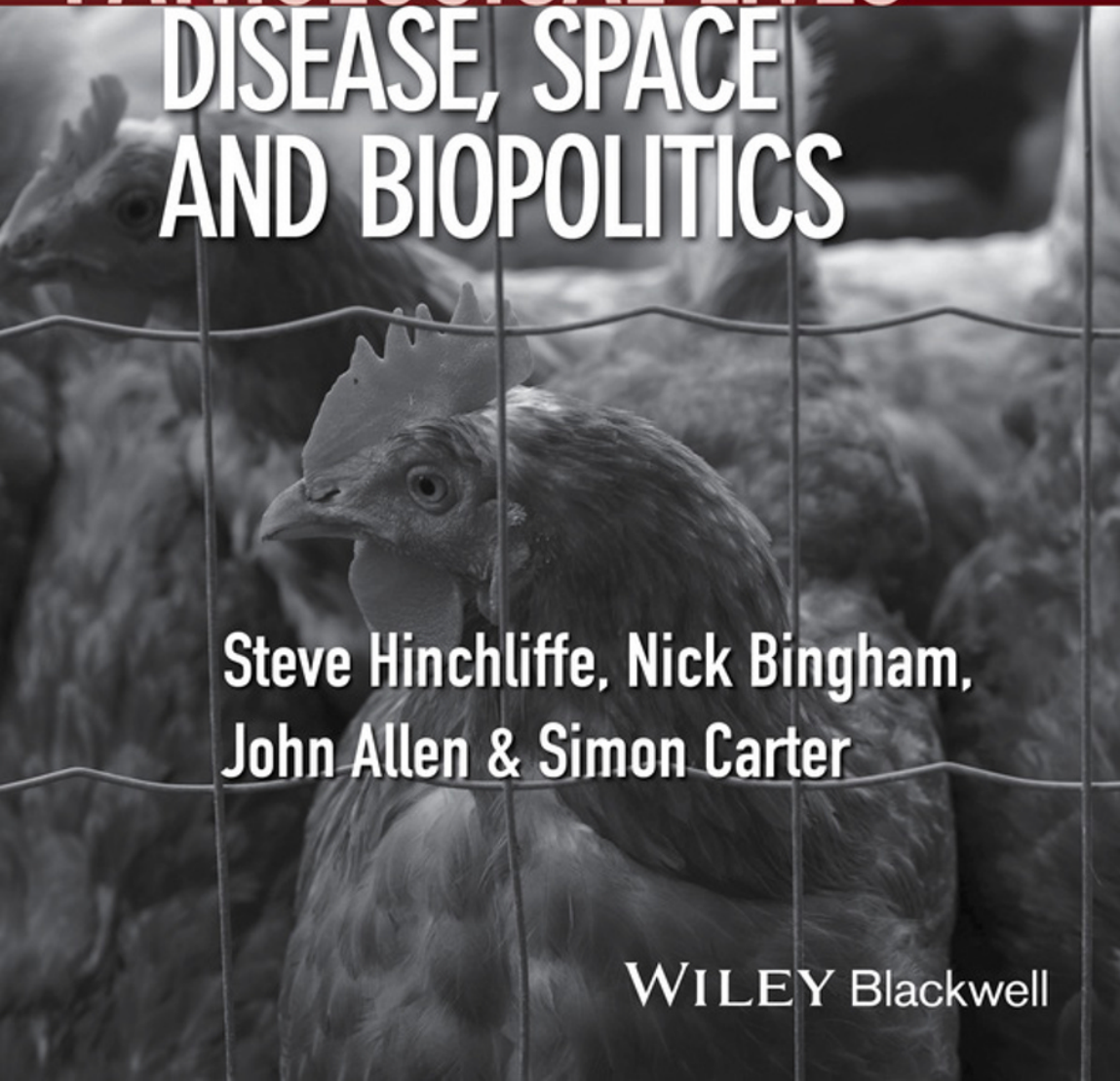
RGS-IBG BOOK SERIES

Royal Geographical Society with IBG

Advancing geography and geographical learning

PATHOLOGICAL LIVES
DISEASE, SPACE AND BIOPOLITICS



Steve Hinchliffe, Nick Bingham, John Allen & Simon Carter

WILEY Blackwell

Pathological Lives

RGS-IBG Book Series

For further information about the series and a full list of published and forthcoming titles please visit www.rgsbookseries.com

