



Public Health 101

Healthy People— Healthy Populations

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Contents

<i>The Essential Public Health Series</i>	xi
Dedication	xiii
Acknowledgments	xv
Preface: What Is <i>Public Health 101</i> All About?	xvii
About the Author	xxi
 Section I Principles of Population Health	 1
 Chapter 1 Public Health: The Population Health Approach	 3
Learning Objectives	3
What Do We Mean by Public Health?	4
How Has the Approach of Public Health Changed Over Time?	5
What Is Meant by Population Health?	7
What Are the Implications of Each of the Four Components of Population Health?	8
Should We Focus on Everyone or On Vulnerable Groups?	9
What Are the Approaches Available to Protect and Promote Health?	10
What Factors Determine the Occurrence of Disease, Disability, and Death?	11
Key Words	14
Discussion Question	15
References	15
 Chapter 2 Evidence-based Public Health	 17
Learning Objectives	17
How Can We Describe a Health Problem?	18

What Do We Need to Know About Rates in Order to Describe a Health Problem?	18
What Is the Burden of Disease in Terms of Morbidity and Mortality and Has It Changed Over Time?	19
Are There Differences in the Distribution of Disease and Can These Differences Generate Ideas or Hypotheses About Their Etiology or Cause?	20
Are the Differences or Changes Used to Suggest Group Associations Artificial or Real?	21
What Is the Implication of a Group Association?	21
Etiology: How Do We Establish Contributory Cause?	22
What Can We Do If We Cannot Demonstrate All Three Requirements to Definitely Establish Contributory Cause?	23
What Does Contributory Cause Imply?	25
Recommendations: What Works to Reduce the Health Impact?	27
Implementation: How Do We Get the Job Done?	30
What Happens After Implementation?	33
Key Words	34
Discussion Questions	35
References	35
Section I: Cases and Discussion Questions	36

Section II Tools of Population Health 39

Chapter 3 Health Informatics and Health Communications 41

Learning Objectives	41
What Are Health Informatics and Health Communications?	41
Where Does Public Health Data Come From?	42
How Is Public Health Information Compiled to Measure the Health of a Population?	42
How Can We Evaluate the Quality of the Presentation of Health Information?	46
What Factors Affect How We Perceive Public Health Information?	46
What Type of Information Needs to Be Combined to Make Health Decisions?	47
How Do We Utilize Information to Make Health Decisions?	49
Key Words	52
Discussion Questions	53
References	53

Chapter 4 Social and Behavioral Sciences and Public Health 55

Learning Objectives	55
How Is Public Health Related to the Social and Behavioral Sciences?	55
How Does Socioeconomic Status Affect Health?	56
What Other Social Factors Explain Differences in Health and Response to Disease?	57

Can Health Behavior Be Changed?	60
Why Are Some Individual Health Behaviors Easier to Change Than Others?	60
How Can Individual Behavior Be Changed?	60
What Stages Do Individuals Go Through in Making Behavioral Changes?	61
How Can Group Behaviors Be Changed?	61
How Can We Combine Individual, Group, and Social Efforts to Implement Behavioral Change?	64
Key Words	65
Discussion Questions	66
References	66
Chapter 5 Health Law, Policy, and Ethics	67
Learning Objectives	67
What Is the Scope of Health Law, Policy, and Ethics?	67
What Legal Principles Underlie Public Health and Health Care?	68
What Do We Mean by Health Policy?	69
How Do Philosophies Toward the Role of Government Affect Health Policies?	70
Is There a Right to Health Care?	71
How Does Public Health Balance the Rights of Individuals and the Needs of Society?	73
How Can Bioethical Principles Be Applied to Protecting Individuals Who Participate in Research?	74
Key Words	76
Discussion Questions	77
References	77
Section II: Cases and Discussion Questions	78
Section III Preventing Disease, Disability, and Death	83
Chapter 6 Non-Communicable Diseases	87
Learning Objectives	87
What Is the Burden of Non-Communicable Disease?	88
How Can Screening for Disease Address the Burden of Non-Communicable Diseases?	89
How Can Identification and Treatment of Multiple Risk Factors Be Used to Address the Burden of Non-Communicable Disease?	90
How Can Cost-Effective Interventions Help Us Address the Burden of Non-Communicable Diseases?	93
How Can Genetic Counseling and Intervention Be Used to Address the Burden of Chronic Diseases?	94
What Can We Do When Highly-Effective Interventions Don't Exist?	95

How Can We Combine Strategies to Address Complex Problems of Non-Communicable Diseases?	96
Key Words	97
Discussion Questions	98
References	98

