



# Essentials of Public Health Preparedness

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# Prologue: Essentials of Public Health Preparedness

Public Health is no longer exclusively about promoting health and preventing disease; it is now about protecting health as well. From bioterrorism to environmental disasters and emerging communicable disease, threats to health now appear everywhere we look. *Essentials of Public Health Preparedness* takes an all-hazards approach to public health preparedness, providing broad perspectives on local, national, and global threats.

Professor Katz takes on the challenge of putting public health preparedness in the larger context of public health education and public policy. She brings to this challenge a wealth of background in the policy aspects of public health preparedness, having worked at the intersection of infectious diseases and national security for the Defense Intelligence Agency, the Joint Military Intelligence College, and the Department of State. Rebecca Katz builds on an exceptional education background at Swarthmore (BA), Yale (MPH), and Princeton (PhD).

*Essentials of Public Health Preparedness* focuses on public policy but does not stop there. Dr. Katz goes on to describe the operational aspects of public health preparedness. She reviews the experience of September 11, 2001 and the recommendations of the 9/11 Commission, exploring the framework and institutions being built on these recommendations. Once the reader has understood the basics, she turns her attention to solving problems. In doing this she develops in the reader an appreciation of the complexities of the issues that must be considered by public health professionals in designing

preparedness and response plans, policies, regulations, and legislation.

The text concludes with a look at what can be learned from recent experiences. Pandemic influenza and Hurricane Katrina represent two episodes that help illustrate the wide range of interventions and policies that are needed to protect health. They also illustrate the essential roles that the public health community plays in preparing for and responding to security threats.

*Essentials of Public Health Preparedness* assumes no prior background in public health preparedness, yet it speaks to the needs of undergraduate students, graduate students, and public health practitioners. Public health preparedness has become a cornerstone of public health and a major undertaking of governmental public health. Public health preparedness content is increasingly being integrated into public health education at the undergraduate, as well as graduate levels. New competencies are being developed by the Association of Schools of Public Health with support and encouragement from Centers for Disease Control and Prevention. *Essentials of Public Health Preparedness* will help students and practitioners fulfill these competencies.

I'm confident that you will find this book engaging and enlightening. I'm delighted that *Essentials of Public Health Preparedness* is now a part of our Essential Public Health series.

Richard Riegelman, MD, MPH, PhD  
Series Editor, *Essential Public Health*





# Preface

The last decade has seen many changes in terms of how we view our security and the role of the public health community. There is an ever-evolving threat of the terrorist use of weapons of mass destruction against our population, in particular the use of biological weapons. Infectious diseases continue to emerge and reemerge around the world, and the globalization of our food supply and the speed and volume of international travel make us all vulnerable to the emergence of a new agent anywhere in the world.

There is mounting evidence that large-scale epidemics can dramatically affect the economic, social, and security foundations of a nation. We are constantly reminded of the devastating effects of natural disasters, particularly hurricanes and earthquakes. All of these factors have led to the emergence of a new subdiscipline within public health—public health preparedness. The public health community plays a vital role in identifying, responding to, containing, and recovering from emergencies. It is imperative that public health professionals develop an awareness of the emerging threats, the means of addressing those threats, and the security challenges inherent in these activities and that they be able to identify and work with other sectors with similar responsibilities.

Public health preparedness is a new discipline, but it has been rapidly developing at the federal, state, and local levels. Academia is now acknowledging this as an essential area of expertise necessary for a fully developed public health workforce. The goal of this book is to introduce students to the field of public health preparedness. The book presupposes no previous exposure to the concepts, yet provides enough depth for students who may have advanced knowledge.

*Public Health Preparedness* is divided into four parts:

- Part I: Background of the Field
- Part II: Defining the Problem: Potential Threats
- Part III: Infrastructure
- Part IV: Solving Problems

Part I provides an overview and background to the field of public health preparedness. We look at how the field has evolved, as well as how different entities have defined the subdiscipline. We also review the definitions and evolution of national security and homeland security, with particular emphasis on how they relate to public health. Finally, we look at the role of the public health professional in emergency preparedness—from designing policy to participating in disaster response—and explore potential careers in the field.

Part II begins to characterize the problems that require preparedness on the part of the public health community. Chapter 2 covers threats from biological, chemical, nuclear, and radiological weapons. We define these threats and review the history of use—both intentional and accidental. The chapter then looks at how the current threat from weapons of mass destruction (WMDs) is evaluated and returns to the role of the public health community in responding to WMD. Chapter 3 discusses threats from naturally occurring disease and natural disasters: the historical impact of disease and natural disaster on homeland and national security, preparedness activities around the threat of naturally occurring diseases, evaluation of the current threat from disease and disasters, and the public health and foreign policy response to these threats.