Published

Pathological Lives: Disease, Space and Biopolitics
Steve Hinchliffe, Nick Bingham, John Allen and Simon Carter

Smoking Geographies: Space, Place and Tobacco
Ross Barnett, Graham Moon, Jamie Pearce, Lee Thompson and Liz Twigg

Rehearsing the State: The Political Practices of the Tibetan Government-in-Exile
Fiona McConnell

Nothing Personal? Geographies of Governing and Activism in the British Asylum System
Nick Gill

Articulations of Capital: Global Production Networks and Regional Transformations
John Pickles and Adrian Smith, with Robert Begg, Milan Buček, Poli Roukova and Rudolf Pástor

Metropolitan Preoccupations: The Spatial Politics of Squatting in Berlin
Alexander Vasudevan

Everyday Peace? Politics, Citizenship and Muslim Lives in India
Philippa Williams

Assembling Export Markets: The Making and Unmaking of Global Food Connections in West Africa
Stefan Ouma

Africa's Information Revolution: Technical Regimes and Production Networks in South Africa and Tanzania
James T. Murphy and Pádraig Carmody

Origination: The Geographies of Brands and Branding
Andy Pike

In the Nature of Landscape: Cultural Geography on the Norfolk Broads
David Matless

Geopolitics and Expertise: Knowledge and Authority in European Diplomacy
Merje Kuus

Everyday Moral Economies: Food, Politics and Scale in Cuba
Marisa Wilson

Material Politics: Disputes Along the Pipeline
Andrew Barry

Fashioning Globalisation: New Zealand Design, Working Women and the Cultural Economy
Maureen Molloy and Wendy Larner

Working Lives – Gender, Migration and Employment in Britain, 1945–2007
Linda McDowell

Dunes: Dynamics, Morphology and Geological History
Andrew Warren

Spatial Politics: Essays for Doreen Massey
Edited by David Featherstone and Joe Painter

The Improvised State: Sovereignty, Performance and Agency in Dayton Bosnia
Alex Jeffrey

Learning the City: Knowledge and Translocal Assemblage
Colin McFarlane

Aerial Life: Spaces, Mobilities, Affects
Peter Adey

Millionaire Migrants: Trans-Pacific Life Lines
David Ley

State, Science and the Skies: Governmentalities of the British Atmosphere
Mark Whitehead

Complex Locations: Women's Geographical Work in the UK 1850–1970
Avril Maddrell

Value Chain Struggles: Institutions and Governance in the Plantation Districts of South India
Jeff Neilson and Bill Pritchard

Queer Visibilities: Space, Identity and Interaction in Cape Town
Andrew Tucker

Arsenic Pollution: A Global Synthesis
Peter Ravenscroft, Hugh Brammer and Keith Richards

Resistance, Space and Political Identities: The Making of Counter-Global Networks
David Featherstone

Mental Health and Social Space: Towards Inclusionary Geographies?
Hester Parr

Climate and Society in Colonial Mexico: A Study in Vulnerability
Georgina H. Endfield

Geochemical Sediments and Landscapes
Edited by David J. Nash and Sue J. McLaren

Driving Spaces: A Cultural-Historical Geography of England's M1 Motorway
Peter Merriman

Badlands of the Republic: Space, Politics and Urban Policy
Mustafa Dikeç

Geomorphology of Upland Peat: Erosion, Form and Landscape Change
Martin Evans and Jeff Warburton

Spaces of Colonialism: Delhi's Urban Governmentalities
Stephen Legg

People/States/Territories
Rhys Jones

Publics and the City
Kurt Iveson

After the Three Italies: Wealth, Inequality and Industrial Change
Mick Dunford and Lidia Greco