Chapter 7 Communicable Diseases 99

Learning Objectives	99
What Is the Burden of Disease Caused by Communicable Diseases?	100
What Public Health Tools Are Available to Address the Burden of Communicable Diseases?	101
How Can Barriers Against Disease Be Used to Address the Burden of Communicable Diseases?	101
How Can Immunizations Be Used to Address the Burden of Communicable Diseases?	102
How Can Screening and Case Finding Be Used to Address the Burden of Communicable Disease?	102
How Can Treatment of Those Diagnosed and Their Contacts Help Address the Burden of Communicable Disease?	103
How Can Public Health Efforts Maximize Effectiveness of Treatment and Prevent Resistance?	103
How Can Public Health Strategies Be Used to Eliminate Specific Communicable Diseases?	103
What Options Are Available for the Control of HIV/AIDS?	105
What Options Are Available for the Control of Influenza?	107
What Options Are Available for the Control of Rabies?	108
Key Words	109
Discussion Questions	110
References	110

Chapter 8 Environmental Health and Safety 111

Learning Objectives	111
What Is Meant by “Environment”?	111
What Is the Burden of Disease Due to the Physical Environment?	112
How Does Risk Assessment Address the Impacts of the Physical Environment?	113
What Is a Public Health Assessment?	114
What Is an Ecological Risk Assessment?	115
What Is an Interaction Analysis Approach to Environmental Diseases?	118
What Is a Systems Analysis Approach to Environmental Health and Safety?	118
Key Words	120
Discussion Questions	121
References	121

Section III: Cases and Discussion Questions 122

Section IV Health Professionals, Healthcare Institutions, and Healthcare Systems	127
Chapter 9 Health Professionals and the Health Workforce	129
Learning Objectives	129
What Do We Mean by a Health Professional?	130
How Do Education and Training Serve to Define Health Professions?	130
What Is the Education and Training Process for Physicians?	130
What Is the Education and Training Process for Nursing?	131
What Is the Education and Training Process for Public Health Professionals?	131
What Is Meant by Primary, Secondary, and Tertiary Care?	136
How Are Clinical Health Professionals Rewarded and Compensated for Their Services?	136
How Can We Ensure the System Has the Right Number of Healthcare Professionals?	137
Key Words	139
Discussion Questions	140
References	140
Chapter 10 Healthcare Institutions	141
Learning Objectives	141
What Institutions Make Up the Healthcare System?	142
What Types of Inpatient Facilities Exist in the United States?	142
What Types of Outpatient Facilities Exist in the United States?	143
What Do We Mean By the Quality of Healthcare Services?	144
How Can Health Care Be Coordinated Among the Multiple Institutions that Provide Healthcare Services?	145
What Types of Coordination of Care Are Needed and What Purposes Do They Serve?	146
What Types of Healthcare Delivery Systems Are Being Developed and How Can They Help Ensure Coordination of Health Care?	146
How Can Electronic Medical Records Be Used to Facilitate Coordination of Care and Improve Quality?	147
How Is Technology Being Used to Improve the Quality of Care?	149
What Mechanisms Are Being Used to Monitor and Ensure the Quality of Health Care in the United States?	150
Can Disclosing Medical Errors Contribute to Quality of Care and Serve as an Alternative to Malpractice?	151
Key Words	152
Discussion Questions	153
References	153

Chapter 11 Healthcare Systems	155
Learning Objectives	155
How Much Money Does the United States Spend on Health Care?	156
What Types of Government-Supported Health Insurance Are Available?	156
What Types of Employment-Based Health Insurance Are Available?	158
What Are the Extent and Consequences of Being Uninsured and Underinsured in the United States?	160
How Can We Describe Healthcare Systems in General and the U.S. Healthcare System in Particular?	161
How Can We Describe the Healthcare Systems in Canada and the United Kingdom?	161
What Conclusions Can We Reach From These Descriptions of the U.S., Canadian, and U.K. Healthcare Systems?	161
How Can a Healthcare System Be Scored?	162
Using the National Scorecard, How Does the United States' Healthcare System Perform Compared to Those of Other Developed Countries?	163
How Can the Costs of Health Care Be Controlled in the United States?	164
Key Words	168
Discussion Questions	169
References	169
Section IV: Cases and Discussion Questions	170
 Section V Public Health Institutions and Systems	 175
 Chapter 12 Public Health Institutions and Systems	 177
Learning Objectives	177
What Are the Goals and Roles of Governmental Public Health Agencies?	177
What Are the Ten Essential Public Health Services?	178
What Are the Roles of Local and State Public Health Agencies?	178
What Are the Roles of Federal Public Health Agencies?	183
What Are the Roles of Global Health Organizations and Agencies?	183
How Can Public Health Agencies Work Together?	186
What Other Government Agencies Are Involved in Health Issues?	187
What Roles Do Nongovernmental Organizations Play in Public Health?	188
How Can Public Health Agencies Partner with Health Care to Improve the Response to Health Problems?	188
How Can Public Health Take the Lead in Mobilizing Community Partnerships to Identify and Solve Health Problems?	189
Key Words	191
Discussion Questions	192
References	192

