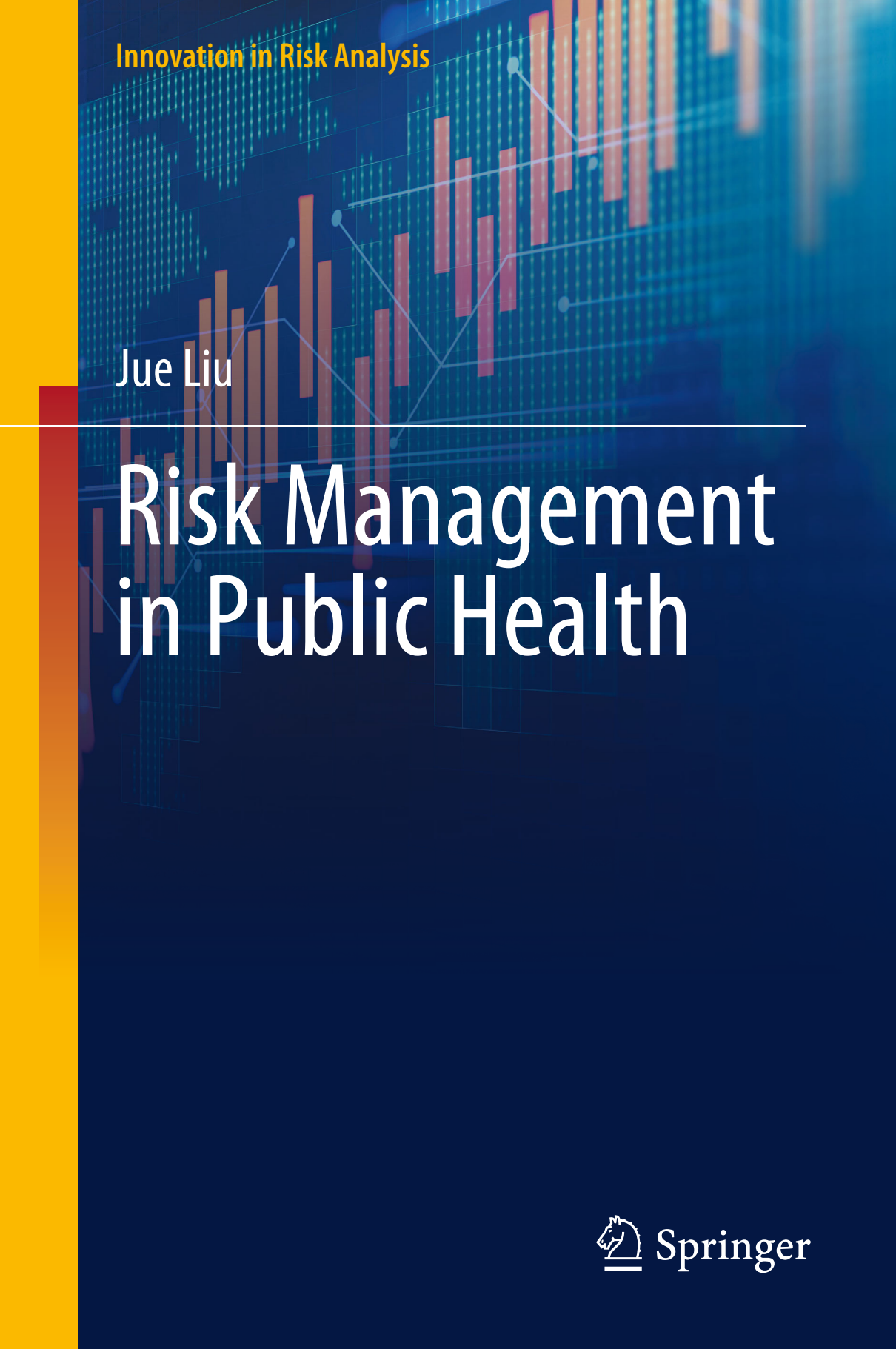
Innovation in Risk Analysis
Jue Liu
Risk Management in Public Health
Springer

Innovation in Risk Analysis

Series Editor

Jianping Li, School of Economics and Management, University of Chinese Academy of Science, Beijing, China

This book series focuses on discussing the new theories, new models, and new methods of risk analysis. Moreover, the better risk management practices in the areas of social, physical and health sciences, engineering, public policy and administration, and media and communication studies will priority attention.

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Jue Liu

Risk Management in Public Health

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Jue Liu
School of Public Health
Peking University
Beijing, China

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Preface

Public health risk management is an interdisciplinary science that involves a number of fields, including epidemiology, statistics, public policy and social science. With the acceleration of globalization, environmental changes and increased mobility of populations, the risks of public health have become increasingly complex and diverse. In recent years, global epidemics of emerging infectious diseases, such as COVID-19 and mpox, as well as the continuing threat of other infectious diseases, such as malaria and viral hepatitis, have further emphasized the importance of effective public health risk management.

