

One Health

The Theory and Practice of Integrated Health Approaches

Edited by
Jakob Zinsstag
Esther Schelling
David Waltner-Toews
Maxine Whittaker
Marcel Tanner



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Contents

Contributors	ix
Editors' Preface	xv
FAO Foreword	xvii
OIE Foreword	xix
WHO Foreword	xxi
 PART 1: THEORETICAL FOUNDATIONS	
1 One Health in History	1
<i>Michael Bresalier, Angela Cassidy and Abigail Woods</i>	
2 Theoretical Issues of One Health	16
<i>Jakob Zinsstag, David Waltner-Toews and Marcel Tanner</i>	
3 The Human–Animal Relationship in the Law	26
<i>Lenke Wettlaufer, Felix Hafner and Jakob Zinsstag</i>	
4 One Health: an Ecological and Conservation Perspective	38
<i>David H.M. Cumming and Graeme S. Cumming</i>	
 PART 2: METHODS FOR THE ASSESSMENT OF THE ANIMAL–HUMAN LINKAGES	
5 Measuring Added Value from Integrated Methods	53
<i>Jakob Zinsstag, Mahamat Béchir Mahamat and Esther Schelling</i>	
6 The Role of Social Sciences in One Health – Reciprocal Benefits	60
<i>Maxine Whittaker</i>	
7 The Role of Human–Animal Interactions in Education	73
<i>Karin Hediger and Andrea Beetz</i>	

8	Integrated Risk Assessment – Foodborne Diseases	85
	<i>Vanessa Racloz, David Waltner-Toews and Katharina D.C. Stärk</i>	
9	A One Health Perspective for Integrated Human and Animal Sanitation and Nutrient Recycling	96
	<i>Hung Nguyen-Viet, Phuc Pham-Duc, Vi Nguyen, Marcel Tanner, Peter Odermatt, Tu Vu-Van, Hoang Van Minh, Christian Zurbrügg, Esther Schelling and Jakob Zinsstag</i>	
10	One Health Study Designs	107
	<i>Esther Schelling and Jan Hattendorf</i>	
11	Animal–Human Transmission Models	122
	<i>Jakob Zinsstag, Samuel Fuhrmann, Jan Hattendorf and Nakul Chitnis</i>	
12	One Health Economics	134
	<i>Jakob Zinsstag, Adnan Choudhury, Felix Roth and Alexandra Shaw</i>	
13	Integrated Human and Animal Demographic Surveillance	146
	<i>Vreni Jean-Richard and Lisa Crump</i>	
PART 3: CASE STUDIES FROM RESEARCH TO POLICY AND PRACTICE		
14	Brucellosis Surveillance and Control: a Case for One Health	153
	<i>Jakob Zinsstag, Anna Dean, Zolzaya Baljinnyam, Felix Roth, Joldoshbek Kasymbekov and Esther Schelling</i>	
15	Bovine Tuberculosis at the Human–Livestock–Wildlife Interface in Sub-Saharan Africa	163
	<i>Rea Tschopp</i>	
16	Integrated Rabies Control	176
	<i>Monique Léchenne, Mary Elizabeth Miranda and Jakob Zinsstag</i>	
17	Leptospirosis: Development of a National One Health Control Programme in Fiji	190
	<i>Simon Reid and Mike Kama</i>	
18	Human and Animal African Trypanosomiasis	201
	<i>Susan C. Welburn and Paul Coleman</i>	
19	Non-communicable Diseases: How Can Companion Animals Help in Connection with Coronary Heart Disease, Obesity, Diabetes and Depression?	222
	<i>Dennis C. Turner</i>	
20	Integrated One Health Services	230
	<i>Esther Schelling, Mahamat Béchir Mahamat, Jakob Zinsstag and Marcel Tanner</i>	
21	Beyond Fences: Wildlife, Livestock and Land Use in Southern Africa	243
	<i>David H.M. Cumming, Steven A. Osofsky, Shirley J. Atkinson and Mark W. Atkinson</i>	
22	Better Together: Identifying the Benefits of a Closer Integration Between Plant Health, Agriculture and One Health	258
	<i>Eric Boa, Solveig Danielsen and Sophie Haesen</i>	