Part III moves from definitions and threat characterization to a review of the infrastructure, primarily on the federal level, that has emerged in the past decade to address public health preparedness. Chapter 4 focuses on the immediate response to September 11, 2001, and the 9/11 Commission findings. We review the National Strategy for Homeland Security and the offices and organizations that were created in the aftermath of 9/11. This chapter also introduces the reader to the intelligence community. Chapter 5 presents the preparedness plans that were created in response to evolving threats. We look at the National Response Framework—with particular emphasis on public health and medical response components, the National Incident Management System, and specific plans for public health emergencies. Finally, Chapter 6 presents the legislation, regulations, and policy guidance that have emerged to address public health preparedness and to mitigate the threats of WMD, naturally occurring disease, and other disasters.

Part IV of the book is generally concerned with solving problems, and it includes a variety of approaches the community has taken to address biological threats, along with the challenges of each approach. Chapter 7 explores biosecurity: defining the dual-use dilemma, determining how biosecurity is used to minimize the threat, examining the role of the life sciences community in establishing codes of conduct and self-policing scientific publications, reviewing pathogen security efforts, and examining synthetic biology as a threat to security. In Chapter 8, we look at the research agenda and which agencies are engaged in supporting basic scientific research that directly relates to biological threats. We also look at the enterprise that has been built to support the development of medical countermeasures and at the proliferation of biosafety level 3 and level 4 laboratories.

Chapter 9 focuses on the role of treaties in prevention of WMD and how international agreements have been used to address public health threats. Chapter 10 concentrates on the challenges associated with investigating an alleged use event and on making an attribution assessment. We explain microbial forensics, present the case study of a domestic investigation of alleged biological weapons use, and discuss the international mechanisms available for investigating suspected chemical and biological weapons use. This chapter also explores the relationship between the Federal Bureau of Investigation and the public health community, particularly as it pertains to criminal and epidemiological investigations.

In Chapter 11, we turn our attention to biosurveillance and discuss the domestic and international surveillance programs, as well as the federal entities, tasked with and engaged in these efforts. Chapter 12 provides several case studies of public health preparedness and response. We look at preparedness activities around avian influenza (H5N1); response activities around pandemic influenza (H1N1); and response mechanisms for natural disasters, including Hurricane Katrina and the Haiti earthquake. The final chapter, Chapter 13, takes the reader from the local preparedness level to global governance of disease. This chapter looks at the role of local preparedness activities, quarantine as part of preparedness and response, and global governance as it pertains to infectious diseases and public health emergencies of international concern.

This book is designed to give the reader an appreciation of the complexity of issues that must be considered by public health professionals in designing preparedness and response plans, policies, regulations, and legislation. I hope readers will better understand the essential role of the public health community in preparing for and responding to security threats.



# Acknowledgments

This book is based on a class I teach at The George Washington University School of Public Health and Health Services—a class I inherited in 2006 from Brian Kamoie. So I first thank Brian for his foresight and efforts in designing this class and for trusting me to build on the foundation he provided. I thank the class for their helpful comments on earlier drafts

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# About the Author

**Rebecca Katz, PhD, MPH**, is an assistant professor of health policy and emergency medicine at The George Washington University School of Public Health and Health Services. Her research is focused on public health preparedness and the interface between infectious diseases and national security. Since 2007, the primary focus of her research has been on the domestic and global implementation of the Revised International Health Regulations. She previously worked on biological warfare counterproliferation at the Defense Intelligence Agency, was an Intelligence Research Fellow at the Center for Strategic Intelligence Research in the Joint Military In-

telligence College, and spent several years as a public health consultant for The Lewin Group. Since 2004, Dr. Katz has been a consultant to the Department of State, working on issues related to the Biological Weapons Convention, avian and pandemic influenza, and disease surveillance. She is the co-editor of the 2nd edition of the *Encyclopedia of Bioterrorism Defense*, and author or co-author of more than 30 papers, book chapters, and policy briefs. Dr. Katz received her undergraduate degree in political science and economics from Swarthmore College, an MPH from Yale University, and a PhD in public affairs from Princeton University.







# Abbreviations

AI	avian influenza	CREATE	Center for Risk and Economic Analysis of Terrorism Events
ALERT	Center of Excellence for Awareness and Location of Explosives—Related Threats	CRI	Cities Readiness Initiative
APHIS	Animal and Plant Health Inspection Service	CS	chlorobenzylidenemalononitrile
ARS	acute radiation syndrome	CTR	Cooperative Threat Reduction
ASPH	Association of Schools of Public Health	CW	chemical warfare/chemical weapons
ASPR	Assistant Secretary for Preparedness and Response	CWC	Chemical Weapons Convention
BARDA	Biomedical Advanced Research and Development Authority	CWS	Chemical Warfare Service
BEP	Biological Engagement Program	DEA	Drug Enforcement Agency
BSL	biosafety level	DHHS	Department of Health and Human Services
BT	bioterrorism	DHS	Department of Homeland Security
BW	biological warfare/biological weapons	DIA	Defense Intelligence Agency
BWC	Biological and Toxin Weapons Convention	DMAT	Disaster Medical Assistance Team
C2I	Center of Excellence in Command, Control and Interoperability	DNI	Director of National Intelligence
CAMRA	Center for Advancing Microbial Risk Assessment	DoD	Department of Defense
CBRN	chemical, biological, radiological, and nuclear	DOS	Department of State
CBRNE	chemical, biological, radiological, nuclear, and explosive	DTRA	Defense Threat Reduction Agency
CDC	Centers for Disease Control and Prevention	EEE	Eastern Equine Encephalitis
CIA	Central Intelligence Agency	EIS	Epidemic Intelligence Service
CN	chloroacetophenone	EO	Executive Order
COE	Centers of Excellence	ESF	Emergency Support Function
CONUS	Continental United States	FAA	Federal Aviation Administration
		FAZD	National Center for Foreign Animal and Zoonotic Disease Defense
		FBI	Federal Bureau of Investigation
		FDA	Food and Drug Administration
		FEMA	Federal Emergency Management Agency