Putting Workfare in Place
Peter Sunley, Ron Martin and Corinne Nativel

Domicile and Diaspora
Alison Blunt

Geographies and Moralities
Edited by Roger Lee and David M. Smith

Military Geographies
Rachel Woodward

A New Deal for Transport?
Edited by Iain Docherty and Jon Shaw

Geographies of British Modernity
Edited by David Gilbert, David Matless and Brian Short

Lost Geographies of Power
John Allen

Globalizing South China
Carolyn L. Cartier

Geomorphological Processes and Landscape Change: Britain in the Last 1000 Years
Edited by David L. Higgitt and E. Mark Lee

Pathological Lives

Disease, Space and Biopolitics

Steve Hinchliffe, Nick Bingham,
John Allen and Simon Carter

WILEY Blackwell

This edition first published 2017

Registered Office
John Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

Editorial Offices
350 Main Street, Malden, MA 02148-5020, USA
9600 Garsington Road, Oxford, OX4 2DQ, UK
The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

For details of our global editorial offices, for customer services, and for information about how to apply for permission to reuse the copyright material in this book please see our website at www.wiley.com/wiley-blackwell.

Library of Congress Cataloging-in-Publication Data

Names: Hinchliffe, Steve, 1967– author. | Bingham, Nick, author. | Allen, John, 1951– author. | Carter, Simon, 1960– author.
Title: Pathological lives : disease, space and biopolitics / Steve Hinchliffe, Nick Bingham, John Allen, and Simon Carter.
Description: Chichester, West Sussex ; Malden, MA : John Wiley & Sons Inc., 2017. | Includes bibliographical references and index.
Identifiers: LCCN 2016028691 | ISBN 9781118997598 (hardback) | ISBN 9781118997604 (paperback) | ISBN 9781118997628 (epub) | ISBN 9781118997611 (Adobe PDF)
Subjects: LCSH: Microbial ecology–Health aspects. | Bioethics. | Communicable diseases–Epidemiology. | Human-animal relationships–Political aspects.
Classification: LCC QR100 .H56 2017 | DDC 577.8–dc23
LC record available at https://lccn.loc.gov/2016028691

A catalogue record for this book is available from the British Library.

Cover image: Photograph © Henry Buller, 2015

Set in 10/12pt Plantin by SPi Global, Pondicherry, India

10 9 8 7 6 5 4 3 2 1

To the memory of Professor Doreen Massey
An infectious intellectual, colleague and friend

Contents

List of Figures

Series Editors' Preface

The RGS-IBG Book Series only publishes work of the highest international standing. Its emphasis is on distinctive new developments in human and physical geography, although it is also open to contributions from cognate disciplines whose interests overlap with those of geographers. The Series places strong emphasis on theoretically-informed and empirically-strong texts. Reflecting the vibrant and diverse theoretical and empirical agendas that characterise the contemporary discipline, contributions are expected to inform, challenge and stimulate the reader. Overall, the RGS-IBG Book Series seeks to promote scholarly publications that leave an intellectual mark and change the way readers think about particular issues, methods or theories.

For details on how to submit a proposal please visit:
www.rgsbookseries.com

David Featherstone
University of Glasgow, UK

Tim Allott
University of Manchester, UK

RGS-IBG Book Series Editors

Acknowledgements

The work for this book was made possible with the generous support of the UK's Economic and Social Research Council. Two awards, 'Biosecurity Borderlands' (RES-062-23-1882) and 'Contagion' (ES/L003112/1) allowed us to conduct the field investigations and develop key conversations with actors in the field. The work has also benefitted from our co-researchers in those projects, especially the contributions of Dr Stephanie Lavau and Dr Kim Ward. Their observations and work on this project while at Exeter University have been instrumental in the generation of this book.

At the UK's Animal and Plant Health Agency, Steve Hinchliffe would like to thank Drs Richard Irvine, Jill Banks, Andrew Breed and Professor Ian Brown who were all incredibly patient as he learned the language of influenza viruses and animal surveillance. At the Food Standards Agency, Steve Hinchliffe would like to thank the secretariat and colleagues in the Social Science Secretariat and Research Committee, especially Sian Thomas and Helen Atkinson.

