Gavin J. Andrews · Valorie A. Crooks
Jamie R. Pearce · Jane P. Messina *Editors*

COVID-19 and Similar Futures

Pandemic Geographies

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Chapter 1
Introduction

Gavin J. Andrews, Valorie A. Crooks, Jamie R. Pearce, and Jane P. Messina

1 An Extensive Geographical Event, Requiring a Substantive Geographical Response

Most attempts to summarise the global pandemic seem inadequate, such is its immensity, complexity, constant evolution and current closeness. Yet, it is still important at the very start of this book to register some of the basic facts. First recorded in the Wuhan province in China in December 2019, at the time of writing—in early 2021—the novel coronavirus (SARS-CoV-2), and its resulting disease (COVID-19), has infected and affected 128 million people and killed 2.8 million across 217 countries worldwide. Such is the virus's ability to spread, early on in the crisis countries were forced to move from strategies to contain the disease (such as testing, tracing and isolating) to strategies to delay and reduce its peak prevalence, and hence limit the pressure it put on stressed healthcare systems until effective vaccines could be distributed (Rose-Redwood et al. 2020). In this regard, responses have been more widespread and highly consequential including (1) prioritised testing and wider tracking and tracing that have been implemented with different levels of success and met with varied uptake and acceptance; (2) border closures that have

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restricted international transmission but also personal travel; (3) quarantine and stay-at-home orders which have slowed community spread whilst reshaping daily mobility patterns, emptying public spaces and restricting social freedom and interaction; (4) restriction of business operations and practices which has reduced potential hubs of transmission but led to the loss of income and jobs; (5) an emphasis on 'essential workers' and roles—such as in healthcare, retail, transport and research—which has involved greater public recognition and solidarity but equally exploitation, exposure and risk; (6) enhanced public health and clinical services which have added to COVID-19 prevention and care but have not addressed rises in mental ill-health and untreated physical conditions; (7) the closure of educational institutions or their transition to online delivery, which has continued learning but impacted student welfare and likely achievement (Rose-Redwood et al. 2020); and (8) the curtailing of sports/fitness, arts and entertainment events and venues that, whilst reducing potential transmission, have impacted social and cultural life, happiness and fitness. Indeed, generally, changes have had profound impacts on population health, security and wellbeing; on economies, jobs and prosperity; on the political landscape; and on work, family and social and cultural life. Whatever the eventual outcomes of COVID-19 pandemic, and the developments that might arise on the way, it is already very clear that it represents not only one of the most significant health crisis of our time but something that, in terms of overall significance, will very likely stand as a major event in human history alongside other great events including other global pandemics; wars and conflicts; industrial, political, social and cultural revolutions; natural and environmental disasters; and key technological advances and moments. The impacts of COVID-19 will likely reverberate in the ways our world prospers and works for many years after the last case. Those of us who lived through it are likely never to forget it, and generations to come will likely be taught about it.

If we start with the fundamental question of why human geographers might be studying or need to study the pandemic, beyond its sheer scale as just noted, there are arguably two underlying reasons aligned with two of the disease's qualities: its 'completeness' and its 'geographicalness'. With regard to the former, Rose-Redwood et al. (2020:98) note: 'The COVID-19 pandemic is, first and foremost, a global public health crisis, yet its impacts extend far beyond the realm of epidemiology alone. We are also witnessing a political, economic, and social crisis the likes of which the world has not seen since the 1918 influenza pandemic and the Great Depression'. Indeed, arguably, when a health concern like COVID-19 and mitigation efforts impact and involve fundamental societal structures, almost all areas of society and social life, and most humans and the human experience, then more so than ever it becomes an issue for not only the health sciences but for the social sciences as well. This realisation has resulted in policymakers seeking out the expertise of social scientists in the immediate pandemic response to an extent that was previously unimaginable (e.g. the UK Government's *Scientific Advisory Group for Emergencies*, where membership now includes academics from disciplines including sociology, social policy and psychology). Moreover, from an intellectual viewpoint, COVID-19 becomes an issue for social sciences in their entireties—i.e. all of the theories, methods and empirical expertise they can bring to bear—not just for

their specialist health sub-disciplines and fields. Hence, for example, it becomes an issue for a vast breadth of sociology and not just the sociology of health and illness, for a vast breadth of economics and not just health economics, for a vast breadth of anthropology and not just medical anthropology and so for a vast breadth of human geography and not just health geography. This situation has begun to play out over recent months, the burgeoning scholarship on COVID-19 involving, as one might expect, scientific inquires in immunology, vaccinology, epidemiology and medical biology, as well as clinical studies on therapies and treatments, and research on public health strategies and healthcare systems and services. It also involves many social science commentaries and early empirical enquiries from multiple disciplines on diverse issues including information and media, social perceptions, behavioural responses, community responses, political leadership and numerous political, economic and social and cultural impacts (Depoux et al. 2020; McKibbin and Fernando 2020; Qian et al. 2020; Van Bavel et al. 2020; Wang et al. 2020). In sum, the multifaceted problem of COVID-19 has demanded, and has started to be met with, a multifaceted multidisciplinary response from the international research community.

With regard to the latter quality, for want of a better term for the 'geographicalness' of COVID-19, the disease and its mitigation have numerous spatial expressions and consequences that are critical to the course of the pandemic (Brinks and Ibert 2020). To mention but seven, geographies are evident, for example, (1) in the ways global transmission in a hyperconnected world of international movement has brought to the fore many global dependencies and the need for global governance on the issue; (2) in the ways different area-based, national, regional, local and city responses are constantly (re)produced, judged and compared for their relative efficacy and impact; (3) in the ways that micro-environmental conditions, spacings in and navigations of the built environment are a critical concern for addressing transmission; (4) in the ways highly geographical concepts are used, talked about and lived - containment, lockdowns, tracking and tracing, sheltering-in-place, home and social distancing, all now meaning something to us in our everyday lives; (5) in the ways in which the public at large have increasingly become amateur 'spatial epidemiologists' watching local morbidity graphs steepen or flatten, watching infection rates change across maps (often critiquing them and what they are showing) and debating concepts such as 'herd immunity' that suddenly mean something to our lives and for our futures; (6) in the ways we experience affective atmospherics of uncertainty and fear—some purposefully created by officialdom and many by media—but equally and more positively how we might experience affective atmospheres of community support, cooperation and hope often encountered in new (local) geographical configurations; and (7) in the ways in which, under pandemic conditions, cyberspace has increasingly replaced physical space, providing even more of a place for us to occupy and communicate throughout our working and personal lives. In sum then, Rose-Redwood et al. (2020) observe that COVID-19, and measures to mitigate it, have transformed the space economy, socio-spatial relations, socionatures, geopolitical landscapes, global dynamics and processes, multiscaled mobilities and relations through space and in place.

At the time of writing, emerging work in human geography on COVID-19 involves a variety of topics and issues falling into no less than 14 broad categories: (1) tracing, mapping and modelling the transmission of the disease and its implications for control and care (Boulos and Geraghty 2020; Brice 2020; Brunsdon 2020; Chung et al. 2020; Cuadros et al. 2020; Dangermond et al. 2020; Desjardins et al. 2020; Franch-Pardo et al. 2020; Mooney and Juhász 2020; Mayer and Lewis 2020; Mollalo et al. 2020; Tedeschi 2020; Zhou et al. 2020), including investigating the spatiality of infection hotspots (Harris 2020; Kulu and Dorey 2020); (2) identifying geographical risk factors affecting vulnerability including local population density, air pollution and aspects of the built environment (Amram et al. 2020; Hamidi et al. 2020), and consideration of the role of specific national and regional social and economic processes including investment and infrastructure, industrial base, labour market characteristics and other macro-level concerns (Adler et al. 2020; Boterman 2020; Gong et al. 2020); (3) connections to more-than-human natures and biopolitics (Blue and Rock 2020; Malanson 2020; Searle and Turnbull 2020; Springer 2020); (4) materialities, technologies, data and communications (Burns 2020; Chen et al. 2020; Cinnamon 2020; Liu and Bennett 2020; Mooney and Juhász 2020; Mohamad 2020; Rogers et al. 2020; Stephens 2020; Yang et al. 2020; Zeng et al. 2020); (5) family, home and work conditions and life (Brydges and Hanlon 2020; Iacovone et al. 2020; Katta et al. 2020; Manzo and Minello 2020; Reuschke and Felstead 2020; Stephany et al. 2020; Walsh 2020), including teaching and researching geography and other disciplines (Bagoly Simó et al. 2020; Hazen 2020; Rose-Redwood et al. 2020); (6) key changes for the production and consumption of goods and services (Bryson and Vanchan 2020; Dannenberg et al. 2020; Li et al. 2020; van Eck et al. 2020); (7) politics, geopolitics and governance (Delaney 2020; Grydehøj et al. 2020; Hoffmann Pfrimer and Barbosa 2020; Jauhiainen 2020; Opillard et al. 2020; Willi et al. 2020), including the roles of key organisations and institutions (Bryson et al. 2020; Mendes and Carvalho 2020); (8) financial and economic systems (Flögel and Gärtner 2020; Sokol and Pataccini 2020; Wójcik and Ioannou 2020); (9) inequality, disadvantage, marginalisation, stigma and discrimination (Browne et al. 2020; Eaves and Al-Hindi 2020; Leonard 2020; Van Uden and Van Houtum 2020; Zhang and Xu 2020); (10) civic responses, social movements and activism (Chang 2020; Perng 2020; Mendes 2020); (11) spatial, mobile and bodily practices (Barry 2020; Mondada et al. 2020); (12) cities, urbanisation and public space (Connolly et al. 2020; Chen et al. 2020; Finn and Kobayashi 2020; Honey-Rosés et al. 2020; Hesse and Rafferty 2020; James 2020; James et al. 2020); (13) structural circumstances in the developing world (Finn and Kobayashi 2020; Lawreniuk 2020); and (14) multiscaled (im)mobilities (Haugen and Lehmann 2020; Mostafanezhad et al. 2020; Walsh 2020; Ward 2020) including tourism (Brouder 2020; Lapointe 2020; Renaud 2020). Notably, at least half of the above work was published in three journal special issues in mid-2020 within the first 4 months of the pandemic (*Tourism Geographies*, 22, 3; *Dialogues in Human Geography*, *10*, 2; *Tijdschrift voor economische en sociale geografie*, *111,* 3). Whilst this was a very valuable quick start, the current book's chapters were finalised 5–7 months later when the severity, or ephemerality, of many impacts and responses have become

clearer, most connected to a 'second wave' of infection, and the lagged repercussions are becoming apparent. Moreover, many of these early papers in the SIs were commentaries focused on quite specific empirical issues, locations and places, whilst the current book is entirely focused on the implications of COVID-19 for established fields and areas of human geography. Indeed, this edited collection provides varied theoretical, empirical and methodological entry points to understanding the ways in which geographies are implicated in the COVID-19 pandemic. It showcases the full range of perspectives and concerns the discipline of geography can bring to the table and the full range of multiscalar geographies the discipline can expose. It brings different types of scholarship together in one place with a common purpose, providing one source of multiple geographical voices and approaches.

Given what we know about human history, it is likely that sometime in the future, the world will be faced with other pandemics of equal or perhaps even greater magnitude. In this regard, this book, alongside other published outputs, might contribute to our preparedness for them and our responses, both providing knowledge on geographical realities that might emerge and showcasing the scope and potential of what, as a discipline, geography can do (note—this being why the book's title includes the words '…and similar futures'; this speaking to how it is not just a frozen snapshot of circumstances at one particular time). In short, the book's wider legacy might be deepening our understanding of current and future global challenges that require a wide-ranging but integrated set of research and practice approaches.

2   The Academic Track-Record of Researching Infectious Disease Geographically: From 'Old' to 'New' Pandemic Geographies

Whilst we might make claims, as mentioned above, about the current contribution and future potential of geography, we must also recognise that studying infectious disease geographically is certainly not new and the recent interest in COVID-19 is the latest moment in a long storied engagement reaching back over 200 years. We need to acknowledge this history and what geographical research on COVID-19 might take from and add to it in a move from 'old' to 'new' pandemic geographies.

The geographical study of infectious disease can be characterised by three phases and forms of development, the latter two of which run concurrently. The first phase involved the initial pioneering geographical work of physicians or what is known as 'geographical medicine' (see Barrett 1998, 2000a, b, c) which itself involved three strands:

1. Geographical analysis—often alongside early cartography—in scientific social medicine (eighteenth and nineteenth centuries). Early pioneers here included Valentine Seaman (1798) whose work incorporated a 'spot map' of occurrences of yellow fever in the Lower East Side of New York; John Snow whose 1854

map famously showed clustering of cholera cases around a Broad Street, London, water pump (Snow 1855); and Alfred Haviland who used national mortality statistics to predict causes of tuberculosis and other diseases (Haviland 1892).

2. The development of tropical/colonial medicine under empire building (eighteenth and nineteenth centuries). Here scholars who focused on 'exotic' places included August Hirsch whose three volume series addressed cholera, plague and malaria in specific regional contexts (Hirsch, 1859–1864) and Leonhard Finke who helped further develop early medical cartography, likely producing the first World Map of Disease in 1792, and influenced through his research on the health of indigenous populations (Finke 1792). As Valencius (2000) argues, Hirsch, Finke and other scholars established rigorous approaches that would see a new era of geographical medicine become more widely accepted as a bona fide medical science. Not unexpectedly however this particular history has been re-examined from a postcolonial perspective, and geographical medicine is now recognised very much as tool and technical discourse of imperial power, for the most part tackling its own negative health consequences (Anderson 1998; Ernst 2007; Valencius 2000).

3. New developments aligned with the rise of bacteriology (late nineteenth and early twentieth centuries). This led to studies of the relationships between diseases and geographical phenomenon that might cultivate them or assist vectors of transmission (e.g. temperature, humidity, elevation, soil composition, pollution). In this vein, a flourish of key books emerged in this era including *Disease Pathology* (Davidson 1892); *The Geography of Disease* (Clemow 1903); *Geographie Medicale* (Laurent 1905) and, as noted earlier, *The Geographical Distribution of Disease in Great Britain* (Haviland 1892).

The second phase in the geographical study of infectious disease was critical to the emergence and early development of 'medical geography' as a sub-discipline from the mid-twentieth century. A key figure here was Jacques May who established the initial methods and objectives of the sub-discipline (May 1950) and introduced an early ecological approach (May 1959). The latter described the interplay of pathogens and geographical factors as 'geogens', this being the sub-discipline's first 'in-house' concept (Brown and Moon 2004). Later, other key figures began to influence the development of medical geography, notably Peter Haggett and Andrew Cliff from the 1970s onwards whose work dealt explicitly with space and place, and introduced the first models of disease diffusion often within a historical analysis (Cliff et al. 1983, 1992, 1993, 2004; Haggett 1976, 1994, 2000). Following them, other leaders emerged and extended May's ecological approach. Notably, Melinda Meade developed a 'triangle of disease ecology' (environment/habitat, population/demography, culture/behaviour) to explain disease diffusion (Meade 1977). The approach was then picked up by Jonathan Mayer and others whose work added political ecology and political economy as frameworks emphasising the interactions between political, economic and social concerns, resulting in a more systemic appreciation of disease and health (King 2010; Mayer 1996, 2000). As Sabel et al. (2010) note, due in no small part to the pathways forged by these early medical

geographers, the geographical study of infectious disease now includes consideration of a wide range of forms: those airborne, waterborne, food-borne and vector-borne and those spread through direct physical contact, as well as numerous aspects of environmental and population dynamics (e.g. Kolivras and Comrie 2004; Messina et al. 2010, 2011, 2015, 2016; Smallman-Raynor and Cliff 2004). Most notably from the early 1990s, medical geography has been at the forefront of development and training in geographic information systems (GIS); these are used for integrating environmental, socio-demographic and health data, and representing and modelling infectious disease, increasingly in disease surveillance systems (e.g. Glass et al. 1992; Huang et al. 2012; Rogers and Randolph 2003). GIS, is a major interest of the journal *International Journal of Health Geographics*, launched in 2002, not to mention it being used in numerous studies published in mainstream medical journals. Keeler and Emch (2018) helpfully note some important future challenges for this second phase and the quantitative geographical study of infectious disease. On one level, their recommendations are quite practical such as integrating new technologies—including Global Positioning Systems—to map transmission patterns and more generally working with smart devices. On another level, their recommendations are more fundamental including working with the emerging academic fields of landscape genetics and epigenetics (mapping genetic data in pathogen evolution and spread) and working more with big data (and overcoming related access, analysis and multidisciplinary challenges).