23	Food Security, Nutrition and the One Health Nexus	272
	<i>Mahamat Béchir Mahamat, Lisa Crump, Abdessalam Tidjani, Fabienne Jaeger, Abderahim Ibrahim and Bassirou Bonfoh</i>	
24	One Health into Action: Integrating Global Health Governance with National Priorities in a Globalized World	283
	<i>Anna Okello, Alain Vandersmissen and Susan C. Welburn</i>	
25	One Health in Policy Development: an Integrated Approach to Translating Science into Policy	304
	<i>Susan C. Cork, Dorothy W. Geale and David C. Hall</i>	
PART 4: CAPACITY BUILDING, PUBLIC ENGAGEMENT AND CONCEPTUAL OUTLOOK		
26	Evolution of the One Health Movement in the USA	318
	<i>Carol S. Rubin, Rebekah Kunkel, Cheri Grigg and Lonnie King</i>	
27	Institutional Research Capacity Development for Integrated Approaches in Developing Countries: an Example from Vietnam	332
	<i>Hung Nguyen-Viet, Vi Nguyen, Phuc Pham-Duc, Le Vu Anh, Phung Dac Cam, Marcel Tanner, Delia Grace, Christian Zurbügg, Tran Thi Tuyet Hanh, Tu Vu-Van, Luu Quoc Toan, Dang Xuan Sinh, Pham Thi Huong Giang and Jakob Zinsstag</i>	
28	Enabling Academic One Health Environments	341
	<i>Bonnie Buntain, Lisa Allen-Scott, Michelle North, Melanie Rock and Jennifer Hatfield</i>	
29	Individual and Institutional Capacity Building in Global Health Research in Africa	357
	<i>Bassirou Bonfoh, Mahamat Béchir Mahamat, Esther Schelling, Karim Ouattara, Aurélie Cailleau, Daniel Haydon, Sarah Cleaveland, Jakob Zinsstag and Marcel Tanner</i>	
30	Transdisciplinary Research and One Health	366
	<i>Esther Schelling and Jakob Zinsstag</i>	
31	Operationalizing One Health for Local Governance	374
	<i>Andrea Meisser and Anne Lévy Goldblum</i>	
32	Non-governmental Organizations in One Health	385
	<i>Craig Stephen and David Waltner-Toews</i>	
33	Toward a Healthy Concept of Health	397
	<i>Karen L.F. Houle, with contributions by Karin Tschanz Cooke</i>	
34	Grappling with Complexity: the Context for One Health and the Ecohealth Approach	415
	<i>Martin J. Bunch and David Waltner-Toews</i>	
35	Summary and Outlook of Practical Use of One Health	427
	<i>Jakob Zinsstag and Marcel Tanner</i>	
	Index	435

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Editors' Preface

Since the late 1990s, One Health has become a unifying concept for a wide variety of governmental and non-governmental organizations concerned with human and animal health, wildlife conservation and environmental sustainability. In the wake of the avian influenza pandemic threat, the World Health Organization (WHO), the Food and Agriculture Organization (FAO) and the World Organisation for Animal Health (OIE) joined forces in what is called the 'Tripartite' engagement at the human–animal–ecosystem interface. One Health has become the lead concept in research, capacity building and translational consortia such as the EU-funded Integrated Control of Neglected Zoonoses (ICONZ) and the Training of the One Health Next Generation (OH-NEXTGEN) as well as the Wellcome Trust-funded Afrique One consortium.

We understand One Health foremost as any added value in terms of better health and well-being for humans and animals, financial savings and improved environmental services achieved from closer cooperation between practitioners and scholars concerned with human health, animal health and related outcomes, beyond what can be achieved by working alone. This operational statement shows the need for underlying theory, practical methods and case examples.

What is the added value of another book? Our experiences in Africa, Central Asia, North America, Asia, the Pacific and Australia/New Zealand show that human and animal health professionals remain in their specific silos despite encouraging improvements. We are always surprised how little the different disciplines know about each other and how little they communicate among and between each other.

Beyond merely research, One Health should translate into policy and practice for the betterment of health of communities, their animals and the integrity of their environment. The relationship between theory, policy and practice is a recursive one. Implementing One Health activities in different cultures can lead us to question some of our fundamental ideas about what constitutes good health, which then changes how we practise, which leads to further questioning. In order to learn from our experience in this process and to keep these ideas relevant in chaotic times and diverse settings, it is important to examine more explicitly both ourselves and the central ideas on which the programmes we promote are based. We hope this book both informs its readers and stretches us to reflect and learn from our personal experiences of One Health, as well as those of the people, animals and environments with which we work.