At Exeter University we are indebted to conversations with a wide group of scholars – Michael Schillmeier, Henry Buller, Katie Ledingham, Gail Davies, Ann Kelly, John Dupré, Astrid Schrader, Elizabeth Johnson, Jo Little, Robbie MacDonald, Sarah Crawley, Jamie McCauley, Andrew Pickering, Sabina Leonelli, Krithika Srinivasan, Sam Kinsley, Regenia Gagnier among many others.

A host of others have commented upon or shared conversations around this work. They include Carlo Caduff, Ian Scoones, Paul Forster, Melissa Leach, Gareth Enticott, Ben Fine, Susan Craddock, Melanie Rock, Bruce Braun, Frederic Keck, John Law, Annemarie Mol, Beth Greenhough, Jamie Lorimer, Andrew Barry, Pierre-Olivier Methot, Alex Nading, Rob Wallace, Andrew Donaldson, Kezia Barker, Stephan Price, Kristin Asdal, Linda Madsen and Ann Bruce.

We would also like to thank Dave Featherstone for his support and patience as editor of this series, and for the thoughtful comments of two anonymous referees whose comments were invaluable at the editing stage.

Chapters 4, 5 and 8 are substantial re-workings of material that is published in the *Journal of Cultural Economy*, *Geoforum* and in the edited book *Humans, Animals and Biopolitics: The More Than Human Condition* (Kristin Asdal, Tone Druglitrø and Steve Hinchliffe).

Foreword

Pandemics, epidemics, zoonoses and food-borne diseases have, for some at least, become key challenges for contemporary global society. They threaten progress in global health, compromise food security, and, along with climate change and global terrorism, seem to usher in a state of emergency and a radically uncertain future. Just as importantly, they are associated with often painful and life altering illnesses that can exact suffering on the part of people and animals as well as social and economic hardship.

Many of these diseases are associated with what have become known as emerging and re-emerging infections, a term that is often associated with a dynamic and unpredictable microbial world of recombinant viruses, resistant bacteria and mobile microbial genes. These microbes are testament, if any was needed, to the liveliness of the non-human world.

And yet these diseases are more than a matter of microbes alone. They are instead a product of relations that involve microbes, their hosts and their social as well as physical environments. That is, they are the result of bio-social clusters that involve and re-format economies, social practices, living bodies and microbes.

So rather than disease being 'out there' or 'to come', in the form of a pathogen waiting to attack, we prefer to think of life as to greater or lesser extents pathological, or prone to disease. For us, it is the configuration of various matters and living processes that makes life more or less healthy.

This is not to say that all lives are equally diseased, or that disease is everywhere, or that it is somehow already present. Clearly there are disease and illness events that mark distinct and often irreversible ruptures in daily life. But it is to say that we can usefully identify some lives and ways of living as more pathological than others. How these pathological lives fare is dependent, we argue in this book, on the quality of the spatial relations from which they are made.

So, rather than focus on pathogens and their exclusion from everyday living spaces as a means to address the threat of emerging disease, we take a different tack. We use pathological lives as a means to understand how so many contemporary

human and non-human animal lives are living on a knife-edge. In this view, the apparent stability of modern lives may, paradoxically perhaps, exhibit a form of fragility that is borne from their being lived at a threshold. It may take little, in other words, to push them over the precipice and into a pathogenic state.

Keywords

The book addresses a puzzle of how best to understand and respond to the rise of interest in and concern over emerging infectious and food-borne diseases. What is contributing to the recent growth of disease threats? How can we account for their persistent presence on political and public health agendas? In order to answer these questions we have mobilised some key terms that we will briefly introduce here before they are developed in detail in later chapters. These terms are not fixed in stone, but we hope they provide a handhold through the book's chapters and to the issue of pathological lives.