The third phase in the geographical study of infectious disease has involved an unprecedented and radical opening out research, and a reimagining of what it could be, under the broader sub-disciplinary transformation from medical geography to health geography in the 1990s. As well as an interest in health and wellbeing (i.e. matters beyond disease), this has involved a conceptual emphasis on place as a lived and experienced social phenomenon that effects the nature of health, illness and care (Kearns 1993). It has also involved the uptake of critical theory and qualitative methods to interpret and investigate these fundamental dynamics (Kearns and Moon 2002). Hence, whereas other phases in the geographical study of infectious disease have owed much to, and have reflected, ongoing developments in medical sciences, the third phase has owed far more to and reflected the cultural turn in human geography (Kearns and Moon 2002). Specifically, scholars have explored the social drivers, contexts and implications of infectious diseases, as well as political, policy and economic consequences and responses. Important to the development of this phase has been the contribution of key scholars and key empirical foci. With regard to the former, for example, Susan Cradock's path-breaking historical work has explored the role of infectious disease and related health policy in the construction of race, gender and class and in urban development (Craddock 1995, 1998, 1999, 2000a, 2001). With regard to the latter, for example, a focus specifically on HIV/AIDS has allowed scholars to collectively dig deeper and draw out the numerous social relations in infectious disease (Craddock 2000b, 2007; Kearns 1996; Smyth and Thomas 1996; Wilton 1996; Yeboah 2007). Also notable however is a range of geographical research that, although not always focused explicitly on infectious disease, has an important contextual connection to how it plays out or is mitigated. Here, for

example, scholars have focused on public and global health discourses and interventions (Brown 2011; Budd et al. 2009); on urban conditions, travel and migration (Bender et al. 2010; Budd et al. 2009; Oppong et al. 2015); and quite specifically on needle and medical phobias (Andrews 2011; Andrews and Shaw 2010). Notably, the most recent development in this third phase has been the emergence in the last decade of two closely related theoretical traditions. On the one hand, a critical post-structuralist approach concerned with power relations and biopolitics in infectious disease and 'infection' more broadly, including issues related to biosecurity and regulation (Brown and Knopp 2010; Hinchliffe et al. 2013, 2016). On the other hand, a broadly vitalist posthumanist approach, which sees the world in distributed and networked terms, and regards infectious disease to be emergent in and across assemblages of multiple human and non-human actors and forces (Greenhough 2012a, b; Hodgetts et al. 2018; Lorimer 2016; Lorimer and Hodgetts 2017). This is an approach that has constituted somewhat of a critical 'return' to the processes of infectious disease. Notably, this latest phase in geographical enquiry on infectious disease has involved, for the first time, scholarship from a good number of geographers who are not medical/health geographers. Hence, in many respects, the emerging interest in COVID-19 across human geography as a whole represents a rapid intensification of a process already occurring, whereby infectious disease was becoming an interest of human geography as a whole deploying a greater range of theories and frameworks.

This book bridges the last two contemporary phases of enquiry in the context of COVID-19, showcasing the value if each is simultaneously brought to bear. Indeed one observation of the above literatures is that they are so often 'separate worlds', produced by disparate research communities that may not necessarily disagree on events in the world, yet due to theoretical and methodological separation, rarely collaborate or communicate. One only needs to consider previous geographical research on common colds and influenza to see this separation in action, which on the one hand involves expansive quantitative mapping of case patterns and population and environmental dynamics (Cumming et al. 2015; Fuhrmann 2010; Pyle 1986; Patterson and Pyle 1991), and on the other hand involves in-depth qualitative examinations of illness, practice, research and policy (Giles-Vernick et al. 2010; Greenhough 2012a, b; Roe and Greenhough 2014). Similarly, past geographical research on the 2003 SARS disease outbreak (novel coronavirus SARS-CoV-1) was divided between mapping projects/spatial modelling (e.g. Boulos 2004; Bowen and Laroe 2006; Cao et al. 2003; Lai et al. 2004; Shannon and Willoughby 2004; Wang et al. 2008) and close social and political examination (e.g. Affonso et al. 2004; Ali and Keil 2007, 2011; Keil and Ali 2006a, b, 2007). Although all infectious diseases have physical processes and social contexts/impacts, both with geographical expression, the current crisis brings their interdependence and interrelationship to the fore in incredibly stark terms. The book reflects this. Besides revealing the value and potential of medical, cultural, historical, social, political, urban and rural geographies and more, it reveals what researching pandemics in the most expansive geographical way possible looks like. As such, we would like to think that the book will be of interest and value to a wide audience, ranging from student and professional

geographers, to scholars in related academic disciplines, to individuals working in policy creation and in non-governmental organisations tasked with formulating responses to COVID-19 and other pandemics.

3   Navigating the Book

To achieve maximum coverage, this book is comprised of 57 further chapters, each being relatively concise (about 2500 words). In all chapters, authors first set up a particular area of geographical expertise and research and then reflect upon how the COVID-19 pandemic might offer this area a new perspective, direction, challenge or opportunity. Chapters are organised into five thematic groups/sections. The *first* section of nine chapters is concerned with common theoretical perspectives and approaches in human geography and how, as lenses, they might be used to inform and frame geographical research on COVID-19. Specifically, these chapters explore spatial epidemiology; disease ecology; political ecology; political economy; complex systems and population health; historical approaches; humanism and social constructionism; poststructuralism, and non-representational theories. The *second* section of 18 chapters is concerned with substantive issues—in other words, empirical issues and topics that have arisen as part of the pandemic and its mitigation. Specifically, these chapters explore public health responses; health service capacities; the informal sector; resilience and risk; transnational mobility; everyday mobilities; media and information; social capital and community; social and health inequalities; maintaining wellbeing; maintaining health and fitness; surveillance control and containment; economic and social consequences; geographical terminologies in everyday life; geopolitical superiority and governance; digital life; animal relations, and environmental change. The *third* section of 11 chapters is concerned with key places and spaces impacted by COVID-19. Specifically, these chapters explore home; long-term care environments; public spaces; consumer spaces; places of transportation; cities; rural areas; global spaces; green and blue spaces; developing world, and arts spaces. The *fourth* section of 12 chapters is focused on people and how physical, psychological, demographic and situational factors come into play in the differential experience of COVID-19. Specifically, these chapters explore pathogens and bodies; older people; children and families; indigenous peoples; ethnicity; gender; disabilities; homelessness; mental illness; health professionals; workers and working; domestic alcohol consumption. To wrap up, the *fifth* and final section of seven chapters deals with methodological and broader research and practice issues. Specifically, these chapters explore public scholarship; qualitative methods; quantitative methods; GIS and spatial representations; big data; knowledge translation/impact agenda, and interpreting popular representations. These five sections are by no means discrete, and in many cases, it is easy to see how a chapter could have been placed in a section other than the one it is placed in. Indeed, chapter placement only represents a 'best fit' within five relatively loose categories, which possesses a certain degree of overlap. Still even with

57 further chapters, we cannot cover all theories, issues, places, people and research issues related to COVID-19. This is because, as noted earlier, quite simply the pandemic is a world issue affecting almost everywhere and everybody in one way or another.

4   Beyond the Book…

Notably, we purposefully do not provide a concluding chapter as is provided in many edited books because the question of 'where next?'- and the future research agenda for an entire academic discipline on COVID-19- is simply too extensive and complex to ever do justice to in a single narrative. It is also too early in the course of the pandemic, and hence too early in the course of corresponding scholarship, to answer fundamental questions such as what in research has been overdone, neglected, done well and done poorly, all of which would constitute the basis of such a conclusion. Instead, as noted, forward-looking ideas are part of every chapter, provided by each author as they focus on their specific field and topic. Having said this, we believe that the following very broad considerations will be of importance moving forwards:

4.1   Trans-subdisciplinary Research

Consideration needs to be given to opportunities for combining and integrating different empirical concerns, methods and theories from across human geography, so that future pandemic geographies draw on the strengths of different parts of the discipline to create a more informed, holistic and tailored approach. Currently, quite naturally, scholarship on COVID-19 seems to be based on scholars' own areas of geographical expertise, but collaboration, cooperation and synthesis can pay dividends in terms of enhancing the quality and potential of future research.

4.2   Transdisciplinary Research

Attention needs to be given to breaking down disciplinary boundaries—such as between human geography and the health sciences—and combining perspectives. As above (4.1), this to maximise the potential of research through the creation of a more informed, holistic and tailored approach, but also because the pandemic itself has circumvented disciplinary boundaries, leading to questions about their future strength, position and relevance.

4.3 Academic Structures

Geographers need in the future to be both ready and able to respond to pandemics, and their efforts need to be acknowledged and rewarded. Attention therefore is required to varied structures—such as funding sources, disciplinary organisations and conferences, and academic audits—so that future efforts to research pandemic geographies are more quickly and easily deployed. One useful development, for example, would be to form a working group—perhaps connected to a national geographical association—focused on pandemic geographies. The initiatives it might involve (such as a website, meetings and conferences), might provide scholars with the opportunity for dialogue and to share ideas.

4.4 Knowledge Translation and Mobilisation

Attention is required to knowledge translation and mobilisation so that the impact of geographical research is maximised. This includes both traditional approaches (such as academic publication and working on policy groups) and more novel approaches (such as in public geography and arts-based approaches), the latter of which can, at times, be activist in nature, seeking to directly act into and change the course of events. Knowledge translation and mobilisation will become critical in the future as it looks likely that a deluge of COVID research will emerge from numerous academic quarters.

4.5 Disciplinary Profile

Efforts are needed to increase the profile of geography and its perceived 'usefulness' in tackling major public health crises—including pandemics—in the future. Despite the many geographies associated with the current pandemic, it is often not geographers but other academics who are 'out there' informing the public and advising officialdom. This effort might pay unexpected or secondary dividends, such as attracting students and funding to the discipline.

4.6 Post-pandemic Geographies

Consideration of the issues arrising coming out of and after the pandemic is vital. At the time of writing, three vaccines have been developed and initially distributed, and others are on the horizon. With regard to the future, questions include: What might constitute 'vaccine geographies' or more broadly 'post-pandemic geographies' in all their diversity? What lessons are taken by academics and officialdom from the chapters of this book and from aligned research?

These are six considerations that we feel emerge after reading and reflecting on the book's chapters. Each potentially evokes many subsequent questions and themes which are certainly worth teasing out and exploring in the future. Meanwhile, it is quite possible that scholars might derive completely different questions and priorities from the book's chapters, and their own articulation of these would certainly be welcome. In short, there is a lot to be addressed in the future development of pandemic geographies as a field of human geography and its integration into wider pandemic research and practice.

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Part I
Theoretical Approaches and Perspectives

Chapter 2
Spatial Epidemiology: Challenges and Methods in COVID-19 Research

Varun Goel and Michael Emch

1 Introduction

The COVID-19 pandemic, caused by the novel SARS-CoV-2 virus, has had a profound global impact, with over 37 million confirmed cases and 1 million deaths as of October 2020. As public health officials around the world grapple to understand and contain disease spread, the first critical and fundamental step has been to apply the principles of epidemiology—searching for similarities, differences, and correlations by examining characteristics of *person*, *place*, and *time*. This is especially important, since the impacts of the pandemic are unequally distributed, which is evident by highly variable incidence rates in different places. This variation in severity and spread of the disease can partially be explained by heterogenous geographic contexts at both local and global scales. Since the spread of an infectious disease such as COVID-19 is inherently a spatial process, spatial theories and tools are useful. Spatial epidemiology enables us to describe and analyze the risk and patterns of COVID-19 at multiple spatial scales. In exploring these patterns, a spatial epidemiological framework not only considers the distribution of the disease agent but also the socioeconomic, behavioral, and demographic aspects of human populations and the natural, built, and social environment, in which humans and SARS-CoV-2 interact.

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2   Spatial Epidemiology and Challenges of COVID-19

The distribution of COVID-19 morbidity and mortality has exhibited extraordinary shifting spatial patterns at both local and global spatial scales. Since the declaration of the disease as a pandemic on March 11, 2020, the global epicenter of COVID-19 has shifted from Wuhan, to Italy and Iran, to New York, and now throughout the USA, South America, and India as of October 2020. Even within countries, spatial patterns have shifted considerably. For example, from March to May 2020, major cities on the west and the east coasts of the USA, especially New York, were the most affected by SARS-CoV-2, and then the burden of disease shifted to the southern USA, including rural areas.

Compared to other similar viruses such as influenza, there are several unique characteristics of SARS-CoV-2 that make analysis of patterns and risk difficult. There are significant lags in detection of SARS-CoV-2 from the time of exposure, and it may take several weeks for cases to be registered in statistics that public health officials can act upon. Additionally, asymptomatic infections may go completely unnoticed through passive surveillance systems, and people without symptoms are more likely to travel outside their homes, creating both a temporal and spatial mismatch between exposure to the virus and official reporting of cases. The virus is highly transmissible, yet exhibits uneven disease spread. While restrictions on human mobility may curtail disease spread, a single "super-spreader" event can cause a major outbreak in a seemingly low-risk area. Such variability in dynamics of SARS-CoV-2 diffusion is compounded by a fragmented public health response in many parts of the world including the USA. Public health interventions have been siloed and have focused on interrupting transmission within but not across regional boundaries. This patchwork of health interventions has resulted in spatially heterogenous epidemic curves without attention to potential of spatial spillovers. The result has been that areas that successfully flattened the curve have sometimes experienced a resurgence in cases and deaths. Spatial epidemiological theories and methods are critical to address these unique challenges posed by COVID-19.

3   Spatial Epidemiology Approaches

In this section, we highlight three important approaches of spatial epidemiology that can be used to better understand drivers and risk of SARS-CoV-2 transmission and inform a holistic and coordinated public health response.

3.1 Analyzing Place-Based Context and Mechanisms of Disease Transmission

Factors such as age, population density, socioeconomic status, testing capacity, and public health infrastructure are important factors that determine COVID-19 spread and severity. Yet, there is no single combination of factors that explains observed differences in COVID-19 patterns across countries, states, counties, and other regions. For example, while east and west coast areas in the USA are at higher risk due to contextual factors such as population density and dense travel routes, there is increased risk in the southeastern USA due to social factors such as a larger proportion of at-risk populations including communities of color with high levels of poverty, comorbidities, and low levels of health insurance coverage (Chin et al. 2020). Hence, while social distancing measures may be enough to reduce risk on the east and west coasts, such measures may not be enough in the southeastern USA and would need to be supplemented by interventions that address vulnerability through financial aid and expanded health care.

Similarly, neighborhoods and health theory along with multilevel modeling methods can be used to conduct deeper epidemiological inquiries into multi-scalar determinants of COVID-19 risk and infection. For example, in a study of pregnant women in New York City, neighborhood *compositional* effects such as high unemployment and more people living in households and *contextual* effects such as lower neighborhood assessed value were both associated with higher odds of COVID-19 infection, even after accounting for individual-level characteristics (Emeruwa et al. 2020). This example highlights the importance of considering specific place-based urban environment and social determinants of SARS-CoV-2 transmission and can inform public health interventions in specific populations. Such place-based research inquiries can also be extended to studying how multi-scalar neighborhood contextual variables affect the efficacy of current non-pharmaceutical interventions (NPIs), such as social distancing, and other interventions, such as vaccine implementations. For example, with expected increase in vaccine hesitancy, neighborhood-level vaccination rates will be important determinants of herd immunity and protection for unvaccinated individuals (Neumann-Böhme et al. 2020).

3.2 Incorporating Spatial Heterogeneity and Spatial Dependence

Currently, most epidemiological modeling efforts aimed at explaining COVID-19 are *global*; although they may stratify observations by geography, they assume that the relationship between a predictor variable and the modeling outcome is constant across space (Walker et al. 2020). Additionally, these models assume independence among observations and that the risk of COVID-19 in a region is not influenced by risk in surrounding regions. For an infectious disease like COVID-19, such

assumptions can induce important biases and produce inaccurate results and conclusions. For example, major statistical areas such as the Washington-Arlington-Alexandria metropolitan area traverse multiple US state boundaries. The spatial interaction and human mobility in these areas suggest *spatial dependence* and that the risk of COVID-19 will be more similar among these areas compared to other areas in their respective states. This also suggests that implementation or lack of NPIs in part of these multistate commuting zones is likely to impact neighboring zones in other states. Spatial epidemiology provides approaches to investigate spatial dependence and spatial heterogeneity, such as spatially varying coefficient models and geographically weighted regression, to account for modeling geographic processes and the variation in relationships among variables over space.

3.3 Integrating Novel Geo-referenced Data

Amidst the SARS-CoV-2 outbreak, the main surveillance arsenal includes virologic testing through nasopharyngeal swabs and other methods, serologic testing through antibody tests, and physical contact tracing. However, issues such as spatial and temporal heterogeneity in testing capacity, limitations of contact tracing in areas with widespread community transmission, and lack of reliable virologic and serologic testing have hampered efforts to gauge the full extent of the outbreak and the main factors driving disease transmission. Recent research has leveraged a variety of digital data streams such as anonymized cell phone records, social media sentiments, and Google searches to predict COVID-19 diffusion and infection rates (Kogan et al. 2020). These *high volume, high velocity, and high variety* datasets are often geo-referenced, have very high spatial and temporal coverage, and can be used to better characterize human mobility.

Using novel geo-referenced data, however, will present ethical and methodological challenges. Using fine resolution disease distribution data to map raw COVID-19 testing results for small areas may expose vulnerable and marginalized groups to deductive disclosure. Similarly, underrepresentation of historically marginalized populations and rural populations in data used to inform surveillance efforts may further exacerbate disparities in testing and disease burden in those vulnerable populations. Hence, spatial methods including spatial smoothing, geo-masking, and spatially representative sampling will be pivotal in informing a sound and equitable public health response.