Chapter 13 The Future of Population Health	193
Learning Objectives	193
What Is Public Health's Role in Addressing Outbreaks of Disease?	194
How Are Public Health Agencies Involved in Protecting Against Terrorism and Bioterrorism?	194
What Can We Learn from the Mistakes of the Past?	196
Avoid Implementing Interventions When Preparation Is Enough	196
Interventions Routinely Used on Large Numbers of People Need to Be Especially Safe	196
Control of a Disease Is Often Possible; Elimination Is Rarely Realistic	196
What Can We Learn from Past Trends?	196
What Is Systems Thinking and How Can It Improve Public Health Efforts?	199
How Can Systems-Thinking Approaches Be Applied to Food Safety?	202
How Can an Educated Citizenry Make the 21st Century Different for the Public's Health?	204
Key Words	204
Discussion Question	205
References	205
Section V: Cases and Discussion Questions	206
 Glossary	 209
Index	219



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Richard K. Riegelman, MD, MPH, PhD, is Professor of Epidemiology-Biostatistics, Medicine, and Health Policy, and founding dean of The George Washington University School of Public Health and Health Services in Washington,

DC. He has taken a lead role in developing the Educated Citizen and Public Health initiative which has brought together arts and sciences and public health education associations to implement the Institute of Medicine of the National Academies' recommendation that "...all undergraduates should have access to education in public health." Dr. Riegelman also led the development of George Washington's undergraduate public health major and minor and currently teaches "Public Health 101" and "Epidemiology 101" to undergraduates.



Dedication

To Nancy Alfred Persily, whose enthusiasm for teaching public health to undergraduates inspired *Public Health 101: Healthy People–Healthy Populations*.



Acknowledgments

Public Health 101: Healthy People–Healthy Populations is the culmination of a decade of effort aimed at introducing public health to undergraduates. The effort began with the teaching of an introductory course in public health in 1998 at the then newly created George Washington University School of Public Health and Health Services. The new course organized by Nancy Alfred Persily inspired my own efforts to teach and to learn from a new generation. The approach was designed as part of a liberal arts education stimulating the movement which came to be called The Educated Citizen and Public Health.

Efforts to think through the content of an introductory course in public health has involved a large number of people throughout the United States. Public health, arts and sciences, and clinical educators all participated in the 2006 Consensus Conference on Public Health Education which put forward the framework for “Public Health 101” upon which this book is based. Among those who led and continue to lead this effort is Susan Albertine whose insights into the relationship between public health and liberal education has formed the basis for much of The Educated Citizen and Public Health movement.

I have taught “Public Health 101” since 2002, providing an opportunity to teach and to learn from over 300 undergraduate students at The George Washington University. Their feedback and input has been central to writing and rewriting this book. Madison Hardee and Katie Harter deserve special recognition for their extensive feedback on many chapters of the book. Laura Olsen provided extremely valuable editing assistance. Paul Marantz from Albert Einstein School of Medicine utilized a draft of the book in teaching an introductory undergraduate course. His students also provided helpful feedback. I’d also like to thank Alan Greenberg and Dante Verme, the chair and vice chair of the Department of Epidemiology and Biostatistics at The George Washington University School of Public Health and Health Services, for their support of my efforts to expand the audience for undergraduate public health.

The draft of the text went through extensive review and feedback. I am grateful to all those who read chapters and provided constructive input. These include Doug Anderson, Constance Battle, Amanda Castel, James Cawley, Ellen Dawson, Diane Dewar, Mark Edberg, Leonard Friedman, Jaime Gofin, Michael Gough, Marc Hiller, Rebecca Katz, Ruth Long, Manya Magnus, David Michaels, Marjorie Rubenson, Richard Skolnik, Joel Teitelbaum, and Sara Wilensky.

