

Contents

	New to This Edition	ix
	Introduction	xiii
	Preface	xvii
	Acknowledgments	xix
	About the Authors	xxiii
Chapter 1	History and Scope of Epidemiology	1
	Introduction	2
	Epidemiology Defined	8
	Foundations of Epidemiology	15
	Historical Antecedents of Epidemiology	23
	Recent Applications of Epidemiology	41
	Conclusion	48
	Study Questions and Exercises.....	49
	References.....	51
Chapter 2	Practical Applications of Epidemiology	55
	Introduction	56
	Applications for the Assessment of the Health Status of Populations and Delivery of Health Services	59
	Applications Relevant to Disease Etiology.....	83
	Conclusion	101
	Study Questions and Exercises.....	101
	References.....	104

Chapter 3	Measures of Morbidity and Mortality Used in	
	Epidemiology.....	107
	Introduction	108
	Definitions of Count, Ratio, Proportion, and Rate	108
	Risk Versus Rate; Cumulative Incidence.....	121
	Interrelationship Between Prevalence and Incidence	124
	Applications of Incidence Data	126
	Crude Rates	126
	Specific Rates and Proportional Mortality Ratio	138
	Adjusted Rates	144
	Conclusion	151
	Study Questions and Exercises	152
	References.....	155
Chapter 4	Descriptive Epidemiology: Person, Place, Time.....	157
	Introduction	158
	Characteristics of Persons.....	163
	Characteristics of Place	203
	Characteristics of Time	217
	Conclusion	223
	Study Questions and Exercises	223
	References.....	225
	Appendix 4—Project: Descriptive Epidemiology of a Selected Health Problem	233
Chapter 5	Sources of Data for Use in Epidemiology.....	235
	Introduction	236
	Criteria for the Quality and Utility of Epidemiologic Data	239
	Online Sources of Epidemiologic Data	241
	Confidentiality, Sharing of Data, and Record Linkage....	244
	Statistics Derived from the Vital Registration System	247
	Reportable Disease Statistics	254
	Screening Surveys	259
	Disease Registries.....	260
	Morbidity Surveys of the General Population	262
	Insurance Data.....	267
	Clinical Data Sources.....	267
	Absenteeism Data	271
	School Health Programs	272

	Morbidity in the Armed Forces: Data on Active Personnel and Veterans	272
	Other Sources: Census Data	273
	Conclusion	274
	Study Questions and Exercises	274
	References.....	276
Chapter 6	Study Designs: Ecologic, Cross-Sectional, Case-Control.....	279
	Introduction	280
	Observational Versus Experimental Approaches in Epidemiology	281
	Overview of Study Designs Used in Epidemiology	282
	Ecologic Studies.....	287
	Cross-Sectional Studies	294
	Case-Control Studies	303
	Conclusion	317
	Study Questions and Exercises	317
	References.....	319
Chapter 7	Study Designs: Cohort Studies.....	323
	Introduction	324
	Cohort Studies Defined	325
	Sampling and Cohort Formation Options	335
	Temporal Differences in Cohort Designs.....	341
	Practical Considerations.....	344
	Measures of Effect: Their Interpretation and Examples... ..	347
	Summary of Cohort Studies.....	358
	Conclusion	359
	Study Questions and Exercises	362
	References.....	363
Chapter 8	Experimental Study Designs	367
	Introduction	368
	Hierarchy of Study Designs	371
	Intervention Studies.....	373
	Clinical Trials	374
	Community Trials.....	392
	Conclusion	404
	Study Questions and Exercises	405
	References.....	406