The present interdisciplinary textbook is based on more than a decade of experiences of research and translational teams and provides a comprehensive but minimal essential overview

on One Health theory and practice. It is intended for all those working for the health of communities in research and implementation, who see the need in their daily activities to liaise with other disciplines and sectors. This involves among others, human and animal health, social and cultural sciences, economics, environmental sciences and engineering and conservation. The book will benefit students in human and veterinary medicine, health and environmental sciences and biology to ground them in modern inter- and transdisciplinary methods. The book should also serve professionals in academia, technical authorities and government with its numerous practical examples and case studies on disease control, service provision, conservation and academic teaching.

The making of this book would not have been possible without the dedicated coordination of Dr Lisa Crump, whose tireless support is gratefully acknowledged. We would like to thank all lead authors and co-authors for their important contributions and hope that they will benefit from the book for their own work. Numerous external reviewers are thanked for their critical comments which greatly helped to improve the content of the book. We thank Bolor Bold, Sophie Haesen, Monique Léchenne, Rose Marie Subasic and Kurt Pfister for their support with copy-editing. Dr Borna Müller graciously contributed numerous graphical representations and figures. We would like to thank Rachel Cutts and Alexandra Lainsbury from CABI for their most helpful support.

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FAO Foreword

The One Health concept, or approach, is far from new, but its rediscovery is most welcome. Hippocrates (460–370 BCE) purportedly stated ‘The soul is the same in all living creatures, although the body of each is different’, recognizing that at the time, the soul had a more encompassing definition than we give today with regard to intellectual, emotional intensity or energy.

Such great thinkers as Rudolf Virchow, Robert Koch, Louis Pasteur, Aldo Leopold, Rachel Carlson, Pedro Acha and Calvin Schwabe contributed to our growing understanding of humans within their environment, the cause and effect and interrelationships between microbes, pathogens, contaminants, health and disease in a biotic and abiotic realm. While most human diseases that have emerged in the last half a century can be traced to an animal source, mostly coming from wildlife, and are often the focus for One Health discussions, non-zoonotic diseases cannot be excluded from the One Health dialogue. Animal diseases – in their entirety – limit efficiencies in production and erode biodiversity. They affect public health in terms of lower availability of quality nutritious products of animal origin and negatively influence the cognitive development of children, the responsiveness of the immune system and maternal health. In addition, these diseases negatively impact livelihoods, community trade and individual and national wealth.

Undoubtedly, addressing and attaining global health is a complex endeavour. It requires more than physicians and veterinarians collaborating to address individual or communal health. The disease drivers to emergence, maintenance and spread, dynamically revolve around factors and trends in population growth, demand for more dietary protein, widespread poverty, access to goods and services from the private and public sectors, growing trade and globalization. They further include environmental encroachment and natural resource degradation, immigration and peri-urban sprawl, political and social instability and economics. To address disease prevention at the root, classic non-health discipline specialists such as economists, sociologists, wildlife biologists, communication specialists, city and global planners and financiers have much to contribute.

The Food and Agriculture Organization (FAO) brings together top leaders in economic and social development, forestry and natural resources managers, environmental scientists, specialists in aquaculture and fisheries, nutritionists and geneticists, crop production specialists and pathologists, statisticians, veterinary public health and infectious disease experts from more than 194 countries for the purpose of eliminating hunger and poverty. The production of quality and nutritious food in a resilient environment is the cornerstone to health. Without health, we and our partners will not eliminate hunger or poverty. FAO, thus, is a One Health organization.

Throughout this book numerous cases studies show that the operationalization of One Health is possible and indicators of its positive impact in health terms crystalize at the local level. International institutions such as the FAO, the World Organisation for Animal Health and the World Health Organization recognize their joint responsibility and have established common platforms to address critical issues such as antimicrobial resistance or pandemic threats. Elements for furthering the impact of the One Health approach remain elusive and will need to develop national and regional bodies to embrace the required collaborative, multisectoral and transdisciplinary approach. This book provides a valuable resource for the theoretical background, novel methods and practical examples on One Health and will be a valuable reference for all.

Juan Lubroth

Food and Agriculture Organization of the United Nations

OIE Foreword

One Health seeks incremental benefits from closer cooperation of public and animal health. Such approaches have gained significant momentum in the past decades at the level of the international organizations, national governments, technical authorities and academia. From the perspective of the World Organisation of Animal Health (OIE), I particularly welcome this textbook providing a theoretical foundation, genuine One Health methods, numerous practical examples on disease control and experiences from local and national policy and academic curricula.