The first key term is **pathogenicity**, a word we use to highlight that infectious disease is always more than a matter for pathogens alone. In its more scientific usage, the term refers to the potency or effectiveness of a particular pathogen (a bacteria, virus or other parasite for example). But here we mean to underline the relational ways in which infectious diseases are made. In the simplest of senses this can refer to the basic notion that diseases are made from host-pathogen and environmental interactions. Pathogenicity is in this understanding borne out of the kinds of relations that hosts have with bacteria and viruses, their vectors and so on. A healthy host within a healthy population and environment is likely, for example, to reduce the pathogenicity of a microbe. In conditions of vulnerability, however, an otherwise inconsequential infection can take on life-threatening qualities. In this book we supplement this epidemiological 'matter of fact' with other relations that contribute to pathogenicity. They include economic relations generated through markets for livestock and their produce, labour relations that format the interrelations between human and animal hosts, governmental relations that affect the ways in which diseases are monitored and so on. Our argument is that it is the intensities of these relations, their spatial interrelations, that constitute the pathogenicity of a disease. Pathogenicity, or the ability for diseases to amplify and reach new levels of intensity, is an outcome of these and many other spatial and socio-material relations.

The second key term is **disease diagrams**. Diagrams refer to the ways in which diseases are understood and acted upon. For example, an infectious disease may be diagrammed as something to keep out through the installation of a barrier. Or it may be something to intervene in through the production of a vaccine, or other medicine. As might be obvious, there is often more than one of these diagrams in play at any one time, and the relative emphasis given to one diagram, or the specific mix of diagrams in play, can have effects on how a disease

evolves, how it interrelates with other diseases, where authority lies in relation to disease and who is deemed as responsible for health. How people respond to this diagramming of disease becomes a critical issue for disease management.

The third key term is **disease situations**. If we take the socio-material intensities that generate pathogenicity along with the specific suite of disease diagrams that are mobilised to both understand and intervene in disease dynamics, then together they start to define what we are calling a disease situation. In using the term, we have the following intentions:

- Situations are, first of all, meeting places, where numerous actors, bodies, species, pressures, flows, issues, decisions and so on are organised or brought together, or held apart or worked upon. They are heterogeneous (formed from their differences and relations), more than human, and dependent not only on what is meeting up but also how those meetings are spatially configured.
- Situations, like pathogenicities, are relational – that is their properties or character are generated by and generative of social, spatial and material relations. They are not structures. They are grounded in practices and orderings and are as such more or less open to change. Situations clearly owe a debt to the relational geographies that precede this work (Murdoch, 2005; Whatmore, 1997) as well as to a more general interest in spatial analysis and thinking topologically.
- Situations bear a family resemblance to the notion of assemblage, or the interrelations and co-production of various 'species' or unlike kinds (diagrams, microbes, populations and so on). Assemblage in our view is a process, and differs from a whole or a system in that these unlike kinds need have nothing in common. No one in that sense can speak for the whole situation. Nevertheless, these 'species' inter-mingle and can radically affect one another within their situation.
- Finally, and in a way that takes us beyond some treatments of assemblage, situations are more than descriptions of the atmospheres generated by the convergence and divergence of various interrelating practices and matters. They are also, crucially, eventful and as such may offer the ingredients for change and intervention. When you are in a situation you are invited to act. In other words, situations have a potentiality that can generate events, prompt a shift in attention and foment new actions. Situations are in that sense real and existing manifestations of multiple processes that also have a power to force thought. To be clear, this power is always 'a virtual one' that 'has to be actualised' (Stengers, 2005b: 185). How this power can be realised (by, for example, those who attend to the more than human details of a situation) is a matter that is taken up in later chapters in the book.

Together these terms help us to offer original insights into the current disease predicament. Once we take a situational approach, with its pathogenicities and

diagrams, we can identify the ways in which many current approaches to infectious and food-borne diseases tend to miss some vital clues in terms of how to make life safe. Or, worse, how these same approaches may in fact, and paradoxically, make life even less safe. Our contention is that once we take disease situations seriously we can start to question the norms and assumptions that so often underline current re-investments in life politics. Our argument is that we need to move away from a version of life politics (bio-politics) where norms are policed and re-enforced (often materially with a system of barriers and boundaries) to a lively politics (cosmopolitics) where we can use current disease situations to start to trace counter-norms, to identify suppressed modes of existence and in doing so find possible ways out of the current predicament.