Chapter 9	Measures of Effect	409
	Introduction	410
	Absolute Effects	410
	Relative Effects	414
	Statistical Measures of Effect.....	420
	Evaluating Epidemiologic Associations	423
	Models of Causal Relationships	425
	Conclusion	430
	Study Questions and Exercises	431
	References.....	432
	Appendix 9—Cohort Study Data for Coffee Use and Anxiety.....	433
Chapter 10	Data Interpretation Issues.....	435
	Introduction	436
	Validity of Study Designs	437
	Sources of Error in Epidemiologic Research.....	440
	Techniques to Reduce Bias	449
	Methods to Control Confounding.....	450
	Bias in Analysis and Publication.....	454
	Conclusion	456
	Study Questions and Exercises.....	456
	References.....	458
Chapter 11	Screening for Disease in the Community.....	461
	Introduction	462
	Screening for Disease	464
	Appropriate Situations for Screening Tests and Programs.....	468
	Characteristics of a Good Screening Test.....	471
	Evaluation of Screening Tests	471
	Sources of Unreliability and Invalidity.....	476
	Measures of the Validity of Screening Tests	476
	Effects of Prevalence of Disease on Screening Test Results.....	479
	Relationship Between Sensitivity and Specificity.....	482
	Evaluation of Screening Programs.....	483
	Issues in the Classification of Morbidity and Mortality...	485
	Conclusion	486
	Study Questions and Exercises.....	487
	References.....	488
	Appendix 11—Data for Problem 6.....	490

Chapter 12	Epidemiology of Infectious Diseases	491
	Introduction	492
	Agents of Infectious Disease.....	493
	Characteristics of Infectious Disease Agents	496
	Host	497
	The Environment	499
	Means of Transmission: Directly or Indirectly from	
	Reservoir	500
	Measures of Disease Outbreaks.....	506
	Procedures Used in the Investigation of Infectious	
	Disease Outbreaks.....	511
	Epidemiologically Significant Infectious Diseases in the	
	Community	513
	Conclusion	539
	Study Questions and Exercises.....	539
	References.....	542
	Appendix 12—Data from a Foodborne Illness	
	Outbreak in a College Cafeteria	545
Chapter 13	Epidemiologic Aspects of Work and the	
	Environment.....	547
	Introduction	548
	Health Effects Associated with Environmental Hazards ..	550
	Study Designs Used in Environmental Epidemiology	550
	Toxicologic Concepts Related to Environmental	
	Epidemiology.....	555
	Types of Agents	557
	Environmental Hazards Found in the Work Setting.....	571
	Noteworthy Community Environmental Health	
	Hazards.....	575
	Conclusion	588
	Study Questions and Exercises.....	591
	References.....	592
Chapter 14	Molecular and Genetic Epidemiology	599
	Introduction	600
	Definitions and Distinctions: Molecular Versus Genetic	
	Epidemiology.....	605
	Epidemiologic Evidence for Genetic Factors.....	609
	Causes of Familial Aggregation	610
	Shared Family Environment and Familial Aggregation ...	612
	Gene Mapping: Segregation and Linkage Analysis	616

	Genome-Wide Association Studies (GWAS)	626
	Linkage Disequilibrium Revisited: Haplotypes	628
	Application of Genes in Epidemiologic Designs.....	631
	Genetics and Public Health	638
	Conclusion	642
	Study Questions and Exercises.....	642
	References.....	643
Chapter 15	Social, Behavioral, and Psychosocial Epidemiology ...	649
	Introduction	650
	Research Designs Used in Psychosocial, Behavioral, and Social Epidemiology.....	655
	The Social Context of Health	657
	Independent Variables	660
	Moderating Variables.....	669
	Dependent (Outcome) Variables: Physical and Mental Health.....	684
	Conclusion	691
	Study Questions and Exercises.....	692
	References.....	694
Chapter 16	Epidemiology as a Profession.....	701
	Introduction	702
	Specializations within Epidemiology.....	703
	Career Roles for Epidemiologists	705
	Epidemiology Associations and Journals	708
	Competencies Required of Epidemiologists	711
	Resources for Education and Employment	712
	Professional Ethics in Epidemiology	714
	Conclusion	719
	Study Questions and Exercises.....	720
	References.....	721
	Appendix A—Guide to the Critical Appraisal of an Epidemiologic/Public Health Research Article	723
	Appendix B—Answers to Selected Study Questions...	727
	Glossary.....	737
	Index	759