4   Case Study: Racial, Ethnic, and Geographic Disparities in SARS-CoV-2 Testing in North Carolina

We provide one example of an analysis that uses a spatial epidemiology approach to study COVID-19. Spatial methods were used to describe the spatial patterns of SARS-CoV-2 testing and test positivity in North Carolina during the first 3 months of the state's COVID-19 pandemic and to determine if there are racial and ethnic disparities in testing in historically marginalized groups. Data used in the analysis are all SARS-CoV-2 test results reported to the North Carolina Department of Health and Human Services from March 1 to June 1, 2020, and include the date of test, test result, race, Latinx ethnicity, and county of residence. The racial-ethnic composition of North Carolina is 64.8% White, 21.6% Black, 9.4% Latinx, and all other race-ethnic groups account for 4.2% of the population. Figure 2.1 is a map of the dominant minority racial-ethnic groups by county.

We repurpose and fit the divergence index (Roberto 2015), a measure originally used to quantify racial segregation, to compare disparities in the proportion of testing and cases among different racial-ethnic groups compared to the proportion of the population for each racial-ethnic group per county. A value close to zero indicates no disparity and increasing values indicate greater disparities in testing and case counts. Figure 2.2 displays the divergence index of testing (a) and cases (b) by county for different racial-ethnic groups (White, Black, Latinx, American Indian). There were disparities in both testing and cases (i.e., positive tests) of COVID-19 in many counties of North Carolina. The highest disparities in testing were in a cluster of counties in the northeastern part of the state with large Black minority populations. There were counties throughout the state with high divergence index scores for positive tests including counties with high Black, Latinx, and American Indian minority populations. These results suggest a targeted need for equitable and expanded access to testing in areas of the state with historically marginalized minority populations.

Fig. 2.1 Dominant minority racial-ethnic group by county

Fig. 2.2 Divergence in testing (**a**), and in positive cases (**b**), by racial/ethnic group at the county level

5 Conclusion

As we learn more about SARS-COV-2 and COVID-19, spatial epidemiological theory and tools will constitute an important component of research and policy. From a public health policy perspective, considerations of spatial dependence and spatial interaction will be important to inform ongoing and future surveillance efforts, especially as blanket lockdown and shelter in place measures are lifted and replaced by localized place-based recommendations and restrictions based on COVID-19 re-emergence risk. Future intervention efforts, such as creating safer public spaces and workplaces, allocating appropriate surge capacity in hospitals during future outbreaks, and devising effective vaccination campaigns in an effort to achieve herd immunity, would require incorporating the spatial principles and methods discussed above. Since infectious diseases including COVID-19 heterogeneously spread through space and time, efforts to combat them will require a spatial epidemiological approach.

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Chapter 3
Disease Ecology

Sadie Ryan

1 Disease Ecology: An Overview

Disease ecology is a branch of ecology that provides a framing for the processes of disease transmission; using the backdrop of quantitative ecology, it differs from related disciplines such as epidemiology, in that specifying the system and mechanisms in the modeling approach is explicit. While epidemiology is traditionally defined as describing patterns of health states and events in a population, disease ecology generally describes the mechanisms and dynamics giving rise to those patterns. However, as Brandell et al. (2020) point out, disease ecology is a new and rapidly expanding research focus within ecology and evolutionary biology, integrating across many fields in biological science. Largely arising from foundational work in population models of diseases by Anderson and May (Anderson and May 1991; Anderson 1979), disease ecology has been expanding and changing, spanning theoretical and applied questions in human, animal, and plant systems, from zoonotic disease emergence, to crop disease impacts, to livestock outbreaks, to better understanding population immunological dynamics in wholly anthroponotic systems (Bradley and Altizer 2007; Chowell et al. 2008; Ezenwa 2004; Rahman et al. 2010; Taylor et al. 2019).

One of the classic approaches to modeling infectious diseases in disease ecology has been coined the "compartmental model." This is both a framing that is conceptual, in that the population transmission process is divided into compartments, which can be illustrated with flowchart notation, and also allows for different mathematical specifications to construct a model of the system. I will describe one of the basic versions here, the SIR model (Susceptible, Infected/Infectious, Recovered).

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This model arises from concepts in Anderson and May's early work and divides the population into three categories of infectious state, the compartments S, I, and R. These are connected by flow arrows, or rates at which conversion between categories occurs.

Box 3.1 SIR Modeling Basics
- For infectious disease spread within a population, we assume a starting point of a naive and uninfected population, Susceptible—S.
- As susceptible individuals contact infected individuals, and become infected, they transition to Infected, I.
- If we assume that Infected individuals recover from infection, have immunity to the infection, and do not die of the infection, they transition to the recovered class, R.

We refer to this as S-I-R progression, and the SIR model is a fundamental model in disease modeling. We assume a closed population, with no birth or death dynamics, and this leads to simple progression.

In this case illustration, we see that in a population of 100 individuals, the susceptible pool, S, is drained as it becomes infected, I, however, I transitions to recovered, R, also reducing I.

This means that the epidemic rises to a peak, and declines, and when and how high are determined by the rates of transitions between the three states in the population. These population transitions for a simple infectious disease system illustrate how epidemic peaks occur.

Box 3.2 R_0: The Basic Reproductive Number

In order to understand and even predict how a disease will progress through a population, deriving a measure of this spread that may be consistent across locations is important. How long are people infected for? How easily is it transmitted? These components of the rates may be similar, while the populations experiencing it may differ, leading to different epidemic outcomes. We thus use a measure called R_0, pronounced "R naught" by British English speakers, and sometimes called "R-zero" in the USA. This is defined as the average number of secondary infections that an infected host produces in an otherwise susceptible population.

R_0 is a threshold criterion:

If $R_0 < 1$, disease dies out
If $R_0 > 1$, disease persists

Bringing together our concepts for the compartmental model illustration on the process of an infectious disease moving through a population, and our threshold criterion for establishment and spread, R_0, we can use rate models as a function of time (t) to describe the movement of S to I and I to R, in terms of the transmission rate β, and the recovery rate γ.

Thus, R_0 is a function of β and γ, because you can infect β susceptibles, but only have $1/\gamma$ time in which to do it:

$$R_0 = \beta / \gamma$$

The system of equations for changes in infection status are:

$$\mathrm{d}S / \mathrm{d}t = -\beta SI$$
$$\mathrm{d}I / \mathrm{d}t = \beta SI - \gamma I$$
$$\mathrm{d}R / \mathrm{d}t = \gamma I$$

We express these rate equations as a system of differential equations here, treating the population as fixed (no birth or death events). Modifications of this system of equations can be introduced by adding density dependence, using proportions instead of counts, making this a time-stepped system instead, adding stochasticity in rates or population processes, and so on. This simple deterministic system is a basic frame on which to expand.

R_0 for common seasonal and pandemic flu ranges from 1 to 3, and more precise estimates have been obtained for historical outbreaks of influenza with well-documented records. The 2002 outbreak of SARS had an R_0 of 3, except in the case of "super-spreaders," which changed the dynamics of disease transmission considerably. The vaccine-preventable childhood diseases have very high R_0 values: measles 10–15, pertussis 16–18, and polio 8–12, underscoring the importance of maintaining population-level vaccination rates for these diseases.

The utility of a compartmental model, or a population dynamic approach, to modeling disease transmission is that health interventions can also be explicitly modeled, or simulated, to assess their impact. For example, modifying the encounter rate between susceptible (S) and infected (I) individuals by isolating infected individuals (e.g., lockdown, quarantines) will reduce the rate at which the population moves into the infected state. In the case of COVID-19, we have seen that hospital capacity has frequently been a concern, and simply slowing the rate of infected individuals needing those hospital beds was essential. These models also allow for assessing vaccination rates—in this case, individuals can move directly from the susceptible (S) pool to the recovered (R) pool, leading to a much lower number of individuals ever becoming infected, and with a sufficient rate of effective vaccination, transmission will die out. Expanded versions of compartmental models such as this have been used to explore intervention strategies throughout the COVID-19 pandemic.

A key feature of disease ecology is specific system description inherent to the analysis or hypothesis tested. For example, in a climate-driven vector-borne disease system, the model used to describe the relationship between climate and disease burden might be described statistically as a linear relationship, or correlation, between a component of the climate (e.g., temperature) and cases reported. This may be appropriate for certain values of the system (i.e., over part of a range of temperatures). The mechanistic model approach, however, would rather specify empirical relationships between climate variables and parts of the transmission cycle sensitive and agnostic to temperature and other variables-such as mosquito survival, reproduction, biting rates, parasite development rate, and human recovery-in order to specify the system, describe the ecology, parameterize it from first principles (i.e., specifying empirical relationships of system components), and build a system model and then validate it with data. In particular, ecological models allow disease ecologists to specify system nonlinearities, which can lead to important findings in the overall system, when confronted with real-world data. In this example of a vector-borne disease system, the relationship between temperature and transmission components is nonlinear, which we know from ecophysiological principles for organisms; if the organism, proteins in the organism, and enzymatic reactions driving the organism are too cold, the system will not start. At the other extreme of high heat, all of these will break down, so there are bounds, or thermal limits, to ecophysiological processes. This translates to a nonlinear relationship between components of transmission and temperature; and for mosquito-borne diseases particularly, the relationship between vector and parasite, and their combined life history responses, creates a unique vector-pathogen transmission curve for each vector-pathogen pair when closely examined with empirical data. The shape of that nonlinearity is best defined by fitting empirical data, collected in controlled experimental conditions; for more details on this approach, as applied to multiple vector-borne disease systems, see Miazgowicz et al. (2020), Mordecai et al. (2019), Ryan et al. (2019), and Shocket et al. (2018).

As COVID-19 spread throughout the globe, the relevance of disease ecologists in two particular foci came into recognition. Disease ecology, as the

interdisciplinary home of spanning multiple fields, has been concerned with assessing and addressing the ecology of emerging pathogens and diseases, through direct methods of outbreak detection (Bermejo et al. 2006; Leroy et al. 2004), describing and predicting processes leading to pathogen spillover (Daszak et al. 2000; Patz et al. 2000), and using evolutionary biology methods to trace spillover events and novel disease threats, such as using phylogenetics to demonstrate potential sources of pathogens in wildlife. The back-and-forth of early discovery in possible sources of spillover of the SARS-CoV-2 virus led to hefty debate about whether pangolins (Lam et al. 2020), bats sold for consumption in markets in Wuhan, China (Andersen et al. 2020), or another as yet undefined wildlife reservoir or spillover and adaptation in humans—and even speculation that this was a laboratory-developed strain—was responsible for sparking the pandemic. As the conversation shifted to targeting wildlife trade routes, and quickly led to outcry in conservation biology calling for wholesale wildlife trade bans, disease ecologists involved in viral spillover prediction were asked why they did not predict this particular pandemic; this echoed questions directed at scientists during the 2014 Ebola outbreak, which led to blame lodged at scientists predicting the spread incorrectly and "allowing" Ebola to spread. While research into SARS-like coronaviruses has been ongoing since the SARS spillover and outbreak in 2002, coronaviruses have remained a rather understudied group of viruses, and it wasn't until 6 years later that the origin of the 2002 SARS epidemic was attributed to spillover from bats. However, the pathway from bats to humans is still not definitively described as the viruses found in horseshoe bats are a family of viruses that likely gave rise to the spillover virus that triggered the 2002 SARS outbreak (Hu et al. 2017). A paper that traced SARS-CoV to civets in 2004 (Tu et al. 2004), via surveying animals in multiple farms and markets, noted that most civets on farms did not show antibodies, except those in one market in Guangzhou with about 80% antibody presence, suggesting that civets were catching and circulating the virus at the market, via overcrowding and mixing of various species there. This underscores the larger message from many disease ecologists that, while we cannot necessarily predict specific spillover events and pathogens, we can predict that they will occur. The ecology of the system of markets provides multiple different kinds of encounters—overcrowding leading to stress, animals experiencing nonhuman cross-species interactions, heightened transmission potential with humans, and experiencing multispecies interactions and potential for different transmission modes (e.g., respiratory, blood contamination, fecal-oral, consumption of uncooked or contaminated products); it is worth noting here that this wet market phenomenon occurs globally, and in the more industrialized animal food chains of the world, a similar set of multiple opportunities for exposures, crowding, increased stress, and susceptibility exists, leading to livestock disease mixing and domestic spillover events in the agricultural setting. Thus, from a systems perspective, disease ecologists are at the forefront of describing conditions conducive to spillover, leveraging wet lab bench tools to track and trace pathogens, and providing predictive modeling frameworks to guide and inform policy in the prevention and surveillance for emerging pathogens.

The other major role of disease ecology, which overlapped heavily with the role of epidemiologists and global health experts in describing the COVID-19 epidemic, was to provide models capturing transmission dynamics in a meaningful way to advise policy and intervention. COVID-19 saw the arrival of data-intensive on-the-fly web-hosted dashboards for visualizing data and modeling outputs; the rise of ArcGIS Pro dashboard tools, and large-scale visualization tools like Tableau, and R Shiny platforms transformed the way disease modelers could communicate with the public. While early enthusiasts fitted exponential curves to data, to show how rapidly the increases in case numbers were occurring, this provided a top-down means to describe the underlying mechanisms of spread in populations. The compartmental modeling approach was quickly adopted in many forms by multiple modeling teams to describe the underlying mechanisms—encounters between population components that might result in transmission, S-I dynamics fit to data to estimate force of infection or to capture R_0, and the basic reproductive rate of disease. From there, research teams tackled questions of interventions, of exceeding ICU capacity, of testing the degree of intervention, and of its reducing impacts to hospital capacity, human caseloads, and deaths.

As computational tools available to disease ecologists increase in efficiency, using ever more elegant algorithms and estimation, and the speed of processing through the available data increases, so we become more aware of the remaining gaps. It is hard to find a large-scale disease ecology study that does not conclude with a call for more data collection. This is a message that simply increases in proportion to the complexity of systems described. The gap in global surveillance of human infectious diseases is dwarfed by the gap in pathogen surveillance data availability for nonhuman animal and plant systems. COVID-19 has highlighted a need to fill these gaps, and we have seen a wealth of new modeling approaches to understanding potential spillover and spillback and redefining spillover boundaries in urban and agricultural landscapes. In addition, as disease ecology becomes better equipped to take on impacts of climate and land cover change, so the need for better descriptions of these at scales relevant to mechanisms of transmission increases. For example, we have a proliferation of satellite data available in near real-time, for multiple scales of observations—but it is still very complicated to describe the microclimate habitat needs of an individual tick at ground level, to incorporate that into a model of potential disease spread. In a time where we are recognizing that humans on landscapes are interacting with and transforming the ecology in ways that make us vulnerable to pathogen spillover, understanding the scale and mechanisms of these systems and describing them in useful predictive ways requires the tools of the disease ecologist and access to sufficient data to refine and validate models. Disease emergence and spread has shaped human history and the ecology of the planet, and will continue to, into the future. COVID-19 has emphasized the various roles that disease ecologists play in their interdisciplinary approach to understanding both the emergence and spread components of pandemics and how that approach can inform understanding for interventions and public health messaging.

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Chapter 4
COVID-19 and the Political Ecology of Global Food and Health Systems

Eric D. Carter and William G. Moseley

Political ecology is a useful lens for making sense of the global pandemic of COVID-19. With roots in geography and anthropology, political ecology originally set out to analyze the complex drivers of environmental degradation, hunger, and, more recently, infectious disease. In this chapter, we highlight the insights of a materialist (or structuralist) tradition in political ecology for understanding the processes of emergence and diffusion of COVID-19, as well as the construction of social vulnerability to infection and malnutrition. One of the most consequential side effects of the COVID-19 pandemic, risk of food insecurity and malnutrition, highlights political ecology's attentiveness to market structures, production systems, and supply chains, which are impacted by shocks like the COVID-19 emergency. We also draw on insights from a critical political ecology (or poststructuralist) tradition, which focuses on power, discourse, and the politics of knowledge. We close with thoughts on whether the COVID-19 pandemic will reshape the global economic and political order, including food and health systems.

Early political ecology exposed the limits of conceptualizing environmental change as an exogenous variable separate from human society (Blaikie 1985). The causes of environmental change could be found in the complex workings of the political economy at various scales. For example, in his early work in Northern Nigeria, Watts (1983) showed how famine was caused by neither drought nor population growth, which was the conventional wisdom of the time. Rather, it was British colonial policy, involving head taxes and a push for commodity exports, that had systematically dismantled systems of surplus grain storage and made Sahelian communities much more vulnerable to hunger in times of drought.

Trends in the political ecology of health mirror movements in the subfield more generally, with adoption of frameworks of "materialist" political ecology

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(based on Marxian political economy), later shifting under the influence of critical theory. The early work of Mayer (1996, 2000) on emerging infectious diseases emphasized how political-economic processes generate environmental change which, in turn, creates the necessary ecological conditions for the emergence of new viral threats. The origin story of COVID-19 fits this template, as the virus probably crossed over—in what is known as a "zoonotic spillover" event—from a nonhuman population of mammals (bats, most likely) into its first human hosts, in and around the wild animal markets of Wuhan province, China.

Nowadays, the link between environmental change and disease outbreaks is the focus of integrative, interdisciplinary research mostly outside of geography, involving specialists in microbiology and virology, animal ecology, evolutionary biology, and many other fields. Many of these efforts fit within the paradigm of One Health (or EcoHealth), which seeks to break down the barriers between medicine (for humans) and the sciences of nonhuman animals (like veterinary science and animal pathology) particularly to prevent emergence of new infectious diseases (Wilcox et al. 2004; Brisbois et al. 2017). Inter- or transdisciplinary research teams monitor the wildlife trade, resource frontiers, and other areas of intense environmental transformation, as a kind of sentinel system to spot and control outbreaks of new infectious diseases before they turn into global pandemics (Wolfe et al. 2007).