Reading Pathological Lives

In order to develop these arguments, we have divided the book into two main sections. In Part I (Chapters 1 to 3) we introduce the book's approach and expand on the conceptual and methodological issues that relate to emergency diseases and pathological lives. We start by asking how emerging infections and food-borne diseases have been conceptualised or framed, and how these have informed approaches to disease management. Working spatially, in Chapter 2 we adopt the term 'disease diagram' to chart the history of approaches to and interventions in infectious disease and follow this with an account of how and why current approaches to disease tend to involve a particular mix of disease diagrams. The particular mix of diagrams is, we argue, both a matter for empirical enquiry and a key feature of what we call a disease situation. In Chapter 3 our attention becomes more methodological as we expand on what we mean by 'disease situations' and ask how we might re-configure conventional approaches to infectious disease. We outline some of the shifts required as we move from a geometry or topography of disease, with its focus on disease spread or extension over space, to one that is more attendant to the topologies of disease situations. The latter is concerned with the spatial intensities and relations that are generated in particular set ups and that make disease more or less likely.

Having set up diagrams and situations in Part I, in Part II we focus on a range of disease situations, or specific cuts through those situations. Following a short introduction to Part II, we start, in Chapter 4, in the hen house and look at the poultry industry as a main player in the re-diagramming of avian and zoonotic diseases. We then move, in Chapter 5, to the pig sty, and chart not only the pressures that make a disease situation but also the efforts by farmers and others to patch and piece together healthy lives. Food-borne diseases are our concern in Chapter 6, as we leave the farm and look at the ways in which food chains are understood and regulated. If Chapters 5 and 6 introduce the fraught politics of attention into pathological lives, Chapter 7 asks how likely this different politics

of life might fare in what we call disease publics. Chapter 8 uses fieldwork on wild and domestic birds, and on viruses, to look for a different kind of life politics that may be developed from these situated knowledges. Finally, in the Conclusions, we spell out what a re-oriented and spatialised politics of life means for the infectious disease issue.

It is of course possible to read the chapters individually, and to move between the situations that we trace in Part II, but they are not entirely stand-alone. Our hope is that the narrative of the book will carry readers through the various arguments developed in Part I, to the more empirical treatments in Part II. Note however that we rarely treat the theoretical and empirical as distinct. The arguments in Part I are all empirically grounded, while the situations in Part II often involve conceptual development.

Part I
Framing Pathological Lives

Chapter One
Pathological Lives – Disease, Space and Biopolitics

> The diversity and geographical distribution of influenza viruses currently circulating in wild and domestic birds are unprecedented since the advent of modern tools for virus detection and characterisation. The world needs to be concerned (WHO, 2015).
>
> The number one risk on the [UK] Government's national risk assessment for civil emergencies, ahead of both coastal flooding and a major terrorist incident, is the risk of pandemic influenza (House of Commons Committee of Public Accounts, 2013: 6).
>
> We are left in the hands of the generations which, having heard of microbes much as St Thomas Aquinas heard of angels, suddenly concluded that the whole art of healing should be summed up in the formula: Find the microbe and kill it. And even that they did not know how to do (George Bernard Shaw, 1909: Preface to the *Doctor's Dilemma*).

Introduction: The Emergency of Emergent Infectious Diseases

In Western states, at least, emerging infectious diseases have become emergencies in waiting. The threat of a widespread and acute malady affecting people, or indeed the plants and animals on which they rely (to say nothing of the technical infrastructures or other living and non-living networks which sustain

Pathological Lives: Disease, Space and Biopolitics, First Edition. Steve Hinchliffe, Nick Bingham, John Allen and Simon Carter.

life), is a long-standing one. But it is the imagined and to some extent experienced interdependencies and vulnerabilities that people share with each other and with other living bodies that seem to have raised the stakes in the last few decades. So much so that we are, for some at least, 'teetering on the edge' of a major disease event or catastrophe (Webster and Walker, 2003).

