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Public Health 101 Healthy People–Healthy Populations

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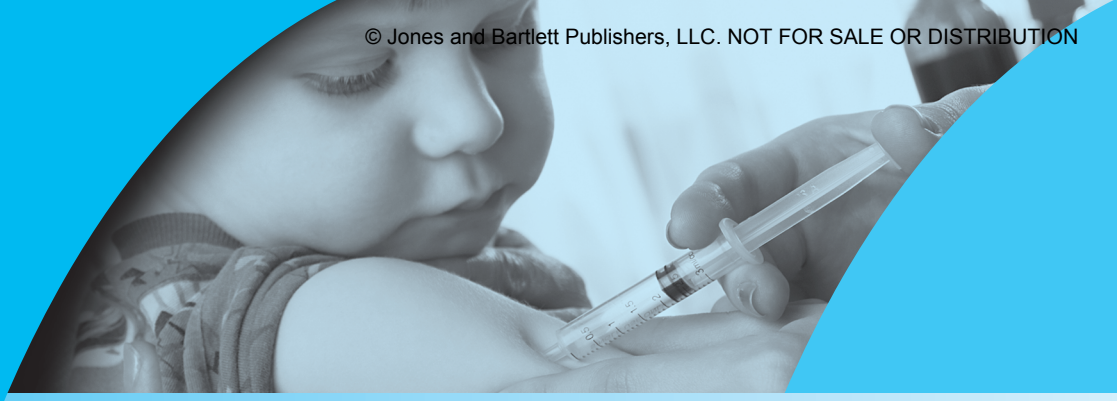

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Richard K. Riegelman, MD, MPH, PhD, is Professor of Epidemiology-Biostatistics, Medicine, and Health Policy, and founding dean of The George Washington University School of Public Health and Health Services in Washington,

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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.

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Dedication

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

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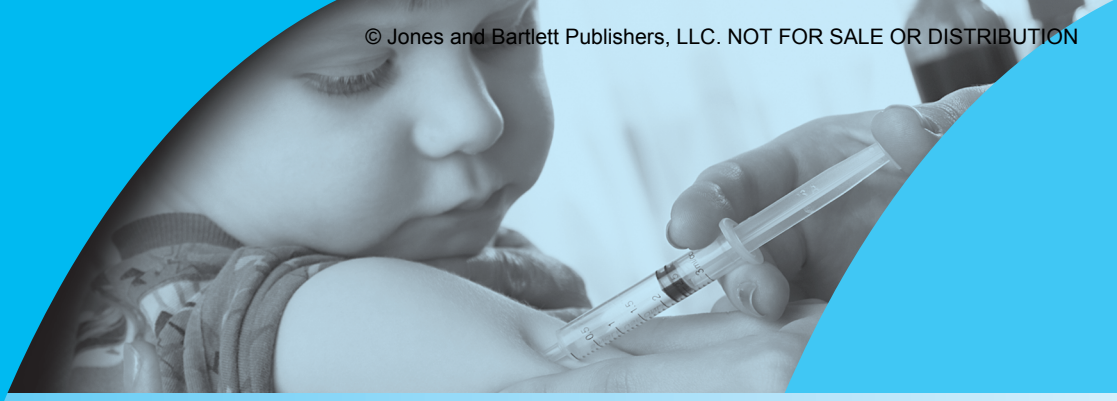

Acknowledgments

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.

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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

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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 Koop[1]

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

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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

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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."

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