Alongside such efforts based on natural sciences, political ecology insists on the role that social difference plays in creating vulnerability to the spread of infectious disease. A pandemic like COVID-19 would seem, by definition, to be a universal phenomenon. However, as critical scholars of public health, like Paul Farmer, have explained, viruses spread along "international 'fault lines,' tracking along steep gradients of inequality" (Farmer 2001, p. 50), finding their way into vulnerable populations. It is as true as ever that "most human diseases relish the opportunities provided by human inequality" (Del Casino 2016). Examining the Ebola epidemic in West Africa, Wilkinson and Leach (2015) effectively weave together the perspectives of critical public health and political ecology. Centering the concept of "structural violence," they argue that the "Ebola crisis has emerged from the meeting of long-term economic, social, technical, discursive, and political exclusions and injustices, now shown to be dramatically unsustainable" (Wilkinson and Leach 2015, p. 137). Putting crises into broader political-economic contexts and tracing the historically deep roots of structural inequalities are intrinsic to the political ecology approach.

The relationship between ecologies of risk and social vulnerability in the COVID-19 pandemic is foreshadowed by research on the bird flu (avian influenza). Ecological conditions in industrial livestock facilities (such as the density, confinement, and genetic homogeneity of poultry flocks) favor the viral mixing and mutation that can lead to new, fearsome strains of the flu (Wallace 2016). While influenza and COVID-19 are different, it should be noted that meat processing plants in the USA have become COVID-19 "hotspots" not because the animals processed there are carriers of the virus, but rather because the close proximity and high contact between workers create conditions ripe for the spread of the virus. Classified in many states as "essential workers," and typically new immigrants (many undocumented), workers in meat packing plants—indeed, all along the commodity chain of

food production, processing, and service—have little control over their working conditions and fear recrimination for being absent from work (Hubler et al. 2020).

Thus, from a materialist political ecology perspective, prevailing conditions in the international political economy of agriculture and livestock help to shape the course of the pandemic. However, the reverse is also true, as the pandemic impacts the global food and agriculture sector, just as other public health crises, like the HIV/AIDS crisis in South Africa, have shaped the political economy of agriculture (King 2017). In April 2020, the Director of the World Food Programme warned that an additional 135 million people may face acute food insecurity by year's end (Khorsandi 2020). Thanks to the work of political ecologists and other development scholars, the reasons for rising hunger are now well-known. The loss of employment associated with COVID-19 lockdowns has meant that many cannot afford adequate food, especially in countries lacking robust social safety nets (Moseley and Battersby 2020). Rising airline transportation costs have made it harder to transit perishable food products, hurting producers in countries like Kenya that used to export vegetables to Europe (Clapp and Moseley 2020; Roussi 2020).

The current crisis is not a result of inadequate supplies of food; in fact, we are so awash in food that some producers are letting crops rot in their fields, burying hogs in mass graves, or flushing milk down drains (Corkery and Yaffe-Bellany 2020). Rather, decades of policy reform have led to a highly monetized global food system that is ever increasingly built on industrialized production methods, specialization, and trade—a system that is notably precarious in the face of COVID-19 (Clapp and Moseley 2020). The nature and structure of the current global food system were shaped by years of policy reform and programs that were discursively shaped and bankrolled by powerful actors, including input suppliers, agricultural processors, food corporations, philanthrocapitalists, and segments of academia that support the production agriculture approach (Sumberg 2017). The current crisis is the result not of an imbalance between food supply and demand but of historical processes like the first Green Revolution, which fostered industrialization of food production in the Global South (Patel 2013), Third World debt crisis, neoliberal economic reform, the end of food self-sufficiency policies, and increased commodity trading (Moseley et al. 2010). Such changes built a global food system that is highly vulnerable to trade disruptions, to disease outbreaks among certain populations of food workers, and to the loss of income from declining trade or lack of employment due to lockdowns. Perhaps not surprisingly, those growing some or all of their own food, relying on shorter supply chains, and planting diverse seed varieties have tended to fare better in this crisis (Moseley and Battersby 2020; Zimmerer and de Haan 2020).

To conclude, we see a few pathways for a research agenda on a political ecology of the COVID-19 pandemic. For one, political ecologists in the field should continue to build on existing strengths in analyzing the "social production of knowledge" (Brisbois et al. 2017; Jackson and Neely 2015) of COVID-19. The pandemic presents a new opportunity to analyze how health is regulated through individualized biopolitical practices and neoliberal (or "neuroliberal") rationalities (Guthman 2011; Carter 2015). Although there is no shortage of information on the COVID-19 pandemic—sure to be the best-documented outbreak in world history—there are

many questions left unanswered about the production and circulation of knowledge, through socially specific networks, at multiple and simultaneous spatial scales. Moreover, the conventional distinction between expert scientific knowledge and lay or community understandings of health and disease (Harris and Carter 2019) may no longer be the most salient point of tension. Clearly, official production and dissemination of knowledge about COVID-19 have become acutely politicized, in countries like the USA and Brazil. Under the assault of COVID-19, even critical political ecologists might find themselves on the side of public health officials whose views are grounded in Western scientific epistemologies, in fields like epidemiology and virology.

We are less sanguine about how political ecologists can contribute to modeling and prediction of disease outbreak and transmission. On the one hand, thanks to approaches like EcoHealth, biomedical scientists are more adept at thinking spatially and ecologically about complex health-environment problems. Yet, key specialized technical knowledge (in fields like virology, pathology, or infectious disease ecology) often lies beyond the skill set of political ecologists. Thus, it is more important than ever to foster inter- or transdisciplinary research collaborations, which includes a critical evaluation of epistemological stances, for example, according to the so-called KTA (knowledge-to-action) research framework that flows out of evidence-based medicine and the EcoHealth movement (Brisbois et al. 2017). Nonetheless, some political ecologists work effectively at the intersection of the social and physical sciences, combining a knowledge of ecology, disease, and political economy to analyze the roots of the COVID-19 crisis (Wallace et al. 2020). Given that this will certainly not be our last pandemic, political ecology could do more in terms of understanding the links between disease, industrial animal production, and political economy.

Finally, we note with optimism during these dark days that the COVID-19 pandemic may have unexpected consequences for addressing serious issues of global environmental change and social justice that lie at the core of political ecology's mission. In its praxis, political ecology has tried to envision a socially just and environmental sustainable future where society is organized around priorities other than economic growth, as expressed, for example, in the "degrowth" movement (Paulson 2017). Possibly, "Covid-19 shows degrowth is possible"; however, "the sudden, unplanned, and chaotic downscaling of social and economic activity" caused by the pandemic is a far cry from the conscientious and deliberate overhaul of societal priorities envisioned by the degrowth movement (Degrowth.info Editorial Team 2020). The pandemic has exposed the limitations of social organization based on the reign of the free market and individual consumer choice, as those countries with strong governments, collective institutions, and a well-developed sense of social solidarity have, arguably, fared better during the pandemic.

As has been widely reported, the temporary reduction of economic activities in many places due to the pandemic has had salutary impacts, for example, in terms of declines of greenhouse gas emissions. Food systems are also shifting toward more regional markets and shorter commodity chains. There has been a significant increase in community-supported agriculture (CSA) subscriptions in the USA, and

some farmers are now diverting their supplies to more local markets (Clapp and Moseley 2020). Many countries in the Global South are also beginning to rethink their agricultural policies and pushing for more food production at home. Although it is unfortunate that it took a pandemic to make it happen, we can now glimpse alternatives to intensive and extensive capitalist economic systems—possibilities that once appeared unrealistic now seem plausible. A return to "business-as-usual" after the COVID crisis, from the perspective of political ecology, is a political choice, not an unavoidable fate.

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Chapter 5
Setting a Death Trap: International Political Economy, COVID-19 Response and the Plight of Central American Migrants

Neil Hanlon and Catherine Nolin

1 Introduction

Political economy can take many different forms, but it is ultimately concerned to account for institutional assemblages of wealth, power and influence that exert major structural influences on the social and spatial distribution of (dis)advantage. Geography has a long-standing engagement with political economy as a means to account for uneven topographies of privilege, security and well-being. The recent experiences of pandemics such as Ebola, SARS and COVID-19 have reawakened interest in different forms of political economy as a means to 'scale up' health geography (Bambra et al. 2019; Hanlon 2016). International political economy (IPE) offers a conceptual means to help account for transnational networks, institutions and systems that exert considerable influence on the lived experiences of health disadvantage. In particular, IPE offers a means for health geography to be more attuned to scalar and relational aspects of identity, place and power.

An IPE outlook is widely used in the field of critical development geographies (Lawson 2007; Nolin and Stephens 2010; Power 2003). Here, there is a rich body of work concerned with the globalizing reach of neoliberal discourse and the ways in which powerful interests have been successful in inserting these discourses as a means to capture key institutions and systems of governance through policy and practice. Feminist political economy, additionally, pays attention to how ideas, interests and institutions are gendered (Werner et al. 2017). The unevenness of international relations highlights the degree to which policy and decision-making in so-called weak or failed states is often the outcome of pressures to appease powerful interests (e.g. political, industrial, financial) in the Global North, rather than to

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address material deprivation and systemic inequality. As Flood et al. (2020, p. 26) state, 'Profound global inequalities have certainly created the preconditions for a pandemic', and therefore such insights and perspectives are surely pertinent to all manner of global health concerns, including our interest in making sense of the extraordinary events of 2020.

2   COVID-19 and Central American Migration

The 2019 novel coronavirus outbreak (hereafter, COVID-19) is the latest in a series of recent pandemics (e.g. HIV, Ebola, SARS) that reveal the extent to which globalization has enabled the rapid spread of infectious disease, but likewise the means for coordinated transnational response. Such developments have led to burgeoning interest in global health outlooks (McCracken and Phillips 2017). What is often overlooked in such approaches, however, is consideration of how fears of infectious disease and pandemic can be used in the service of dominant interests. The United Nations' top humanitarian official recently stated: 'The COVID-19 pandemic and resulting recession are set to trigger the first increase in global poverty in three decades, pushing 265 million people to the point of starvation by the end of the year' (UN News 2020). COVID-19's devastation and the unequal distribution of harms within and across countries are devastating and predictable outcomes of policy choices (or inaction) by governments.

In this chapter, we employ an IPE approach to consider the plight of survival migrants from Central America seeking survival in the Global North at the time of COVID-19. Guatemalan academic Irma Alicia Velásquez Nimatuj (2018) sheds poignant light on why Central Americans, particularly Indigenous youth, flee north:

> They leave daily for whatever border permits them to escape, to breathe, and to leave the misery into which they have been born, and in which their parents and grandparents live, and who, despite working on fincas or industries, in cities or rural communities, have not been able to break the cycle of poverty. They leave because they want to break the curse that steals their dreams the moment they are born.

Migration must be understood as a highly politicized process involving the intersection of multiple social dimensions, including considerations of gender, class, 'race' and ethnicity (Bastia and Skeldon 2020; Nolin 2006). We examine three stages of migrant experience: detention, deportation and relocation. Each of these stages represents key moments in COVID-19 transmission that reveal the extent to which the discriminatory practices of various state actors put migrants and others at an elevated and cumulative risk of catastrophe. As Flood et al. (2020, p. 20) argue, COVID-19 exacerbates these challenges and presents as 'both a public health crisis and a profound human rights crisis'.

2.1   Spaces of Detention

Central American migrants seeking a better life north of the Mexican border have always faced barriers and restrictions, but these have intensified in recent years (Jones 2016). As documented by the Global Detention Project (2020), the USA operates the world's largest immigration detention system. Since the early 2000s, the US Department of Immigration and Enforcement (ICE) has established more than 110 facilities across 32 states and subcontracts with numerous other private facilities. This network of facilities is a central component of the US government's efforts to contain, control and restrict the flow of migrant applications to the USA. Such an elaborate institutional capacity should be seen in the wider context of efforts by wealthy societies to buttress their borders with the tools and practices of surveillance and security. While the world's most dangerous border crossings remain those guarding entrances to member states of the European Union, more recent political shifts in the USA have witnessed a sharp increase in surveillance and detainment of migrants seeking entry from throughout Central America and the Caribbean. This increased militarization of borders is regarded by IPE scholars to be a visible instance of structural violence imposed on residents of the Global South (Bastia and Skeldon 2020; Jones 2016).

More than 42,000 migrants were held in these facilities between October 1, 2019, and March 2, 2020 (Irvine et al. 2020, p. 442). While the US government reported a very low number of COVID cases in February, ICE confirmed more than 3000 coronavirus-positive detainees in detention by July (Kassie and Marcolini 2020) though testing remains limited. By holding migrants in these facilities, the US government created conditions ideal to the transmission of a novel virus. That is, migrants were held in densely populated facilities for weeks at a time, during which time detainees routinely interacted with each other. In such conditions, all it takes is one infected individual to spark an outbreak capable of affecting the vast majority of a facility population (including facility staff) in a matter of weeks (Irvine et al. 2020). Even as the increasing risk of COVID-19 transmission became apparent in the early months of 2020, US border authorities continued to order many thousands of migrants to be detained in these facilities.

2.2   Deportation Corridors

As criticism mounted about conditions in the detention centres, not to mention growing concerns that the ICE facility outbreaks might spillover to nearby communities, the US government ordered the mass deportation of detainees in April 2020. More than 6300 Central American migrants out of about 18,500 in custody were sent home within days of the order (Montoya-Galvez 2020). Many thousands soon followed. Most of the migrants were put on chartered planes in order to expedite their departure from the USA, with 60% of these flights bound for El Salvador,

Honduras and Guatemala (Kassie and Marcolini 2020). Airplane travel involves many potential exposures to infection, especially crowded airport terminals with few restrictions on interpersonal contact, not to mention the crowding and reliance on recycled air during the flight itself. Adding to the risks are the cumulative sources of stress incurred from weeks and months of detention, to say nothing of the despair of being ordered to return.

From the perspective of migrants' home countries, it was clear to all that these mass deportations posed a major risk of starting COVID-19 outbreaks. Governments throughout Central America and the Caribbean, however, were at a major disadvantage to oppose the manner in which these deportations were carried out. The president of Guatemala, for instance, tried on several occasions to delay or stagger the rate of migrant re-entry, each time prompting threats of visa sanction from US officials (Kassie and Marcolini 2020). Guatemalan officials then requested that flights contain no more than 25 deportees, but US officials refused to comply and regularly sent three to four times this number per flight (Perez 2020).

The manner in which the US government proceeded with COVID-19 deportations must be seen as the primary source of diffusion of COVID-19 to Central America (Finn et al. 2020; Kassie and Marcolini 2020). The actions of US officials led to the creation of very effective transmission corridors that greatly sped up the introduction of the virus to previously unaffected areas, often bypassing hierarchical nodes and introducing coronavirus to populations in smaller cities, towns and rural villages. While nowhere in the region has sufficient healthcare resources to handle COVID outbreaks, smaller centres are especially vulnerable. Hunger and extreme depravation are exacerbated, while medical and healthcare promoters are contracting COVID-19 at alarming rates (Krausch 2020).

2.3   Relocation Conditions

Returnees faced strict public health lockdowns on their return to places and regions of origin. Throughout the region, governments were quick to impose 'textbook' self-quarantining on those returning from abroad and later wide-scale physical distancing lockdowns for all residents. Upon arrival on a deportation flight, Central American governments are quarantining hundreds of deportees in centres at or near international airports, with limited supplies of food and medicines. Proving a challenge to manage, deportees are being released to travel home (often on crowded buses) to self-isolate. These actions posed a 'catch-22' scenario for returnees now faced with orders to self-isolate and practice strict physical distance (orders taken to appease wealthy trading partners) for weeks at a time in places where most people are without the means to forego wage income for more than a few days at a time (Masek 2020). Those who complied put themselves at heightened risk of food and medical insecurity and likely placed loved ones at greatly heightened risk of COVID-19 transmission. Those who did not comply faced an array of punitive

measures imposed by local officials and also likely accelerated the spread of coronavirus to the wider public.

This rather dire situation highlights the inappropriateness of adopting public health interventions and concepts developed by and for infection control in the communities of the Global North. Enacting such measures as though they were one-size-fits-all is illustrative of how global health expertise is prone to regard the world as a global village (Herrick and Reubi 2017). Such an imaginary ignores the very different conditions under which many in the Global South live day-to-day without security of income or social supports. Worse still, there is good reason to suspect that state actors in the Global South adopt policy tools and approaches for reasons other than a genuine concern for the well-being of its citizenry. IPE approaches to development studies, for instance, suggest that what motivates state actors in much of the Global South to import practices from the Global North is a desire to appear competent, compliant or otherwise 'legitimate' in the eyes of dominant interests such as wealthy allies, trade partners and foreign investors (Power 2003). Finally, it is no great leap of imagination to consider how 'physical distancing' and contact tracing directives align well with the interests of authoritarian-leaning governments throughout Central America.