In modern society, public health risk management is not only the responsibility of governments and health organizations, but also a task shared by society as a whole. Globalization has accelerated the spread of diseases, and health problems in a single country or region may rapidly evolve into a global health crisis. Therefore, international cooperation and information sharing have become particularly critical in public health risk management. The World Health Organization (WHO) and national governments play an indispensable role in responding to emerging and re-emerging infectious diseases and in developing public health strategies and contingency plans. In addition, public health risk management is not only about responding to emergencies, but also about managing long-standing health threats. It requires us to strengthen the construction of disease surveillance, risk assessment and early warning systems in our daily work, and to improve our capacity of early detection and rapid response to diseases. It is also required to develop and improve public health policies and regulations to ensure that risk management is scientific and standardized.

Advances in science and technology have greatly promoted the innovative development and practice of public health risk management. Taking advantage of the theoretical background and practical research experience in the field of public health risk management, the editor-in-chief of this book has organized a group of young experts, combined with domestic and international research advances, to write *Risk Management in Public Health*, aiming to provide a systematic framework for public health risk management, and to provide readers with a comprehensive demonstration, from theory to practice, of how to effectively identify, analyze, assess and respond to various public health risks.

The book is divided into two parts. Part I is "*Theories of Risk Management in Public Health*", which covers the basic concepts of public health risk, theories and approaches of risk assessment, surveillance and early warning systems, as well as theories and approaches of risk assessment of infectious diseases, public health emergency management, risk management and decision-making. Part II is "*Practices of Risk Management in Public Health*", which takes major infectious diseases in the world for example, such as COVID-19, mpox, malaria and viral hepatitis, and describes in detail specific cases of risk management practices in terms of disease burden, risk assessment, surveillance and early-warning, prevention and control strategies, and effect evaluation.

Through a systematic theoretical introduction and detailed practical examples, we hope to help readers fully understand and master the basic theories, methods and practical applications of public health risk management. Whether you are a public health professional, a policymaker or a researcher, we hope that this book can be a bright light for you in the field of public health risk management, and lead you to move forward on the road of promoting public health. We also extend our gratitude to the National Natural Science Foundation of China (Grant No. 72122001) for their support, which has made this work possible.

Beijing, China Jue Liu
May 2024

Contents

Abbreviations

AFP	Acute flaccid paralysis
Ag	Antigen
AHP	Analytic hierarchy process
AIDS	Acquired immunodeficiency syndrome
ALT	Alanine aminotransferase
anti-HAV	Antibody against hepatitis A virus
anti-HBc	Antibody against hepatitis B core antigen
anti-HCV	Antibody against hepatitis C virus
anti-HEV	Antibody against hepatitis E virus
AWD	Acute watery diarrhea
BRFSS	Behavior risk factors surveillance system
CDC	Centers for diseases control and prevention
COVID-19	Coronavirus disease 2019
DHIS2	District health information software version 2
DR Congo	Democratic Republic of the Congo
ECDC	European center for disease prevention and control
eDEWS	Electronic disease early warning system
EDM	Emergency decision-making
EOC	Emergency operations center
ERF	Emergency response framework
EWAR	Early warning alert and response
EWRS	European early warning and response system
FPT	Federal/provincial/territorial
GDP	Gross domestic product
GIS	Geographic information system
GTS	Global technical strategy for malaria 2016 – 2030
HAV	Hepatitis A virus
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus

HDV	Hepatitis D virus
HEV	Hepatitis E virus
HIV	Human immunodeficiency virus
IAR	Infected averted ratio
ICER	Incremental cost-effectiveness ratio
Ig	Immunoglobulin
IHR	International health regulations
ILI	Influenza-like illness
IMS	Incident management system
IPTp	Intermittent preventive treatment for pregnant women
IPTsc	Intermittent preventive treatment for school-aged children
IRS	Indoor residual spraying
IRV	Infectivity - receptivity – vulnerability
ISO	The international organization for standardization
ITNs	Insecticide-treated nets
MDA	Mass drug administrations
MDR-TB	Multidrug-resistant TB
MERS	Middle east respiratory syndrome
MONICA	Monitoring of trends and determinants in cardiovascular disease
MSM	Men who make sex with men
NCI	National cancer institute
NHS	National health service
NRC	National research council
PDMC	Post-discharge malaria chemoprevention
PHEIC	Public health emergency of international concern
PHEMLS	Public health emergency management legal system
PMC	Perennial malaria chemoprevention
RNA	Ribonucleic acid
RR-TB	Rifampicin-resistant TB
SARS	Severe acute respiratory syndrome
SDGs	Sustainable development goals
SEIR	Susceptible exposed infected recovered
SI	Susceptible infected
SIR	Susceptible infected recovered
SIRS	Susceptible infected recovered susceptible
SMC	Seasonal malaria chemoprevention
STD	Sexually transmitted disease
TB	Tuberculosis
UHC	Universal health coverage
UI	Uncertain interval
UN	United nations
WHO	World health organization

List of Figures