Mike Brown, Publisher of public health books for Jones and Bartlett, has made an extraordinary contribution to this book and the series as a whole. His vision has helped craft the series and his publishing expertise made it happen. Catie Heverling, Tracey Chapman, Sophie Fleck, and Jessica Cormier of the editorial, production, and marketing staff of Jones and Bartlett deserve special recognition. Their commitment to this book and the entire *Essential Public Health* series has gone well beyond the expectations of their job. They have watched over this project to ensure that it meets the highest publishing standards and finds its role in the education of an entire generation of students new to public health. Sarah Hajduk’s copyediting helped improve the clarity and consistency of this text.

Last, but by no means least, is my wife, Linda Riegelman, who encouraged this book and the *Essential Public Health* series from the beginning. She saw the need to reach out to students and make real the roles that public health plays in their everyday lives. Linda went the extra mile by reading and rereading every word I wrote. She deserves the credit for what works but the blame for what fails is all mine.

Confronting the challenge of putting together *Public Health 101* has been one of the great joys of my professional life. I hope that it will bring both joy and a challenge to you as enter into the important and engaging world of public health.

Richard Riegelman, MD, MPH, PhD

April 2009

Washington, DC



Preface: What Is *Public Health 101* All About?

Health care is vital to all of us some of the time, but public health is vital to all of us all of the time.
—C. Everett Koop¹

Public health is about what makes us sick, what keeps us healthy, and what we can do TOGETHER about it. When we think about health, what often comes to mind first is individual health and wellness. In public health, what should come to mind first is the health of communities and society as a whole. Thus, in public health the focus shifts from the individual to the population, from me to us. Whether the issue is influenza, AIDS, climate change, or the cost of health care, we need to look at the impact on individuals and groups at risk as well as the population as a whole.

Public Health 101: Healthy People–Healthy Populations will introduce you to the population health approach to public health. Population health asks basic questions about what determines health and disease. It puts on the table the full range of options for intervention to promote health and prevent disease. These options can range from individualized medical care, to community-wide efforts to protect health and detect disease, to society-wide interventions ranging from laws to taxes.

Public Health 101 is divided into five sections:

- Section I—Principles of Population Health
- Section II—Tools of Population Health
- Section III—Preventing Disease, Disability, and Death
- Section IV—Health Professionals, Healthcare Institutions, and Healthcare Systems
- Section V—Public Health Institutions and Systems

Section I provides an overview of the principles of population health. We outline what determines disease and disability. We see how we can use evidence to come up with strategies for protecting health and reducing disease, disability, and death. In Chapter 1, we see how public health affects our daily life in ways that we often take for granted. We see how public health focuses on the needs of society as a whole, as well as the needs of populations with special vulnerabilities to disease and disability. We also explore the full range of potential interventions for protecting health and preventing disease, disability, and death. Chapter 2 demonstrates how population health places special emphasis on using evidence to define health problems; to understand the etiology or cause of disease; to develop recommendations for addressing health problems; and to implement and evaluate the benefits and harms of these interventions.

Section II examines the tools of population health designed to reach large numbers of people. These tools include: health information and communications; social and behavioral sciences; and health policy, law, and ethics. In Chapter 3, called Health

Informatics and Health Communications, we look at how health data is obtained and compiled and how it can be conveyed or communicated and used to make decisions. In Chapter 4, we look at the contributions of social sciences to our understanding of the sources of health and disease and the tools available to reduce disease, disability, and death. To do this, we examine how social, economic, and cultural factors affect health. We also examine how individual and group behavior can be changed to improve health. In Chapter 5, we take a look at how health policies and laws can be used to improve health. We also examine the legal, policy, and ethical limitations on their use.

Section III looks at the types of conditions that produce disability and death which include: non-communicable disease, communicable diseases, and environmental disease and injury. We explore the types of interventions that are available to protect health, and prevent disease, disability, and death for each of these types of conditions. Chapter 6 looks at a wide range of non-communicable diseases, including most cancers and diseases of the heart and blood vessels, as well as diseases that affect our mental health, from depression to Alzheimer's. We look at a range of options for intervention including: screening for risk factors and for early detection; genetic modification; and use of cost-effective treatments. Chapter 7 examines communicable diseases or diseases that can be transmitted from person-to-person or from other species to humans. It reviews the options for eliminating or controlling the impacts of these conditions. Options for intervention include: barriers to prevent spread of disease ranging from hand washing to quarantine; immunizations designed to protect individuals, as well as populations; and screening, case finding, and preventive treatment designed to cure and control disease. Chapter 8 explores the impact of the physical environment. We look at the health impacts of the unaltered or natural environment; the human-impacted or altered environment; and the impact of the physical environment built for human use including issues of injuries or safety. We explore the multiple ways that we interact with the physical environment and the resulting potential for disease and injury. We also explore approaches to reducing risk.