3   Discussion

The biological aspects of a pandemic are rarely as discriminatory as its political dimensions. In spite of this, epidemiological models of infectious disease transmission, diffusion and containment are too often absent of any account of uneven relations of power and influence. By tracing the transnational pathways of contagion imposed on one particular marginalized group (i.e. migrants from throughout Central America seeking entry to the USA), we draw attention here to the promise and potential that IPE brings for a more nuanced geographical accounting of pandemic risk. We see quite clearly the pandemic geographies that Joseph Nevins (2020) describes as 'the division of global space that, in a world of great socioeconomic injustice, allocates life and death circumstances in a grossly unequal manner'.

The particular challenges of an imminent and widespread threat most certainly warrant coordinated transnational responses, but such scenarios are too easily exploited for the purpose of heightening rather than flattening the imbalances of power. With the particular kinds of responses to COVID-19 explored in this chapter, we have yet more instances of xenophobia and scapegoating masquerading as public health response. The arrival of COVID-19 in North America was quickly co-opted as a justification to deport migrant detainees en masse. Far from protecting US citizens from disease transmission, the manner in which migrants were detained at the border created ideal conditions for outbreaks of COVID to occur on US soil. The risks that such activities created for US citizens were only alleviated by a rapid and callous relocation of these 'infective' individuals to places scattered widely across Central America and the Caribbean, contributing to the WHO declaration in

late May 2020 that 'the Americas are the new epicenter of the global pandemic' (Finn et al. 2020, p. 7). Such actions, and the structural violence that underlies them compounded by colonial legacies (Lovell 2020), need to be prominently present in any narrative account of COVID-19's diffusion.

4 Conclusion

International political economy offers much needed insight about, and critique of, the uneven geographies of privilege and constraint operating in the global health arena. The present COVID-19 crisis is clearly an important opportunity to observe such uneven topographies of well-being as these operate in real time. Myriad other instances and intersections await further IPE attention. Is the international response to pandemic favouring undemocratic trends in both the Global North and Global South? How does a widespread crisis such as COVID-19 or climate change affect global political and economic institutions, including patterns of international aid, trade, debt and investment? Better still, how might IPE scholarship help bring about a decolonizing vision of the 'pluriverse' (Escobar 2018) and make space for grassroots, Indigenous, feminist and community-driven responses to global health and climate crises?

The extraordinary international reach of the COVID-19 pandemic necessitates greater attention to global processes. Scaling up is always an important part of the puzzle, and we tend to agree with the recent assertion by Bambra et al. (2019, p. 37) that '[p]lace matters for health, but politics matters for place'. That said, the strength of a human geography application of IPE is to continue to highlight the full extent to which global/local and micro/macro processes are interrelated and mutually constituted. It is through 'grounded' but scalar accounts of the ways in which power circulates in and through social networks that geographers must continue to offer antidotes to authoritarianism, oppression and inequity and platforms for the interests, experiences and abilities of marginalized groups to be conveyed.

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Chapter 6
Emergent Global Pandemic Risks, Complex Systems, and Population Health

Sarah E. Curtis

This chapter explores how understanding of complex systems may help to frame effective strategies of preparedness and response to the COVID-19 pandemic and similar threats to population health. The perspective discussed below may be relevant as contemporary societies struggle to address 'new global risks' to our health and wellbeing (Renn et al. 2019) including pandemics, economic crisis, and climate change. Theoretical perspectives on complex systems are diverse. I do not propose to review here all the different, sometimes conflicting, arguments presented in the wider literature. This commentary draws particularly on an interpretation reviewed from a geographical standpoint by Gatrell (2005) and applied in other literature on health and health care during crises (Curtis and Riva 2010; Curtis et al. 2018; Oven et al. 2019).

In relation to geographies of health and pandemics, complexity theory helps us imagine systems comprising elements, including diverse human populations, varying socio-geographical settings, health and social care services made up of many components, human connections via various forms of transportation and communication, and bioenvironmental processes generating risks of infection. This links to debates about the public health 'nexus': the connected network of environmental and human systems which underlie processes relating to public health and security, considered, for example, in relation to risks associated with infectious diseases including SARS (Dijkstra and De Ruijter 2017) (Table 6.1).

The 'emergent' nature of 'new' risks in complex systems is a key consideration. The idea of 'emergence' alerts us to the fact that these risks produce conditions that have not occurred before (at least not in exactly the same way) and are contingent

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Table 6.1 Characteristics of complexity as they relate to health system impacts of pandemics and possible actions for preparedness and adaptation

Aspect of complex system	Characteristics	Impacts on population health of pandemics		Possible actions to enhance preparedness/adaptation of health systems
		Beneficial	Detrimental	
Emergence	Events that are unexpected in nature/timing	Incentives to enhance capacities/resilience	Damaging risks for which system is not prepared or adapted	Invest resources and capacity to prepare in advance for adaptation to emergent conditions
Openness	Partial connectivity across different sectors of the system	Potential for exchange across the system of information/knowledge/ resources	Spread across the system of infection/ contamination	Incorporate flexible and adaptive controls over flows across the system and build capacity to raise barriers to infection
Closure	Separation/isolation of different parts of the system	Protection from infection/contamination by isolation and diversity of responses	Unequal access to resources and incomplete information/knowledge	Manage isolation strategies and strengthen supply chains of resources and knowledge across vertical and horizontal divides in social and organisational systems
Co-evolution	Parts of system change interactively over time	Herd immunity, better adaptation, and resilience to changing pandemic risks	Lack of diversity in resilience across the system may weaken overall survival prospects due to overdependence on single, cross-system solutions	Develop new immunity/protection strategies (e.g. vaccination/protective equipment/response and care systems) while maintaining capacity for diverse adaptation
Path dependency	Response to emergent events is influenced by past experience and existing intergenerational knowledge	Accumulation of knowledge and experience to draw upon during crises	Accumulated inequalities in resilience, rigidity/over-reliance on conventional strategies	Share and critically assess accumulated knowledge while addressing long-standing inequalities in capacity and resilience

upon local conditions (Herrick 2016). These aspects of emergent risks make it very challenging to anticipate and predict, in precise terms, when, how, and where such risks will occur and how they will unfold variably across a system.

However, complex systems do tend to have certain 'typical' attributes, which is important to consider if we are to build more effective risk management strategies. We can consider 'emergence' of new risks as one of these attributes, while others include path dependency, partial openness/closure, self-organisation, and co-evolution (Gatrell 2005). In general terms, for example, Renn et al. (2019) conceptualise 'global systems as involving an interplay between micro- and macrodynamics internal to the system, with the system simultaneously interacting with its environment. Such dynamics typically show periods of stability, punctuated by situations opening up several possible futures' (p. 401). This perspective emphasises that we need to be constantly aware that crises such as pandemics are a recurrent feature of the world that we live in. By recording, sharing, and processing information about such events, and by prioritising preparedness for new risks, societies globally could probably improve their capacity to respond effectively to instability and uncertainty associated with emergence.

Considered in relation to complexity of human responses to environmental change, the idea of 'path dependency' relates to how past experiences may influence the ways that we anticipate future 'emergent' conditions and how we respond to the risks they present. Historically, human responses to environmental risks (including pandemics) have been partly dependent on the cultural transmission of knowledge, between generations and amongst social groups, of practices that had been shown to be protective against such risks. Historical, anthropological, and socio-geographical perspectives emphasise knowledge gained through cultural and behavioural development of human societies over time. Also, at the more individual level, they illustrate the importance of a person's knowledge gained from experience of risks over their life course. These cultural processes are still very important in forming our present thinking about risk and resilience (Liritzis 2020).

Path dependency also matters for the generation of knowledge about 'new' risks that is produced through more scientific and clinical strategies for anticipating and responding to events such as pandemics. Our understanding of the COVID-19 pandemic is (at least potentially) based partly on observation of previous epidemics. Thus, to take just one example, a study in Hong Kong (Yu et al. 2017) examined ways that different hospital ventilation systems might affect the outcome of treatment of patients infected by Middle East respiratory syndrome coronavirus (MERS-CoV), severe acute respiratory syndrome coronavirus (SARS-CoV), and H1N1 influenza virus. The authors commented that their study '..should provide a useful source of reference for the hospital management to mitigate the risk of infection with MERS or other airborne transmitted viruses through better ventilation design strategies' (p. 154).

Contemporary scientific information systems are growing in scale, and methodological sophistication and capacity to generate information on population health and health care in real time is becoming quite well developed in some countries. These changes include advances in geographic information systems

(Boulos and Geraghty 2020). The growth in virtual communication systems can potentially allow harvesting of data, collected via cell phones, for geographical tracking of people infected by COVID-19, and those in close contact with infected persons, which may help to trace and control spread of the disease. In the UK, which has the National Health Service (NHS), anonymised administrative data are used by Public Health England to monitor, almost in real time, changing health-care use in the population. This is published in the form of weekly reports, through syndromic surveillance systems (GOV.UK 2020). At the time of writing, these were showing, at a country-wide level, how frequently key parts of the NHS, including general practitioners, emergency services, and online health advice systems, were responding to service demands associated with COVID-19. Predictive modelling of future pandemic developments in space and time is also becoming more sophisticated, as illustrated, for example, by the application of mathematical chaos theory to use data from China, Japan, Korea, and Italy to model scenarios for the development of the pandemic in other countries (Mangiarotti et al. 2020) and the application of 'space-time cube' methods to model the uneven spatiotemporal spread of COVID-19 infection in China (Mo et al. 2020).

These examples lead us to consider how understanding of the development of 'new' global pandemics and human responses are also being influenced by other 'typical' attributes of complex systems, which are important for our response to risk. The transmission of ideas and knowledge, as well as the communication of disease, should also be viewed through the concept of 'partial openness/closure'; some parts of complex systems are connected and interact, while other components are more isolated from each other. We must also consider the importance for population health outcomes during 'new' global pandemics of aspects of 'self-organisation and co-evolution'; elements of complex systems will react—often in combination with other parts of a system—to emergent conditions.

Closure can be protective, as illustrated by low levels of COVID-19 infection in many isolated rural communities. As a protective strategy, artificial forms of 'closure' have been introduced in response to COVID-19 through measures such as lockdown and social distancing strategies, imposed by law and order mechanisms in many countries across the world. However, we are also seeing how closure needs to be combined with connectivity and information exchange through various systems. These include (but should not be limited to) virtual communication. The UK, for example, illustrates the challenges of controlling the pandemic using 'closure' strategies, since different countries within the UK have experienced varying timing and trends in infection rates, so that governments in England, Scotland, Wales, and Northern Ireland have imposed social distancing restrictions at different times, and in different ways, across the whole national space. These measures were responsive to geographical variation in the pandemic but created the potential for confusion amongst the general public about which rules applied to whom and in which part of the nation as a whole.

The importance of safe 'closure' to avoid spreading the infection was also underlined by relatively high rates of mortality from COVID-19 observed in care homes for elderly people in the UK. This partly reflects the greater vulnerability of

the residents, being older people, and often already in poor health due to other medical conditions. However, the statistics may also reflect challenges in achieving safe processes of entry into care homes during the pandemic for new residents who had been discharged from hospital or had been living at home. Government advice on measures to monitor infection amongst new admissions and prevent transmission amongst care home residents in the social care sector was undergoing continuing review at the time of writing.

In conclusion, we see from these examples that 'closure' to achieve isolation of infected individuals requires carefully managed 'openness' between different parts of the health and care sector in terms of communication of medical information about individuals at risk who are passing through the system. Thus, the complex interplay of closure and openness can be seen to be crucial to 'self-managing' processes in different parts of the system to allow effective 'co-evolution' of response during a pandemic and of public health planning in the longer term.

The examples discussed above give a very selective picture of the significance of complexity for our response to the COVID-19 pandemic. They do, however, illustrate the potential and limitations of predictive statistical modelling and advance warning as a basis for response to new global risks. We need to share and act upon a wider range of observations and knowledge of various types and from diverse sources. Although human systems are constantly evolving to enhance mechanisms that help to prevent global risks, it is unlikely that preventive measures alone can protect us from new global risks. We need to develop strategies of preparedness to help us expect the unexpected and to enhance our capacity for adaptation as well as prevention.

The discussion above also suggests themes for future geographical research. For example, ideas of openness and closure may help to frame research on patterns of interaction between individuals and organisations observed over space and time and how these have related to development of the pandemic. Themes of co-evolution and path dependency are relevant to studies of change in socio-geographical behaviour in response to varying experiences of the pandemic in different settings and how socio-economic and environmental inequalities have related to the variable impact of the pandemic.

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Chapter 7
Eight Centuries of Epidemic and Pandemic Control

Matthew Smallman-Raynor and Andrew D. Cliff

1 Introduction

Lockdown. Self-isolation. Social distancing. These are intrinsically geographical expressions that have come to evoke the global effort to control the first pandemic wave of COVID-19. Many of the defining characteristics of COVID-19, and the causal virus (SARS-CoV-2), have yet to be confirmed. But, eventually, the disease will be pinned down in its infectivity, its morbidity and its mortality to lie somewhere along the lengthening sequence of plagues and pandemics that have swept through human populations over the centuries. Confronted with a disease agent to which the human population has little or no immunity, three approaches to control may be employed: (1) allow the agent to spread so that natural herd immunity is established among the survivors; (2) separate the susceptible and infected components of the population by isolation or quarantine; and (3) develop and deploy safe, effective vaccines and treatments. This chapter examines how these responses to disease control have evolved historically and how approaches that were first developed and implemented in medieval times have been adapted to a twenty-first-century pandemic. Methodologically, the chapter sits in that part of medical geography which has come to be called spatial epidemiology, 'studies of disease causation and prevention which adopt a distinctly analytical spatial perspective' (Thomas 1990, p. 1).

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2   The Underpinnings of Disease Control

Figure 7.1 shows a simple model of the spread of an infectious disease in a human population. The population is divided into three sub-populations: those at risk of infection (susceptibles, *S*), those who are infected (infectives, *I*) and those who have recovered from the infection (recovereds, *R*). Propagation of an epidemic occurs by mixing between the *S* and *I* sub-populations. This generates new cases by the transition *S*⇒*I*. Once an epidemic has begun, its continuation is dependent upon the presence of a sufficiently large *S* sub-population for transitions of the type *S*⇒*I* to be uninterrupted and, hence, for community transmission to be maintained. The size of the *I* sub-population falls as those infected either recover, *R*, or die, while the *S* sub-population is renewed by births into the population.

Control of an infection can be undertaken at two points in Fig. 7.1. The first approach, labelled (i) in Fig. 7.1, is inherently geographical and involves the breaking of chains of transmission by interrupting the mixing of the *I* and *S* sub-populations through the establishment of protective spatial barriers. Such barriers range from the highly local (social distancing and individual isolation), through community isolation and quarantine, to the imposition of regional or national restrictions on movement via 'buffer zones' or *cordons sanitaires*. As discussed in Sect. 3, these geographical approaches to disease control can be traced back to medieval times. The second method of interrupting the chains of infection, labelled (ii) in Fig. 7.1, is to short-circuit the route from the *S* to *R* states by creating

Fig. 7.1 Interrupting chains of infection. Alternative intervention strategies based on (i) a *spatial strategy*, blocking links by isolation and quarantine between susceptibles and infectives, and (ii) a generally *aspatial strategy*, opening of new direct pathways from susceptible to recovered status through immunisation. This outflanks the infectives (*I*) box. (Source: Cliff and Smallman-Raynor (2013, Fig. 1.19, p. 15))

population immunity through immunisation. Immunisation is commonly achieved today through the use of vaccines and may, prima facie, be viewed as an aspatial control strategy. However, as a means of epidemic control, immunisation is usually geographically directed to achieve optimum results. This strategy evolved from the late eighteenth century and is discussed in Sect. 4.

3 Spatial Strategies

Intrinsically spatial approaches to epidemic control can be traced back to medieval times and the repeated waves of plague activity that followed on from the great pandemic of Black Death (1346–1353) in Europe. The first landmark moves against the disease were taken by the Republic of Ragusa (modern-day Dubrovnik, Croatia). On July 27, 1377, the city's Major Council passed a law which stipulated that 'those who come from plague-infested areas shall not enter [Ragusa] or its district unless they spend a month on the islet of Mrkan or in the town of Cavtat, for the purpose of disinfection' (Tomić and Blažina 2015, pp. 106–7).

3.1 Italy and the Plague Centuries

The subsequent fight against plague was led by a group of states in northern Italy (Venice, Milan and Genoa). Venice itself became the focus of developments, establishing in **1423** an island hospital (Lazzaretto Vecchio) in the centre of the lagoon—**the first in the world**—for the treatment of plague-infected people and the **de**contamination of goods. The hospital was designed so that each patient had a separate cell; adjacent gardens were used for food production to complete the isolation. The system became overwhelmed during major epidemics, but the basic ideas of isolation, on-site food production and overwhelmed facilities in plague years have their echo today in the approach of many countries to the COVID-19 pandemic. In the UK, for example, isolation finds its parallel in shielding and 14-day self-isolation, while the slogan 'stay at home, protect the NHS, save lives' speaks to preventing the overburdening of the National Health Service's facilities and resources.