Simplifying somewhat, this apparent emergency-to-come has two core elements. First, it is *socio-ecological* and based on the sciences of 'emerging and re-emerging diseases'. Here the focus tends to be on mutable microorganisms and the potential for those organisms to wreak havoc in a highly 'infectable' and densely interconnected modern world (Braun, 2007). Previously, and in the main, microorganisms had been understood as more or less fixed entities that would inevitably run their evolutionary course, becoming less significant over time (Methot and Fantini, 2014). The emergence of new infectious diseases, like AIDS (Acquired Immune Deficiency Syndrome) and SARS (Severe Acute Respiratory Syndrome), and the re-emergence of newly virulent scourges (like influenza and tuberculosis) in the later part of the twentieth century suggested that life, and microbial life in particular, was less fixed and so less predictable than we might have countenanced.

These new agents of concern could mutate and recombine, jump species, take advantage of new environmental conditions, and could move through the dense and rapid transit routes that circled the planet. Instead of being on the wane, microbes were back on the agenda. Along with climate change and global terrorism, they formed a raft of 'agents' that were regarded as mutable, indeterminate and generative of catastrophic events. For some at least, global connectivity and molecular mutability had combined to usher in a new age of plagues, epidemics and pandemics (Garret, 1994). Arguably, emerging diseases suggested that the world was now more 'infectable' than ever.

Second, this emergency-to-come is *governmental*. Here, emergency relates to a form of anticipatory or future-oriented government that seeks to highlight (even give greater emphasis to) potential breakdowns in social order. In this style of governance of and through emergencies – which has arguably become dominant in recent decades (Amoore, 2013) – the role of public and private institutions is to organise for events that are of sufficient magnitude that they demand foresight and preparation (Anderson, 2010; Collier and Lakoff, 2008b).

Pandemics, infectious animal diseases and food contamination events, for example, can all exact such far-reaching challenges to social and economic life that they constitute security issues, necessitating some kind of civil emergency planning in order to prepare for or mitigate their worst effects. Infectious disease, in this sense, has become part and parcel of a logic and practice of security. Indeed, the term biosecurity is often used in relation to the threat of emerging infectious diseases, and refers to the raft of measures and policies that governments, commercial and other organisations seek to put in place in order to reduce the risk of a disease event and/or prepare for the consequences of such an event

in terms of emergency response. Whether the resulting biosecurity practices are effective or make matters more prone to go wrong is a major question that we will return to throughout this book.

These socio-ecological and governmental aspects of emerging infectious diseases may well be mutually re-affirming. First, and most obviously, changes to the 'infectability' of the planet may be accompanied by shifts in approaches to infectious disease control, leading to the rise of biosecurity as a discourse and material practice. Second, the rise of a form of anticipatory governance clearly requires its own set of justifications. Mutable microbes form a convenient ontology or cause under which new kinds of human authority and control can be justified and normalised (King, 2002). For some commentators, a mode of life (a *modus vivendi* (Sloterdijk, 2013)) emerges in which control is predicated on accentuating certain threats. This may be more than ideological. Perhaps what is most interesting here is the possibility that, third, these forms of human control can in turn produce new microbial environments that may inadvertently be even more challenging. Spiralling efforts to counter microbial threats, or a hypertrophic approach to security, can seed further changes to rapidly evolving microbiomes (Landecker, 2015). So much so that a belief in human authority and control may well be part of the problem.