FSU	Former Soviet Union	NIMS	National Incident Management System
GDD	Global Disease Detection	NIEHS	National Institute of Environmental Health Sciences
GOARN	Global Outbreak Alert and Response Network	NINDS	National Institute of Neurological Disorders and Stroke
HSEEP	Homeland Security Exercise and Evaluation Program	NIU	National Intelligence University
HSPD	Homeland Security Presidential Directive	NORAD	North American Aerospace Defense Command
HUMINT	human intelligence	NORTHCOM	Northern Command
IA	Office of Intelligence and Analysis (DHS)	NPS	National Pharmaceutical Stockpile
IAEA	International Atomic Energy Agency	NRF	National Response Framework
IARPA	Intelligence Advanced Research Projects Activity	NRO	National Reconnaissance Office
IBC	Institutional Biosafety Committee	NRP	National Response Plan
IC	intelligence community	NSA	National Security Agency
IHR	International Health Regulations	NSABB	National Science Advisory Board for Biosecurity
IO	international organization	NSD	National Security Directive
IOM	Institute of Medicine	NSDD	National Security Decision Directive
IMINT	imagery intelligence	NSPD	National Security Presidential Directive
INR	Bureau of Intelligence and Research (DOS)	NTSCOE	National Transportation Security Center of Excellence
IRF	Integrated Research Facility	OSINT	Open Source Intelligence
MASINT	Measurement and Signature Intelligence	OSTP	Office of Science and Technology Policy
MDR-TB	multiple-drug-resistant tuberculosis	OTA	Office of Technology Assessment
MIC	methyl isocyanate	PACER	National Center of the Study for Preparedness and Catastrophic Event Response
MPH	Masters in Public Health	PAHPA	Pandemic and All-Hazards Preparedness Act
MSEHPA	Model State Emergency Health Powers Act	PDD	Presidential Decision Directive
NAS	National Academies of Science	PEPFAR	U.S. President's Emergency Plan for AIDS Relief
NBACC	National Biodefense Analysis and Countermeasure Center	PHEIC	Public Health Emergency of International Concern
NBIC	National Biosurveillance Integration Center	PHEMCE	Public Health Emergency Medical Countermeasures Enterprise
NCFPT	National Center for Food Protection and Defense	PHS	Public Health Service
NCI	National Cancer Institute	PNAS	Proceedings of the National Academy of Sciences
NCIX	National Counterintelligence Executive	PPD	Presidential Policy Directive
NCPC	National Counterproliferation Center	PREP	Public Readiness and Emergency Preparedness Act
NCTC	National Counterterrorism Center	PS	chloropicrin
NDMS	National Disaster Medical System	RCE	Regional Center of Excellence [for biodefense and emerging infectious diseases]
NGA	National Geospatial-Intelligence Agency	SARS	severe acute respiratory syndrome
NGO	nongovernmental organization	SEPA	Smallpox Emergency Personnel Protection Act
NHSS	National Health Security Strategy		
NIAID	National Institute of Allergy and Infectious Diseases		
NIC	National Intelligence Council		
NIC	National Integration Center		
NIH	National Institutes of Health		

SIGINT	Signals Intelligence	USC	United States Code
SNS	Strategic National Stockpile	USDA	U.S. Department of Agriculture
SSC	Special Security Center	USPS	U.S. Postal Service
START	National Consortium for the Study of Terrorism and Responses to Terrorism	UTL	universal task list
T2	trichothecene mycotoxin	UTMB	University of Texas Medical Branch
TB	tuberculosis	VEE	Venezuelan Equine Encephalitis
TCL	Target Capabilities List	WEE	Western Equine Encephalitis
TECHINT	Technical Intelligence	WHA	World Health Assembly
UNSCR	United Nations Security Council Resolution	WHO	World Health Organization
UNSGM	United Nations Secretary General's Mechanism	WMD	weapon of mass destruction
USAID	United States Agency for International Development	WRS	War Research Service
USAMRIID	U.S. Army Medical Research Institute for Infectious Diseases	WWI	World War I
USA PATRIOT	Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism	WWII	World War II
		XDR-TB	extremely drug-resistant tuberculosis