From thereon, Italy's northern states gradually evolved a system of public health which, by the mid-1600s, had reached a high degree of sophistication. First, echoing Ragusa, ships arriving in their ports from infected areas were required to sit at anchor for 40 days (*quaranta giorni*, a practice from which the term 'quarantine' is derived) before landing. Second, the states devised a system of health magistracies which had, as their prime focus, the prevention of plague. Underpinning the system was surveillance and interstate communication. During the sixteenth and seventeenth centuries, these states established the custom of regularly informing each

other of all news they had gathered on health conditions prevailing in various parts of Italy, the rest of Europe, North Africa and the Middle East (Cipolla 1981).

To assist in surveillance at the local level, there emerged the ubiquitous plague doctor who, COVID-like, wore his own personal protective equipment (PPE). Introduced in 1630, the protective suit consisted of a light, waxed fabric overcoat, a mask with glass eye openings and a beak-shaped nose, typically stuffed with herbs, straw and spices. Social distancing was facilitated by a cane that permitted the plague doctor to examine patients without the need for direct contact, while detailed records of plague-infected individuals, their dwellings and contacts were maintained in a medieval version of 'track and trace'.

3.2 International Sanitary and Health Regulations: The 'Quarantine Diseases'

The modern international development of the Italian ideas of quarantine began with the International Sanitary Conferences which took place from 1851. Their work came to fruition at the World Health Organization's (WHO's) First World Health Assembly in 1948. The Assembly devised a single code (WHO Regulations No. 2, 1951) based on modern epidemiological principles which provided an adaptable international instrument to deal with the sanitary conditions to be maintained and measures to be taken against the so-called quarantine diseases (cholera, plague, smallpox, typhus fever, yellow fever and, subsequently, relapsing fever) at seaports and airports open to international traffic.

3.2.1 The International Health Regulations (2005) and COVID-19

Faced with the global health challenges posed by new and re-emerging infectious diseases in the late twentieth and early twenty-first centuries, including contemporary concerns over SARS and the highly pathogenic H5N1 avian influenza, the WHO issued a fully revised set of International Health Regulations (IHR) in 2005. These ushered in a new global public health surveillance regime that requires member states to notify the WHO of *all events which may constitute a public health emergency of international concern* (Article 6.1)—whether naturally occurring, intentionally created or unintentionally caused (World Health Organization 2008, p. 1). It was on the basis of these regulations that, on January 30, 2020, the Director-General of the WHO declared the COVID-19 event to be a public health emergency of international concern—an event that constituted a public health risk to member states and which required a coordinated international response. At this time, the WHO deemed it:

> …still possible to interrupt virus spread, provided that countries put in place strong measures to detect disease early, isolate and treat cases, trace contacts, and promote social

distancing measures commensurate with the risk (World Health Organization 2020, unpaginated).

These measures have formed the backbone of control responses by the WHO member states.

4   Vaccination: The Evolution of a Control Paradigm

A safe and effective vaccine is one of the holy grails of the current global COVID-19 research effort. In the absence of such a vaccine, Fig. 7.1 indicates that the world will remain largely reliant on spatial control methods to limit the geographical spread of COVID-19. Vaccination has been used as a means of controlling an expanding list of infectious diseases since the late eighteenth century. While practices analogous to the process of conferring increased resistance to infection ('immunisation') can be traced to antiquity, the modern history of vaccines dates to the late eighteenth century and local knowledge from the southwest of England that dairy farm workers who contracted cowpox were immune to smallpox. It was the English physician, Edward Jenner, who studied and promoted the prophylactic powers of cowpox. On May 14, 1796, Jenner vaccinated James Phipps with a material obtained from a pustule on the hand of a milkmaid. Six weeks later, he attempted, without success, to infect Phipps with pus from a smallpox patient. After 12 more successful vaccinations, he privately published a report of his findings and a new epoch in disease control dawned (Fig. 7.2).

4.1   Vaccination, Critical Community Size and Disease Control

As noted in Sect. 2, once an epidemic has begun, its continuation is dependent upon the presence of a sufficiently large S sub-population for transitions of the type $S \Rightarrow I$ to be uninterrupted (Fig. 7.1). Individuals who are immune act as a barrier to spread, slowing or preventing the transmission of disease to others. Immunity can be acquired after infection with a disease agent or by vaccination. It follows that vaccines can be used to reduce the S sub-population, raise the R sub-population and effectively force an infectious disease out of a community or geographical area.

4.1.1   Vaccine-Preventable Diseases and the WHO-EPI

The global eradication of smallpox, formally announced by the WHO in December 1979, was one of the outstanding successes in the control of vaccine-preventable diseases. Then, policy advisors to the WHO looked for a successor to the smallpox eradication campaign. Representatives from industrialised countries, particularly

Fig. 7.2 Timeline of vaccine developments and the introduction of vaccines in the UK. BCG (Bacillus Calmette-Guérin) tuberculosis vaccine. Hib (*Haemophilus influenzae type b*) vaccine. MMR (measles, mumps and rubella) combined vaccine. DTaP (diphtheria and tetanus toxoids and acellular pertussis) vaccine. IPV (inactivated poliovirus vaccine). Td (tetanus and diphtheria toxoids) vaccine for adults. DTaP/IPV, DTaP/IPV/Hib and Td/IPV are combined preparations. (Source: Cliff and Smallman-Raynor (2013, Fig. 4.4, p. 104))

those from Europe, were now seeing the results from their own immunisation programmes against a variety of vaccine-preventable childhood diseases and urged that these diseases be made the new WHO target area. The resolution creating the Expanded Programme on Immunization (EPI) was adopted by the World Health Assembly in 1974, with the initial aim of targeting six vaccine-preventable diseases (diphtheria, measles, pertussis, poliomyelitis, tetanus and tuberculosis) for a substantial reduction in global incidence. Programme policies of the EPI were formalised by the World Health Assembly in 1977. It was at this time that the twin goals were set of (1) providing immunisation services for all children of the world by 1990 and (2) giving priority to developing countries.

When the EPI began, vaccine coverage for the initial six EPI target diseases was around 5%. From this low baseline, immunisation services in developing countries were extended to almost 80% of children (aged <1 year) by the mid-1990s. Nevertheless, some 34 million children were being born each year in the poorest areas of the world which lacked adequate immunisation programmes. In response, new programmes have been developed to increase vaccine coverage—including the Global Alliance for Vaccines and Immunization (GAVI) and the Global Immunization Vision and Strategy (GIVS)—as a contribution to achieving the United Nation's goal to reduce childhood mortality. A number of remarkable

developments have followed, including the substantial global retreat of wild polio-viruses under the Global Poliomyelitis Eradication Initiative (GPEI) and the elimi-nation of indigenous measles in the Americas (Doherty et al. 2016).

4.2 Opposition to Vaccination

Social and political opposition to vaccination (and immunisation more generally) emerged soon after the development and standardisation of smallpox vaccination practices and protocols (Smallman-Raynor and Cliff 2012). In England and Wales, the Vaccination Act of 1853 and associated legislation mandated the compulsory vaccination of children against smallpox. This prompted the rise of opposition movements such as the Anti-Compulsory Vaccination League (later, the National Anti-Vaccination League) that objected to vaccination on political, medical and reli-gious grounds. Although the laws on compulsory vaccination in England and Wales were relaxed at the end of the nineteenth century, anti-vaccinationist sentiment con-tinued to cast a shadow over smallpox control in the decades that followed (Rafferty et al. 2018).

Unfounded or unproven health concerns have occasionally prompted public anx-iety over vaccines, as illustrated by the controversy over the combined measles, mumps and rubella (MMR) vaccine in recent decades (Cliff and Smallman-Raynor 2013). In anticipation of the development of SARS-CoV-2 vaccines, a number of anti-vaccinationist narratives have already begun to develop around such issues as vaccine safety, conspiracy theories, alternative medicines and cures (Johnson et al. 2020). Such developments have the potential to hamper efforts to exert effective control of the virus as an when a safe and effective vaccine is rolled out.

5 COVID-19 Control

The epidemic model in Fig. 7.1 has led to the frequent use of two terms in the UK government's daily briefings on the COVID-19 pandemic:

1. **The basic reproduction number, R_0.** This is defined as the average number of new infections caused by a single infected individual in an entirely susceptible, infinite population. In the terms of Fig. 7.1, this number is estimated from the rate at which new cases, I, occur and the rate at which patients, R, recover. If this ratio exceeds unity, the occurrence of new cases exceeds the recovery rate and the epidemic will burgeon. On the basis of the international experience of COVID-19, the new virus appears somewhat more infectious than pandemic influenza, but substantially less infectious than common childhood viruses like measles and mumps.

2. **Herd immunity**. This occurs when the proportion of individuals in the population that have acquired immunity to an infectious agent (either through natural exposure or vaccination) is sufficiently large that transitions of the type $S{\Rightarrow}I$ are interrupted and community transmission ceases.

A multinational study by Kwok et al. (2020) suggests that 60–80% protective immunity is needed to establish herd immunity to SARS-CoV-2 in a population. The achievement of such levels of herd immunity by natural means would have major ramifications in terms of morbidity and mortality and is deemed to be politically untenable in most countries. Under these circumstances, the best hope rests with a safe and effective vaccine. Vaccine development is a slow process, and it is possible that no efficacious vaccine can be found. All this implies that SARS-CoV-2 will remain a significant public health threat for some considerable time, even for the foreseeable future. Until a vaccine (or an effective treatment) is available, variants of the spatial strategies that evolved in medieval times—including social distancing, isolation, quarantine and lockdown—will remain the major means of COVID-19 control. These strategies will be supplemented by enhanced surveillance regimes, including contact tracing as exemplified by the 'Test and Trace' programme in the UK.

As discussed in Sect. 3, the IHR (2005) are the principal legal instrument for international disease response by the WHO. The extent to which the Chinese government followed the requirements of the Regulations, and provided the WHO with timely notification of the initial outbreak in Wuhan in late 2019, will be one focus of the forthcoming independent international evaluation of the WHO's handling of the pandemic. Similarly, the reaction time of the WHO and the delay in characterizing the COVID-19 event as a 'pandemic' (March 11, 2020) will also be examined. By the time that COVID-19 had been declared to be a pandemic, the disease had been documented in 114 countries, territories and areas, and the associated case count had exceeded 118,000. Given that community circulation had already been established in many countries, the apparent lack of a coordinated global response will also be under close scrutiny.

COVID-19 is now deeply embedded in the global population. Even with a highly effective vaccine and a determined roll-out, it is unlikely that it would be biologically plausible to eradicate SARS-CoV-2. Even if the virus could be eliminated in the human population, the threat would always remain of a reintroduction from its putative animal reservoir. On this basis, the world will have to face the prospect of controlling COVID-19, by whatever measures are available, in the decades to come. By defining our examination in terms of a spatial epidemic model, we hope that a clearer picture of what can and cannot be achieved, and how, has emerged.

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Chapter 8
Humanism and Social Constructionism

Jamie Baxter

1 Introduction

What does somebody who studies the social construction of risk in communities living with wind turbines have to offer our understanding of the COVID-19 pandemic? In this chapter, I will highlight a few theoretical and methodological touchstones, but with a view to pushing the boundaries by adapting and transforming them for a COVID-19 world. Academically speaking, I 'grew up' a health geographer. As such, I work outside the biomedical model to understand the broader determinants of health; the 'upstream' social phenomena entangled, for example, with such health-damaging hazards as poor diet, lack of exercise, stress and carcinogens; as well as the downstream impacts. I have watched social construction at work in my own discipline as 'medical geography' transformed in both name and substance over the last few decades, taking a more humanist and cultural turn and digging deeply into the concept of place including the therapeutic aspects (Kearns and Moon 2002). More recently, Andrews (2019) has urged us to move beyond the human, a natural expansion to include non-human and non-representational aspects of a global world struggling to sustain itself.

Humanism in practice is messy, emotional work well-suited for understanding the 'whys' of everyday experience (Pile 2010). For my part, I set about studying the everyday experiences of people living near potential technological hazards—landfills, PCB incinerators and pesticides—the conceptual focus being the social construction of risk (perception of threat), social conflict, stress, coping and environmental justice. Contrary to the critique that humanism is voyeuristic, my

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goal has always been to positively change policy by empathetically conceptualizing and telling the stories of the most directly impacted residents.

Methodologically, my students and I have interviewed and guided focus groups with hundreds of people. Technologically, I have transitioned from cassette tapes to digital audio recording and only recently to webcams. Taking a grounded face-to-face approach, we have experienced first-hand the outrage, despondence and tears, mixed with yelling, arm waving, finger pointing, crossed arms, rolled eyes and laughter associated with these lived experiences. This methodological practice of closeness underscores and reminds that our capacity as sensing bodies, with a wealth of shared social experiences, able to process a multitude of social signals in an instant makes us one of the best social research instruments. Something is lost in our 'physically distanced' transition to Zoom and Skype, but much can still be sensed remotely, bodies still have language from the shoulders up, and these technologies can be leveraged for a differently enriched interview/focus group experience—'Would you be comfortable walking with your laptop to show me?' (see Trussell et al. 2019).

While the predominant approaches to addressing the COVID-19 crisis are appropriately biomedical, major roles for humanists include understanding compliance with public health measures and the ancillary impacts of such compliance. That is, humanists should be interested in the social impacts of the disease including the experiences coping with quarantine, loss, social stigma and death, but also the positive aspects of resiliency, problem-solving and support. We should add to recent social scientific work on pandemics like H1N1 (e.g. Sparke and Anguelov 2012) and SARS (e.g. Affonso et al. 2004). However, COVID-19 is significantly different in terms of the scope of its spread, the extent of public health measures and the technologies being used to fill gaps in our everyday lives. It is in this context that Castree et al. (2020, p. 413) urge humanists to pay heed that the 'mind-opening potential of the [COVID-19] crisis should surely not be squandered'.

2   Humanism

Humanism is a broad approach to understanding that puts interpretation and the perception of meaning at the centre of enquiry by engaging with such philosophies as hermeneutics and phenomenology. Humanists use an empathetic lens on everyday experiences, particularly those of the marginalized 'Other' (Dyck 2005), the microworlds which include bodily states (e.g. of fear, pleasure and grief) (Andrews 2019; Pile 2010). Humanists often use ethnographic methods particularly those that directly engage with the fact that we are self-aware and use language to help us understand multiple possible meanings. As social beings, we read between the lines of texts (Tuan 1979).

Humanists explore intentions and actions (agency), what motivates those intentions and actions and what intervenes to prevent intention from manifesting as action (Buttimer 1990). This forces us to think about rationalities beyond scientific

ones, whereby laypeople question scientific assessments by taking actions that are contrary to expert advice (e.g. wearing masks, vaccinations). Yet, those same actions have their own rationality, an internal and socially sanctioned reason and logic of their own. Thus, public health benefits from understanding how groups are socially organized to be high or low risk. Increasingly, such groups are communities of interest—coalescing in virtual environments supported by online social media which further underscores the potential for new, virtual avenues for enquiry.

Humanistic studies though have been criticized for being small *n* studies—providing rich texture about a few people leaving us to wonder about the generalizability or transferability about any novel conceptual insights. Two responses from humanists are on the one hand explanations about how sampling (e.g. maximum variation) can lead to generalizable insights and on the other hand a view that generalizability is not the goal rather it is the conceptual depth itself. Indeed, the complementarity of approaches (e.g. humanist, post-positivist) has spawned a boon of mixed methods research in the last few decades, whereby new conceptual insights are explored with generalizable quantitative enquiry.

Conceptually, what is old is new again, if we think about the COVID-19 pandemic in terms of shifting landscapes of fear, conflict or therapy. The plethora of expertly sourced websites offering up to the minute COVID-19 infection maps highlights that the disease, though global, has a patterned spatio-temporal unevenness (Castree et al. 2020). This harkens Tuan's (1979) notion of landscapes of fear and potentially renews interest in his ideas about crowding, privacy and stress—not necessarily of the city, but certainly within the home. By contrast, Tuan also referred to the positive aspects of place the kind of thinking that urged researchers like Gesler and Kearns (2005) and Williams (2002) to develop ideas about therapeutic landscapes—places that heal spiritually, emotionally and thus physically. How are spaces of human 'contact' therapeutic in the COVID-19 context?

3 Social Constructionism Stress and Coping

Social constructionism embraces the idea of multiple meanings—that is, that the same set of facts or 'text' (very broadly defined) can be interpreted differently—relevant for the communities of interest mentioned above. In the area of risk analysis, a key learning from this basic notion is confirmation bias, that people will act if expert advice aligns with in-group political, ethnic and cultural thinking. This has spawned an unprecedented era of 'fake news'. Some 'news' is indeed wrong, not based on fact, but in other cases, there are slightly more subtle forces at work—echo chambers of like-minded people and media, which can complicate managing a public health crisis like COVID-19. Social constructionists have nevertheless been criticized by (post)positivists that this amounts to anarchic relativism—that every interpretation somehow matters. However, the social constructionist defence of multiple interpretations does not mean that all interpretations are defended as legitimate, quite the opposite. Rather, we urge that the roots of such interpretations

should be understood to create effective risk reduction strategies that resonate. This may mean appealing to in-group leaders to help tailor public health messaging. The challenge is that partisan politicization of behaviours like mask wearing can be deeply entrenched (Sanders et al. 2020). In fact, this is a common critical theorist critique of social constructionism, that we are too naïve about the structural under-pinnings of behaviour—e.g. partisan politics, racism, gender roles and capitalism. Indeed, social constructionists have taken on such explanation to the point that paradigmatic/methodological lines are now often very blurry.