Pathological Lives engages with the disease emergency, its rise up scientific and political agenda, its formatting through biosecurity and, crucially, the extent to which the resulting foci of attention may well be making matters worse rather than better. We focus on the particular ways in which emergency diseases are constituted – how they are understood, marshalled, measured, generated and even ignored. Our method is at once geographical and based within science and technology studies. In taking these approaches, with their legacy of fieldwork and 'theorising empirically' (Mol, 2002), we are interested in the practical 'doings' of disease rather than the grand stories that are told about them. Only by investigating practices (what is done as well as what is said) can we assess the extent to which these doings may play a part in bringing about the emergency they seek to mitigate – or, indeed, may offer new openings for doing things otherwise.

This book is empirically grounded, and in being so it can make some claim to a better understanding of how communicable diseases are being managed and mismanaged and will aim to make some concrete suggestions about what it takes to do health and disease in ways that are better suited to the current predicament. It is based on fieldwork that we undertook across a range of sites and involving all manner of species (from farms to restaurants, from wildlife reserves to virological laboratories, and from factories to living rooms). Our methods are varied, though mostly ethnographic in character and sensibility, and our aim has been to allow the practices that we have observed, written down and questioned, to surprise us, to put our concepts at risk and to force us to think carefully and critically about the disease emergency.

Pathological Lives is also conceptual. In working across numerous sites and species, and in linking together those sites and species, our argument pulls together key geographical or spatial insights on the relations between people, animals, microbes, infrastructures and ways of governing disease. Rather than focusing on one part of the disease system, we are interested in what happens when you take the changing relations between hosts, microbes and their environments, as well as the emerging regimes of control or governance, as the key concern for investigation. Infectious disease in this instance, and for us, is not only a result of microorganisms infecting a host, but the multi-faceted outcome of the changing relations that make microbes more or less likely to be effective in generating disease.

The key question becomes, in this sense, how various matters (including not only microbes) combine with other conditions to produce disease. We make a distinction, then, between those approaches that focus on disease as a matter of discrete causative agents and those that view disease as a more relational phenomenon. In the first instance, approaches to infectious disease management or control that focus on microbes as pathogens tend to emphasise their absence and exclusion. They involve constructing and maintaining real as well as metaphorical walls (see Figure 1.1).

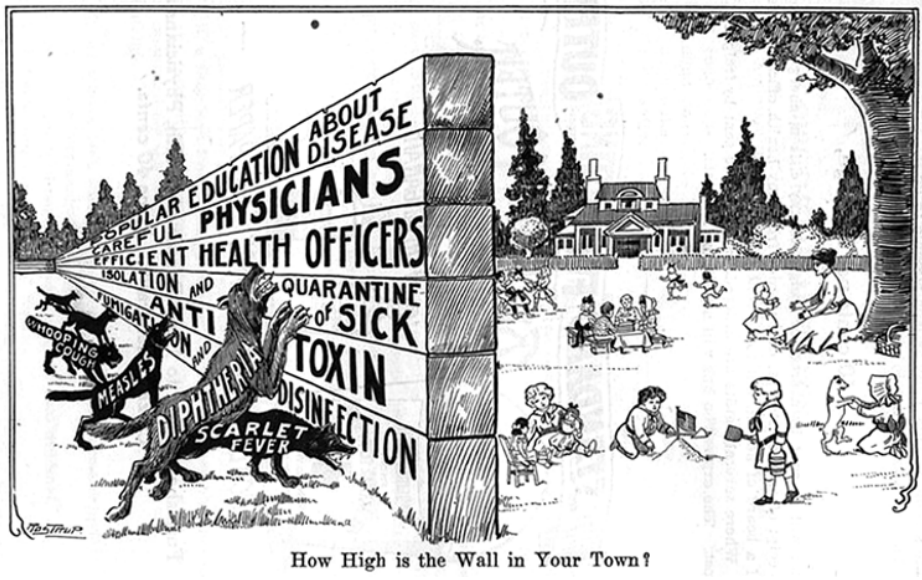


Figure 1.1 How safe is your town? – US Public Health Poster, undated. The divisions between a contingent wild world and a domestic culture are clearly marked as spatially exclusive. The existence of a single non-human on the right side of the wall, on two legs and with tail docked, is emblematic of this nature/culture binary that is in play. (*Virginia Health Bulletin*, 1908: 216).