevention.....	387
Clinical-Encounter Vignette Part III: Prevention and Control Strategies.....	389
Cost-Effectiveness and the Number Needed to Treat	392
Clinical-Encounter Vignette Part IV: Family History and Number Needed to Treat	393
The Future.....	394
Case Study 14.1. Clinical Decision-Making Toolbox.....	397
End-of-Chapter Case Exercises.....	405
References.....	407

Part IV Applications of Epidemiology to Specific Diseases..... 411

Chapter 15. Cardiovascular Disease	413
<i>Steven R. Browning and Steven T. Fleming</i>	
The Epidemiology of CVD	414
Trends in CVD Mortality.....	415
The Geographic Distribution of CVD	418
The Biology of CVD and Risk Factors	421
Managerial and Economic Considerations with Screening.....	424
Case Study 15.1. Screening for CAC.....	427
Other Considerations for Screening Tests.....	431
Cost-Effectiveness of CAC Screening	432
Case Study 15.2. Cost-Effectiveness of Gastric Bypass for Severe Obesity	433
Strategies for the Prevention of CVD	437
Conclusion.....	438
Acknowledgments	439
End-of-Chapter Case Exercises.....	439
References.....	440
 Chapter 16. Human Immunodeficiency Virus Infection.....	445
<i>H. Irene Hall, Kathleen McDavid Harrison, and Steven T. Fleming</i>	

	Diagnoses	446
	Prevalence	448
	Mortality	450
	Screening and Diagnostic Tests	451
	Case Study 16.1. HIV-1 Enzyme Immunoassay for HIV	452
	Prevention and Control Measures	455
	Measures of Quality of Care	456
	Study Designs Used to Examine Risk Factors	456
	Case Study 16.2 Cost-Effectiveness of HIV Screening	457
	Summary	457
	End-of-Chapter Case Exercises	461
	References	462
Chapter 17.	Alzheimer's Disease	467
	<i>Suzanne L. Tyas and Iris Gutmanis</i>	
	Introduction to Alzheimer's Disease	468
	Impact of Alzheimer's Disease	473
	Case Study 17.1. Alzheimer's Disease Incidence, Prevalence, and Mortality	480
	Diagnosis and Detection	481
	Case Study 17.2. Screening for Cognitive Impairment: The Mini-Mental State Examination	484
	Management and Care	487
	Challenges to the Epidemiologic Study of Alzheimer's Disease	491
	Summary	493
	Case Study 17.3 Study Designs and Measures of Association (Example: Smoking and Alzheimer's Disease)	494
	End-of-Chapter Case Exercises	497
	References	498
Chapter 18.	Epidemiology and Leadership	509
	<i>Steven T. Fleming and James W. Holsinger Jr.</i>	
	Introduction	509
	Definitions and Distinctions	510
	The Role of Epidemiology in Defining Leadership	511
	Epidemiology and the Science and Art of Leadership	513

Epidemiology and Evidence-Based Medicine, Management, and Public Health.....	515
What Is the Evidence?	519
Systems Thinking and Public Health Leadership	522
Complex Adaptive Systems and Public Health Leadership	524
Summary Case Study: Back to the Future	527
Summary	527
References.....	528
<i>Capstone Cases</i>	533
<i>Answers for End-of-Chapter Case Exercises</i>	663
<i>Glossary</i>	683
<i>Appendix</i>	693
<i>About the Contributors</i>	697
<i>About the Editor</i>	701