Conceptually speaking, the stress, coping and risk literatures from public health and hazards research provide concepts and frameworks for a deeper understanding of behaviours under COVID-19. The stress and coping literature highlights that while fear can be a motivator for behavioural change, a perceived lack of control or capacity can increase the stress response (Van Bavel et al. 2020). Humanist social constructionists might better understand the nature of that stress and provide insights into minimizing it. For example, households who buy groceries in person using protective measures may have very different experiences from those who buy home-delivered groceries online. How does coping with grocery shopping relieve or exacerbate grief, stress, isolation and loneliness (Brooke and Jackson 2020)?

The social construction of risk literature also highlights that we have a built-in optimism bias; our default perception tends to be that bad things happen to others not us. While this helps mitigate stress, it also explains riskier behaviours. Roger Kasperson et al. (2012) more broadly conceptualize risk as a continuum in their social amplification of risk framework. They identify the intersection of events, information flows, interpretation and response that can cause groups to amplify risk (heighten threat responses) or attenuate risk (lessen threat responses). Those caught up in risk amplification may be paralysed by fear under COVID-19 and excessively socially isolate, while those caught up in attenuation may only minimally practice health protective measures (Sanders et al. 2020). Not only will each group likely have different practical and emotional experiences, but they will tend to need a different set of messages to ensure compliance with health protective measures while minimizing undue stress.

4   Humanizing Enquiry: Addressing Intolerance and Inequality

In times of pandemics, 'out-groups' are often further marginalized. With uncertainty and stress, we tend to look inward, to become more ethnocentric (Van Bavel et al. 2020). Kearns (1996) writes about the 'othering' of those stigmatized by HIV and AIDS urging us to add more embodied, personalized approaches to enquiry. Wilton's (1996) account of nine men living with AIDS in the 1990s in Los Angeles is spatial but in a very different way—he underscores how embodied disease within

networks of social relations cause everyday worlds to expand and contract in both positive and negative ways.

Various forms of inequality may be exacerbated, whereby some groups may have low ability to shelter in place (e.g. homeless), physically distance (e.g. those reliant on public transportation, institutionalized populations), restructure time-space at home (e.g. single parents with young kids) or get COVID-19 tested (e.g. those without health insurance). Beck suggests that global hazards like nuclear radiation and pandemic viruses are great equalizers in the sense that we are all vulnerable at some level. Yet inequalities remain, and in most contexts, they are exacerbated. The pandemic has held lending rates at all-time lows to stimulate recovery, a situation that mainly advantages the relatively wealthy whose white-collar jobs continue under COIVD-19 and have allowed them to purchase goods and real estate at record rates (Buheji et al. 2020). The transition to intensifying our goods-based economy at the expense of our service-based economy financially impacts those already at the margins, those oftentimes holding multiple jobs in the service sector. Those who are most vulnerable are typically the first and most seriously impacted by pandemics, particularly when economic, gender, racial, health, ethnic and age vulnerabilities intersect.

Institutions for the elderly, particularly long-term care homes, are especially high risk, and the public health response of sending seniors 'home' has further social implications. Sparke and Anguelov (2012) highlight four types of inequalities from the 2009 H1N1 pandemic worthy of attention: (1) inequalities in blame for the outbreak in the media, (2) inequalities in risk management, (3) inequalities in access to medicines and (4) inequalities encoded in the actual emergence of new flu viruses. Affonso et al. (2004) reinforce these ideas in a study of SARS in Toronto. They suggest further attention to inequalities of quarantine particularly when the disease clusters in marginalized communities simply because of the nature of their social and structural networks.

More humanizing efforts also emerge in pandemics, whereby multifaith, multi-racial demonstrations are held to reaffirm racial and ethnic solidarity—looking beyond existing tensions to minimize the spread of COVID-19. Indeed, there is generally much altruism in the face of disaster, with media and social networks reinforcing acts of kindness and congratulating everyday 'frontline worker' or 'heroes' including previously unsung ones like those in the food supply chain. Humanists might explore these tensions— e.g., how interactions between racial groups play out in such contexts, interviewing and observing demonstration participants to understand the lived experiences as they unfold.

5 Conclusion

Humanism and social constructionism put agency, interpretation, meaning and everyday life front and centre as a complement to work in the positivist biomedical and critical social sciences. In the COIVD-19 era, there may be opportunities for

transformative leaps forward as urged by Castree et al. (2020), but I suggest these can to some extent be built on the conceptual foundations we already have. Though COVID-19 no doubt shares themes with recent pandemics like HIV/AIDS, SARS, Ebola and H1N1, the scale of those affected and efforts to contain the spread of COVID-19 are unprecedented. This is a unique opportunity for humanists and social constructionists who might also engage with complementary approaches like post-positivism, critical theory, standpoint theory and non-representational theory. While the methods we use will necessarily need to tap into the same technologies we use to contain COVID-19's spread (e.g. Zoom, Skype), the core principles are the same—understand meaning through close interaction with marginalized groups supported by empathy and a critical theoretical eye on structural underpinnings and bigger picture policy relevance.

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Chapter 9
Mapping the Post-structural Geographies of COVID-19

Joshua Evans

COVID-19 is the name of a disease caused by a virus named SARS-CoV-2. At the time of writing the virus had infected an estimated 35 million people worldwide and killed 975,000. Government measures to stem the spread of the virus, such as border closures and stay-at-home orders, have slowed transmission but decelerated the global economy. Unemployment rates are the highest they have been since World War II. After locking down, many countries have begun a phased reopening, encouraging individuals to social distance and wear face masks provoking resistance among some. In the absence of a vaccine or effective treatment, and as case numbers continue to rise, the future remains uncertain.

To call this, "an experience" might at first appear to trivialize the unprecedented moment we are living through; however, problematizing the situation as an experience is vital. This is the aim of post-structuralist analysis. It begins with the claim that the coronavirus pandemic is a *historically formed experience* (Blencowe 2012) and then proceeds to problematize this experience by asking what preexisting conditions make it possible to describe the experience as I have above? In other words, it seeks to diagnose the present moment by exposing the historically derived speaking positions, institutional settings, and knowledge systems that enable us to talk meaningfully and truthfully about the pandemic today. Moreover, post-structural analysis invites us to interrogate how we are constituted as subjects through this delimited experience as we represent it to each other and ourselves.

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While it might seem self-evident that this coronavirus experience is a public health, economic, and personal crisis, a post-structural analysis draws attention to what is assumed in this formulation. In this regard, an array of geographically contingent and historically produced *categories of knowledge* can be identified. Three in particular will be explored here: population, economy, and the individual. While they might appear as natural or timeless, these categories are the product of a complex set of practices that have coalesced over time in contingent ways.

When it comes to the historical formation of these categories and their relevance to health and disease in the Western world (where I am writing from), the work of Michel Foucault (1926–1984) is instructive. Through a series of historical examinations focused on early modern Europe, Foucault worked to uncover the epistemic conditions shaping the emergence of fields such as psychiatry, clinical medicine, and the human sciences. Later, in his historical examinations of imprisonment and the modern state, Foucault expanded his analysis to include power relations targeting individual bodies and the social body more generally. These later writings traced the emergence of categories such as population, the economy, and the individual. Moreover, they show how these categories came to be correlated with techniques of power forming a new field of governance: a liberal biopolitics.

The category of *population* was and remains central in this regard. One of the ways the coronavirus pandemic is rendered visible today is through country-level or regional-level population statistics such as total cases, hospitalization rates, and deaths. This notion of a statistical *population* has a history. Foucault (2007) traced its conceptual emergence to the burgeoning towns and cities of France where authorities grappled with epidemics such as the plague and smallpox, employing tactics such as spatial quarantine and inoculation. As authorities in France and elsewhere gathered medical statistics to describe patterns associated with disease (type, distribution), and linked these to various environmental or social factors, the notion of population as we understand it today became thinkable. Henceforth, population came to be understood as a natural, biological phenomenon bound to a milieu and characterized by patterns that could be described quantitatively in terms of normativity. Understood in this way, population has served as a fundamental reference for the development of the human sciences (medicine, psychology, and sociology).

Developing alongside this emerging reality of population was a new conception of *economy*. Today, economic reasoning features prominently in discussions of coronavirus. For example, the pandemic is cast as problematic in terms of the economic disruption attributed to preventative interventions such as lockdowns. The economy, idealized as a space of free circulation, is seen to be impeded by government intervention. This notion of the economy might seem self-evident, but like population, understandings of economy have also been historically produced. In France, for example, the reasoning of mercantilists held sway up until the seventeenth century. They saw economy as the proper management of a territory and its wealth which was akin to managing a family household. Over time, however, disastrous famines and epidemics challenged these understandings. In these problematic contexts, a new form of economic reasoning, called physiocracy, equated the economy more squarely with the naturalness of population, something that should be treated according to its own intrinsic processes. During the eighteenth century, this idea was extended further giving rise to classical

political economy which posited an economy that followed natural laws tied to the circulation of people and wealth. This principle was used to rationalize a liberal art of governing, which correspondingly aimed to be economical by intervening in the least amount possible while achieving the most possible (Foucault 2007, 2008).

Today, both the population and the economy are widely conceived as a collection of freely circulating, living *individuals* (Foucault 2008). These individuals are key targets of public health strategies that aim to motivate certain behaviors, such as voluntary testing, personal distancing, and handwashing, in order to slow the spread of coronavirus at the level of the population. However, like population and economy, the very notion of an individual, as a self-interested and self-sufficient living being, has been historically produced. From the seventeenth century onward, a number of disciplinary institutions (i.e., prisons, schools, hospitals) formed around the production of "useful" individuals (Foucault 1977). These disciplinary strategies operated on the basis of norms provided by the human sciences (medicine, psychiatry, and sociology) and worked on and through the body to refashion the "soul" (perceptions, habits) forming normal individuals in the process. Increasingly, normality came to be associated with the rational, self-enterprising, and autonomous individual whose freedom was the natural limit of governmental activity (Foucault 2008).

These three categories of knowledge—population, economy, and the individual—are brought together in the notion of *liberal biopolitics* which describes the attempt, starting from the eighteenth century, to rationalize from the perspective of economy, the problem posed by a population understood as a set of living individuals (Foucault 2007, 2008). This problematic is germane to epidemics. For example, it is documented in François Delaporte's seminal book *Disease and Civilization: The Cholera in Paris, 1832* (1986). Relatively unknown to health geographers, Delaporte's (1986) book explores the cholera outbreak that swept through France, paying close attention to the competing medical theories, administrative strategies, and political tactics mobilized during the epidemic.

Prior to cholera's arrival, some believed France, as a highly "civilized" nation with an advantageous geographic position, would be spared. But this would not be the case. Partitioning Paris into sanitary cordons overseen by a hierarchical organization of inspectors did not stop cholera. Delaporte (1986) documents the meticulous ways that French medical authorities investigated the spread of the disease in the French population, using administrative data to correlate mortality rates with topographical data, population densities, and housing conditions, eventually finding that "cholera's first victim was the pauper" (Delaporte 1986, p. 10). He follows the emerging preoccupation with the economic impacts of quarantine measures on free trade, measures that were later abandoned. He documents the class antagonisms that intensified during the epidemic and that eventually led to the living conditions of the proletariat masses becoming politicized. In doing so, the book documents a watershed moment: the biopoliticization of French society.

Today, we are living in the wake of this moment. Our experience of the pandemic is similarly framed by notions of population, economy, and the individual that together enable us to talk meaningfully about coronavirus. Are active cases on the rise? How do we compare to other countries? Is the government doing enough or too much? Should I wear a mask or not? Should I get tested? In addressing these

questions, we draw on these inherited categories, and we are biopolitically constituted as subjects in the process. We are positioned as living beings belonging to a national, social body bound to a geographical milieu, whose freedom to take risk and assume responsibility is both the instrument and limit of governmental intervention.

This mode of subjectification is problematic but not because it invokes categories of knowledge that have been historically produced. Their historicity simply reminds us that, as contingent phenomenon, these categories can be thought differently (Koopman 2013). This mode of subjectification is problematic insofar as it joins and holds in tension two seemingly incompatible elements: freedom and government. Whether conceived in relation to the naturalness of the population, the circulation of goods, or the autonomy of individuals, governing in Western contexts operates through freedoms. This governing through freedom operates through *mechanisms of security* (e.g., vaccination, health care, social insurance) that allow things to happen naturally and follow their course within a certain bandwidth of acceptability while minimizing negative effects that might jeopardize the population as a whole (Foucault 2007). While on the surface, freedom and government seem irreconcilable, and are often represented as such in popular conversation, in practice they form an interstitial relationship, as "two reciprocal but incompatible aspects of our existence" (Koopman 2013, p. 170). This is because epistemic objects such as population, economy, and the individual are internal to the practice of government: they are *transactional realities* created through systems of power/knowledge (Foucault 2007).

The pandemic reveals these transactional realities and their internal tensions to us. The more the virus tests the mechanisms of security that have, up until this point, maintained the uneasy relationship between freedom and government, the more we are confronted with these conjoined aspects of our existence. During a pandemic, the government is still rationalized in terms of the problems posed by a biological population, but freedom in the economy or among individuals is no longer just an instrument of government, rather it also becomes a threat. With no vaccine, the population cannot be protected and the free circulation of individuals will spread the virus. Moreover, the virulence of SARS-CoV-2 will produce a death toll well beyond the normal bandwidth of acceptability. Therefore, authorities are faced with the question: cross the liberal threshold (e.g., lockdowns, mandatory masking) or not?

Looking backward to diagnose the present situation, as confronted by Western societies, reveals the limits imposed upon us by certain epistemic objects, in this case population, economy, and individualization. It also reveals a central problematic—the simultaneous deployment of freedom and government—that functions as the biopolitical backdrop to how we represent the pandemic to each other and ourselves. Understanding this biopolitical backdrop is imperative, particularly the extent to which it restricts or liberates self-direction and self-development *and for whom*. Dealing with this problematic situation will involve challenging received understandings of population, economy, and individual autonomy, a move that will require that we rethink freedom itself. In reconstructing liberal biopolitics in this

way, it is vital to also acknowledge that we will, in the process, be reinventing ourselves.

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Chapter 10
Non-representational Approaches to COVID-19

Check for updates

Chloe Asker, Gemma Lucas, and Jennifer Lea

I'm sitting at my desk, trying to write. Everyone is working at home, and the house feels full, noisy, and overwhelming. I'm not used to this proximity with my family's working lives. There's an atmosphere of stress and anxiety.

Suddenly, my phone screen lights up, a notification from BBC News: 'The world is shutting down'. A feeling of vertigo, of overwhelm. I feel surrounded and consumed by COVID-19 and its effects: death tolls, news cycles, Twitter hot takes. It's suffocating.

1   Introduction

This chapter emerges through a series of autoethnographic vignettes interspersed with theoretical analysis. Together, these fragments invite speculation about the ways in which geographers might use non-representational approaches to think through the effects of the COVID-19 pandemic (Fig. 10.1).

Emerging from Thrift's work on non-representational theory (NRT) in the 1990s, non-representational approaches have had a significant impact on ways of thinking and doing in human geography. Work has been done elsewhere to map out the theoretical influences of NRT (e.g., Anderson and Harrison 2010) but to summarise, they have 'a *practical* and *processual* basis for [their] accounts of the social, the subject, and the world, one focused on the "backgrounds", bodies and their performances' (Anderson and Harrison 2010, p. 2). In other words, NRT has reconfigured what 'counts' as academic knowledge, engendering relational ways of thinking that reconceptualise the body as *knowledgeable in itself* (Dewsbury 2000) and allow affective, atmospheric, non-cognitive, sensual and other 'felt' ways of knowing to come to the fore.

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Fig. 10.1 BBC News Alert (author's iPhone screenshot)

So far NRT has, in general, focussed on the vital and enchanting elements of life rather than experiences of exhaustion, grief and decay (Philo 2017). In response, this chapter uses vignettes to explore some of the ways that the unforeseen and unchosen circumstances of the COVID-19 pandemic have exposed bodily vulnerabilities. We focus on the ways in which the pandemic has halted our habitual embodied geographies, making us re-question our fundamental understanding of what our bodies can do.

As such, the chapter demonstrates how NRT emphasises the way that space and time emerge through embodied practice (Macpherson 2010) as bodies are constituted through their encounters. Such encounters matter. They are significant to our felt sense of the world and our resultant becomings. They interrupt our habitual ways of moving, sensing and feeling, producing a new COVID-19 'normal'.

The chapter proceeds by presenting two juxtaposing encounters experienced during the lockdown phase of the pandemic in the South of England, UK. Following this, we begin to explore an 'ABC' of non-representational concepts, inviting the reader to proceed beyond 'A', 'B' and 'C' as they make their own connections and think about their own experiences. By offering a series of 'tactical suggestions' (Dewsbury et al. 2000 in Colls 2012, p. 432) for thinking with our lived experiences of the pandemic, this chapter performs some of the tenets of non-representational thinking and doing. To conclude the chapter, we speculate more explicitly on how non-representational approaches might offer purchase in understanding experiences of COVID-19.