As a common theme the book seeks to demonstrate added value of collaborative approaches in human and animal health, social and environmental sciences and economics. After a historical overview, theoretical foundations of One Health provide a framework for the development of interconnected methods measuring quantitative and qualitative benefits using many different disciplines ranging from mathematics to molecular biology and the social sciences. One Health challenges the legal aspects of the human–animal relationship, eliciting new thinking on an intrinsic value of animals. The book documents the important role of wildlife conservation on the development of One Health by the formulation of the Manhattan principles. It suggests that sustainable conservation of wildlife requires healthy humans and animals surrounding protection areas. The social and educational sciences contribute and benefit from One Health shedding light on the human–animal bond and its ramifications far beyond infectious diseases.

One Health becomes a key approach for risk assessment and food safety. Population growth and the livestock revolution warrant novel ideas for environmental sanitation, which are addressed with examples from South-east Asia. The book shows further how health and demographic surveillance of human populations can be extended to livestock, which makes a lot of sense for pastoralist populations worldwide.

Joint animal and human health approaches for the control of zoonotic diseases like brucellosis, bovine tuberculosis, rabies, leptospirosis and trypanosomiasis provide key examples for One Health. They are complemented by a particularly compelling story on joint human and animal vaccination services to mobile pastoralists in Chad. It is based on the observation that in the pastoralist area of Lake Chad there were more cattle vaccinated than children. Several chapters show that One Health is not only applicable in developing countries but has a high potential for industrial and transition countries to address non-communicable diseases or antimicrobial resistance surveillance.

One Health academic studies provide the basis for policy and practice with examples from New Zealand, the Fiji Islands, the USA and Canada. The last part of the book outlines efforts and enabling environment for capacity building, such as joint appointments between veterinary and medical faculties and the development of new One Health research groups in Asia and Africa.

In the past decade, OIE adopted a leadership role early on and has been instrumental in putting the One Health vision into practice. This has been facilitated by a formal alliance on this topic with the World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations (FAO). The three organizations have published a joint Concept Note clarifying their reciprocal responsibilities and their objectives in this field.

The OIE publishes international standards on the good governance of both the public and private sector components of veterinary services, including the initial training and continuing education of the various actors involved. Furthermore, if an OIE member country so wishes, the OIE can carry out an independent assessment of their veterinary services' compliance with OIE quality standards using the Performance of Veterinary Services (PVS) Evaluation Tool. It can also carry out further assessments that enable member countries to calculate the investments and legislative and technical reforms needed to bring their veterinary services into line with these quality standards.

These assessments, which are known collectively as the OIE 'PVS Pathway', have already benefited nearly 120 member countries. As part of the Pathway, the OIE is piloting an assessment tool that evaluates the One Health component of veterinary services; this tool has already been successfully tested in three countries. It is designed to help countries to establish closer collaboration between veterinary services and public health services, in compliance both with the quality standards of the OIE and with the International Health Regulations (IHR) of the WHO. The recent decision of the WHO to develop a tool similar to the PVS Evaluation Tool to assist its member countries to assess their compliance with the IHR (and estimate the costs of improving it) is another example of the benefits of the collaborative One Health approach. Recently, WHO and OIE developed together an operational guide for member countries explaining how PVS principles and IHR obligations can be implemented together in a parallel way in full cooperation between veterinary services and public health services.

I commend the editors for putting together this textbook, which will further strengthen the efforts of OIE and provide a comprehensive overview for all those who want to put One Health to action for the betterment of the health of humans, livestock, companion animals and wildlife.

Bernard Vallat

World Organisation for Animal Health (OIE)

WHO Foreword

This book is a tribute to the advances being made in changing the paradigm to address effectively the health and well-being of people and animals within the environment that they share.

It is a significant resource not only for health and veterinary practitioners, but for the larger community that increasingly recognizes the benefits of interlinking different disciplines and sectors to solve problems at the interface of people, animals and their environment. It makes the case of complementarity and that pooling of expertise, data, knowledge, functional networks, operational systems and stakeholders translates into improved health outcomes, better livelihoods and increased effectiveness. The authors present case studies based on first experiences of how One Health policies can successfully be put into practice in a variety of settings, with a strong focus on the benefits, including the economic benefits, which can be achieved through integrated health approaches through One Health.

Bernadette Abela-Ridder
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