In Section IV, we step back and take a look from the population health perspective at health care and healthcare systems focused on the care of individuals one at a time. The healthcare system is such a large enterprise that it has consequences far beyond the individuals it directly serves. In Chapter 9, we examine the range of health professionals, including physicians, nurses, and public health professionals. We ask what we mean by a health professional and look at the roles that education and training play in that process. We also look at how society regulates and compensates health professionals. Chapter 10 examines the types of healthcare institutions in the United States, from hospitals to hospice. It examines how these organizations fit together to address issues of coordination and quality of health care. It asks what we can do to connect the components to ensure coordination and quality of care. In Chapter 11, we build upon what we have learned about healthcare professionals and healthcare institutions and examine the healthcare system as a whole. To do this, we need a basic understanding of how the healthcare system is financed and we look at the issue of access to care and the cost of health care. We examine choices you may need to make when selecting health insurance, as well as choices society as a whole needs to make to provide health care to everyone.

Finally, in Section V we look at the public health system, including the governmental structures that make public health *public*. We also ask basic questions about where we go from here as we explore the future of public health. Chapter 12 examines public health agencies at the local, state, federal, and global levels, and explores the roles that public health agencies are expected to play. It recognizes that even with close collaboration among agencies, the job of population health requires involvement of many other groups. We examine approaches to cooperation with other governmental agencies, nongovernmental organizations, and healthcare professionals. Chapter 13 concludes the book by asking you to think about the future of public health. We examine the emerging emphasis on protection of health through disaster preparation and response. We also see how we can plan for the future by learning lessons from the past and understanding current trends that are likely to continue.

How will we go about accomplishing all this? *Public Health 101: Healthy People–Healthy Populations* will not try to overload your mind with facts. It is about providing you with frameworks for thinking, and applying these frameworks to real situations and thought-provoking scenarios.

Each chapter begins and ends with scenarios designed to show you the types of situations you may confront. After each section, there are cases that relate to one or more chapters in the section. They provide realistic case studies and open-ended questions to help you think through the application of the key concepts presented in each section.

Public Health 101: Healthy People–Healthy Populations has been designed to fulfill the recommendations for “Public Health 101” developed as part of the faculty development program sponsored by the Association for Prevention Teaching and Research (APTR) and the Association of American Colleges and Universities (AAC&U) and funded by the Centers for Disease Control

and Prevention (CDC).² These recommendations include learning outcomes, as well as enduring understandings, designed to identify key concepts and frameworks that students should take away from “Public Health 101” and integrate into their thinking, their work, and their lifelong learning.

Public Health 101 is designed as a gateway to the world of public health. You should take advantage of the Public Health 101 Web site at www.publichealth101.org.

Hopefully, you will come away from reading *Public Health 101* with an appreciation of how the health of the public is influenced by and can be improved by efforts directed at the population, as well as at the individual level. Let us begin in Chapter 1 by exploring the ways that public health affects everyone’s daily life.

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About the Author

Richard Riegelman, MD, MPH, PhD, is Professor of Epidemiology–Biostatistics, Medicine, and Health Policy, and founding dean of The George Washington University School of Public Health and Health Services. His education includes an MD from the University of Wisconsin, plus a MPH and PhD in Epidemiology from The Johns Hopkins University. Dr. Riegelman practiced primary care internal medicine for over 20 years.

Dr. Riegelman has over 70 publications, including six books for students and practitioners of medicine and public health. He is currently editor of the Jones and Bartlett book series *Essential Public Health*. The series provides books and ancillary materials for the full spectrum of curricula for undergraduate public health education, as well as the core and crosscutting competencies covered by the Certification in Public Health examination of the National Board of Public Health Examiners.

Dr. Riegelman has spearheaded efforts to fulfill the Institute of Medicine's recommendation that "...all undergraduates should have access to education in public health." His work with national public health and arts and sciences organizations has developed into The Educated Citizen and Public Health Movement. This movement now includes efforts by the Association of Schools of Public Health (ASPH), the Association for Prevention Teaching and Research (APTR), the Association of American Colleges and Universities (AAC&U), and the American Public Health Association (APHA), to implement undergraduate public health education. Richard Riegelman teaches medical school, graduate, and undergraduate public health courses, which include "Public Health 101" and "Epidemiology 101."