2   Vignettes

2.1   Encounter 1: Gemma

There are signs and posters plastered everywhere, shouting the new rules in bold print. I feel a faint buzzing sensation behind my eyes, my ears, a slow-build fog of COVID-19 weighing heavily on my limbs. I walk, slightly dazed, towards the 'hand-sanitising station' jumping suddenly to the side to keep the 2-m distance as a man emerges from the aisle to my left. He looks startled, but then smiles and thanks me. I smile back and our eyes meet. As we hold eye contact for a fraction longer than usual, I feel the weight of his 'thanks', that one tiny

word that spoke volumes, yet left so much unsaid. One word that spoke to our connectedness, to our mutual imbrication in this experience, our shared responsibility. In that moment, he and I were 'in it together', protecting each other, doing our best. It broke my heart a little.

I lower my eyes, the feeling of my hands (those potentially deadly, infection-carrying hands) dangling limply by my side, waiting for him to pass. Then I resume my mission. What do I need? Pasta. Ok. Empty shelves...

2.2   Encounter 2: Chloe

I'm standing in the queue for a local supermarket. I notice a bouncer outside the store controlling the crowd. Other attendants are disinfecting trolleys and monitoring the line of people waiting to enter the store. It's hot, and I'm getting a headache; my eyes squint in the sunlight. In front of me a man is talking *at* other shoppers, waving his arms in the air. I'm curious. No one else is talking; everyone is silent. They are all ignoring this man. He turns around to me and comments loudly: 'queueing like this is ridiculous!'. I'm taken aback. I reply, 'it's a pain, but it's necessary at the moment, isn't it?'. He scoffs, and shouts, 'the virus isn't real, it's all a hoax! The government wants to control us!'. Anger swells; I think of the death tolls and friends who have lost family members. I angrily retort back, and he interrupts, asking me for proof that the virus is real. Others in the queue tell him to be quiet: 'no one wants to talk about this here'. He enters the shop, whilst arguing with the staff.

I do my shopping, feeling rattled and unsure—I don't want to meet this man again. The headache is getting stronger, and my vision is blurry. I finish my shop, pushing my heavy trolley out of the store. The shop attendant stops me, asks me if I'm alright. I tell her I'm fine, but my voice is thick and wavers. I feel drained.

3   Suggestions/Openings

Absent Presence   This signals the turn to the spectral in geography—those haunting and haunted aspects of place and experience (Wylie 2009). Ghosts and the spectral offer 'impassible' ways of understanding that are incommunicable, unexpected or unforeseen (Maddern and Adey 2008). Spectrality extends non-representational thinking beyond the enlivened, vital and 'ongoingness', to emphasise 'obduracy' and 'persistence of presences that somehow remain' (ibid, p. 293).

Affect   Non-representational theories are underpinned by a relational ontology. In the most basic terms, this means that nothing stands alone; whilst we might talk about the body, what we really mean is the body-in-relation. A variety of different conceptual mechanisms for thinking relationally have been mobilised, but the one that has taken the greatest hold, perhaps, is the idea of 'affect' (Deleuze and Guattari 1988). Attending to the affective realm enables the development of both a moment-to-moment understanding of what the body is (how it is configured through its relations to objects, other bodies, atmospheres, etc.) and what emerges as a result of that configuration (the capacity of the body to act).

Atmospheres An affective atmosphere is a kind of 'moody force field' (Closs Stephens 2016, p. 183) or charged sense of 'feelings circulating in the air' (ibid, p. 182). Activated through assemblages of bodies, materials and ideas, they are unpredictable, excessive and impossible to control. Regardless of attempts at 'stage managing' them (ibid, p. 185), their nebulous, diffuse and distributed quality can make them difficult to 'pin down'. They are, nonetheless, powerfully felt in the sensing body (McCormack 2008).

Bodily Knowledges Non-representational approaches have reframed the body as knowledgeable in itself, meaning that bodily registers (e.g. the non-cognitive, the sensual, the felt, etc.) are seen to be significant and are brought into our academic understandings. Rather than being unknowledgeable and insignificant (relegated contra the mind in Cartesian understandings) or made as a rather passive, socially determined object (in some accounts of embodiment), the body instead becomes refigured as active in, and central to, how we live in the world (Dewsbury 2000).

Corporeogeographies Bodies are 'fluid, volatile, messy, leaky' (Longhurst 2001, p. 11). Geographies of the body, or corporeogeographies, have challenged the masculinist, ableist, clean and coherent notions of the body as airtight and complete (ibid). Corporeogeographies name the messy, turbulent, leaky and porous elements of the body: farting, bleeding, urinating and giving birth, to name a few. Here, all bodies are revealed to be 'monstrous' (Colls 2006), a term which signals the vulnerability and instability of *all* corporeal experience.

4 Summary and Conclusion

COVID-19 is invisible, yet it is ever present, haunting the public sphere. It exists in a relation of 'absent presence', becoming 'constitutive of the entire experience' (Wylie 2009, p. 282), as public spaces become 'danger zones' where government mandates and 'lockdown' orders are a constant, looming presence. In the street and the supermarket, we see usual sights, hear sounds and navigate familiar places, but they reverberate with a charge, a kind of palpable, yet intangible, vibration in the air that envelops us, and radiates upon, through and between us with a contagious quality, like the virus itself. The felt sense of this 'danger zone' and experience of the disease weighs us down, making us feel slow and deliberate. Our habits, interactions and reactions are re-moulded through new supermarket layouts, posters, signs and sanitising stations. Here, the knowledgeable body becomes more apparent. We learn to navigate life in lockdown. The regularly changing situation reconfigures rules on travel, proximity and meeting up on a weekly basis. The body is forced to continually renegotiate its relation to the world—how it moves, senses and feels.

These choreographies are performed by a leaky and vulnerable body. The absent present nature of COVID-19 unsettles our assumptions about our complete and

bounded corporeality. The body is reconstituted as a vector of coronavirus, as we realise that we are all susceptible to the disease. This leaky, vulnerable body is radically open to affect and be affected. It is reconfigured through our encounters with others. Encounter here means meeting, but a meeting that involves surprise and conflict (Ahmed 2000). We are affected by the encounter because we are always already vulnerable and open to what arrives from the outside.

Offering understandings of the world through an encounter (such as the two presented here) has become one key way in which geographers drawing on NRT have presented their research. Presenting these encounters relies on the researcher using their own body 'directly in the field as a recording machine itself' (Dewsbury 2010, p. 8), and involves attuning to 'often overlooked or ignored minor details' (Ash and Gallacher 2015, p. 82), which might act as 'lightning rods for thought' (Dewsbury 2010, p. 8). The structure of this chapter has modelled how this might happen, presenting two encounters and then five concepts that might prove productive in relation to COVID-19.

The pandemic has variously revealed, refigured and reconstituted our bodily boundaries and knowledges, affective and felt experiences in public spaces and everyday encounters and routines. NRT gives us a way to make sense of these reconfigurations, both offering purchase on the enormous societal changes that are being brought about by the pandemic and opening up the more varied, intimate and ephemeral modes of existence that are also emergent.

This chapter offers an open invitation to the reader to reflect on COVID-19 and its impacts by developing the NRT alphabet further, so they travel from 'doubts', 'discourse' or 'decisions', via 'emergence', 'embodiment' or the 'everyday', to 'feeling', 'flow', 'freedoms' and beyond. The unique NRT ABC that emerges for each reader can offer one route towards coming to terms with both shared and individually registered affectual and atmospheric experiences and the ways our bodies are intimately shaped by these encounters.

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Part II
Substantive Issues

Chapter 11
How to Have Theory in a Pandemic: A Critical Reflection on the Discourses of COVID-19

Tim Brown, Sydney Calkin, Kerry Holden, Simon Reid-Henry, and Stephen Taylor

1   Introduction

In her groundbreaking *How to Have Theory in an Epidemic* (1999), cultural theorist Paula Treichler showed how disease outbreaks become *epidemics of signification* as much as of disease transmission. Such a focus can bring into sharp relief the cultural, political, and ideological work at play in framing an outbreak of infectious disease as well as illuminate the social fissures which so often smooth the passage of infection through a population. It can also promote understanding of how societies do, and perhaps should respond, to the "unpredictable cultural upheavals and realignments" that are so often a feature of epidemic afterlives (Treichler 1999). While Treichler is a cultural theorist, her writing has considerable relevance for geographers, as well as for many other scholars engaged in interdisciplinary discussions about the characterization of infectious diseases and of the places and people affected by them. As such, this entry begins with a more extensive engagement with her argument before shifting to other scholars, such as Priscilla Wald, who have themselves sought to unpick the narratives that so often frame our understandings of disease. We adopt this position because we argue that to understand the social and spatial unevenness with which COVID-19 has unfolded across the globe requires attention to the discourses that have shaped it.

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2   Narrating Contagion

Treichler was especially interested in HIV/AIDS; her chronicles were published at the end of the twentieth century. As such, she documents the gendered, racialized, and distinctly homophobic cultural politics that framed the pandemic during the Reagan years, the activism that reshaped the subsequent political and public health response, as well as the later recasting of HIV/AIDS as one of the many "emerging infectious diseases" posing a threat to global (read the West's) security at the *fin de siècle*. This time frame gave Treichler a temporal and spatial perspective that is not yet available to us in studying COVID-19. However, the response to COVID-19 has so far played out in much the same way as Treichler exposed for HIV/AIDS. The "sheer volume and wild diversity" of the multiple meanings of AIDS that she detected is apparent once again (1999). And once again, such chaos nonetheless has a definable shape and meaning. The very nature of HIV/AIDS was understood through the power of language to frame the pandemic in relation to a variety of social, political, and moral anxieties, for example. So too for COVID-19.

Priscilla Wald's *Contagious* (2008), written in the wake of SARS, extended Treichler's concern through its consideration of the "outbreak narrative." Focused on the staging of infectious diseases, Wald explores the production and replication of core tropes articulated in the discourse of scientists, politicians, journalists, and alike. Almost inevitably, the origin stories of a pandemic rely on the pathologization of space. In the case of COVID-19, as with SARS before it, this meant placing the spotlight on the Chinese "wet" market. It was these live animal markets that were first identified as the probable source for the pandemic, following the identification of early cases in Wuhan City traceable to the Huanan Seafood Wholesale Market. The animal host for the virus remains uncertain and so too its pathway into the human population, which leaves room for alternative accounts of the viral origins of the pandemic. Some accounts have vindicated Chinese "wet" markets, for example, by replacing them with the Wuhan Institute of Virology as the possible source; others use this connection to reinforce xenophobic and nationalistic tropes (Rogers et al. 2020).

This concern with viral origins and with the associated representations of pathological space leads us to Wald's focus on the figure of the "disease carrier." Whether Patient Zero in the case of the AIDS pandemic; the vacationing Chinese clinician at the Metropole Hotel, Hong Kong, during the SARS pandemic; or, in the context of COVID-19, a 61-year-old Korean "super-spreader" blamed for infecting 37 of her fellow congregation at the Shincheonji Church of Jesus, "disease carriers" are transformed in the outbreak narrative from the human victims of a pandemic into its harbingers of death. These are the conduits through which global network hubs are connected and via which infectious diseases spread (Ali and Keil 2008). It is not only that pathological sites such as "wet" markets and the practices occurring within them are perceived to render permeable the boundaries between animals and humans, but they are, in Wald's terms, connected to the rest of the world via these transnational travelers who connect "everyone to everyone [and everything] else"

(2008). Meanwhile, the political economy which shapes the routes and volumes of such travel, and which links it to the production systems that intensify human-animal relations, recedes into the background of analysis.

The much-maligned figure of the "disease carrier" not only dramatizes an epidemic and renders it meaningful and knowable but also helps to reinforce what Wald (2008) refers to as an "epidemiology of belonging." Here, language and reality combine to forge the complex and contradictory features of any "epidemic of signification." At one and the same time, the experience of an epidemic brings a population together as "a *people*" as well as demarcates the boundaries that exist within and between them. Across the globe, this sense of a shared experience in the face of a common enemy was reflected in shared practices such as nationwide clapping in support of the NHS in the United Kingdom (UK), collective singing in Italy, and through other similar acts that promoted a sense of togetherness. And yet *some* people in the UK, as with other countries, have been subjected to what Anna Russell, writing for *The New Yorker*, refers to as "Coronavirus hate crimes" (Russell 2020).

3 Protecting the Herd

Given the established history of stigmatizing the "disease carrier," we should not be surprised by Russell's account nor by the resurgence of "medicalized nativism" that it represents (Kraut 1994). However, it is again an important reminder that contrary to popular sentiment, "we are *not* all in this together," far from it. The question of structural violence is an important one to raise here. As Amartya Sen (2005) notes, Farmer uses the term to capture the complex interplay of power, structure, and violence and in a way that doesn't lose sight of its "shady edges." Perceived in this way, we cannot easily lay the blame for the unevenness with which COVID-19 has been experienced at the doors of an individual health agency, in the hands of individual public health officials, nor even at the feet of individual politicians, however incompetent the response may appear to have been. Yet, we can say, following Farmer's logic, that the interplay of already established structures of power and associated forms of violence has figured in shaping this unevenness: something rendered apparent by the review, *An Avoidable Crisis*, led by Doreen Lawrence into COVID-19's impact on BAME communities in the UK. With COVID-19, we are seeing that where the burden of the virus was felt most acutely mapped onto social fissures including those of class, gender, and race that existed well before the virus mutated into its current pathological form.

For example, in the UK, the risk of death from COVID-19 was highest among people of Black Caribbean and Indian ethnicity and higher among several other minority ethnic groups than the white British population (Aldridge et al. 2020). Similarly, the death rate in Washington, D.C., was reported early in the pandemic as being six times higher among African Americans than whites. It was higher among the poorer classes too: for those unable to "stay at home" because to do so would be to lose access to already precarious resources (Human Rights Watch 2020). This

pattern of uneven exposure to the virus among racialized groups was not unique to the UK or United States (US), nor were the uneven impacts of the virus limited to comparative mortality tables. The burden of infection was also higher among Somali groups (frontline workers in the taxi sector) in Norway. Preexisting gender gaps compounded the adverse effects of COVID-19, not least through the erasure of hard-fought gains in women's and girl's empowerment across the world in recent decades (John et al. 2020). Gender inequalities in the home were also exacerbated in the early stages of the pandemic. Women and girls bore a disproportionate share of the increased demand for care work, and reports of domestic violence rose dramatically during the COVID-19-lockdown.

Such unevenness in the face of COVID-19 highlights the importance of the politics of situatedness as much as the material realities of a world divided; austerity politics have bitten hard into the distribution of public goods and services, including health-related ones, in countries such as the UK, widening inequality and placing the most vulnerable on the edges of, and in many cases, into the pitfalls of, precarity (May et al. 2020). It is against this backdrop that the response to COVID-19 as it was enacted by the individuals and agencies previously mentioned must also be critically interrogated. Here, it is worth noting that the UK's response, characterized as reflecting the British "stiff upper lip," was informed by the insights of behavioral scientists concerned that adopting social distancing measures too early on would result in "behavioral fatigue" and a, albeit brief, suggestion by one of the UK government's scientific advisers that herd immunity was a plausible strategy (Horton 2020), a strategy that Sweden in fact did follow, resulting in substantially higher mortality rates than neighboring Norway.

That the former held sway should be of little surprise; British public health policy has been animated by the insights of behavioral science since at least the past decade. Indeed, as Jones et al. (2014) argue, there has been a paradigmatic shift within the policy-making milieu of the UK. Now independent of government, the emergence and subsequent growth in importance of the Behavioural Insights Team (BIT), the so-called nudge unit originally located at the heart of government in the Cabinet Office, reflects an ideological commitment to a form of libertarian paternalism that seeks to minimize the "interference" of the state and promote individual wellbeing and the collective good through behavioral change or nudging. BIT was quick to extol the virtues of behavior change theory. As they noted, there was a risk that people would "underreact to coronavirus" and that governments needed to ensure citizens "follow the instructions of public health experts" (Merriam and Behrendt 2020).

Here, there is a need to unearth the behavioralist discourse from within more basic public health messaging: exhortations to engage in regular handwashing; avoid touching one's face, shaking hands or hugging; or, later in the pandemic, wear a face covering in public reflect the extensive reach of public health into societal and individual behaviors during this pandemic and represent a powerful opening for the behavioral sciences to consolidate their influence over policy-making. It is a reminder too of a powerful point Treichler makes in the epilogue to her account and one which we believe deserves extended critical reflection in light of COVID-19:

"The call for compassion and caring," Treichler argued, "has served important social ends, asking citizens to rise above prejudice, discrimination, and fear and help the suffering." Importantly, though, Treichler extends her argument: "At the same time, no other single view is so overarchingly irrefutable, so unreflectingly embraceable, or so glibly deployable in short-circuiting discussions of structural inequalities, politics, and economic needs" (1999, p. 317). So, we might be nudged into caring as *a* people, but the question is how far will society take these insights when it comes to the multiple forms of structural violence that have placed some at greater risk to the pandemic than others?

4   Conclusion

In time, COVID-19 will tell its own story about the politics of expert knowledge and the signification of science in appearing to govern well, take back control, and tame a wild, aberrant biological agent, this silent enemy. And it is in this space that we must allow theory to emerge. Treichler turned to the cultural theorist Stuart Hall to highlight a crucial tension that faces many scholars, especially those in the humanities and social sciences, living through an event such as this: we are torn between the desire to respond and the feeling of our superfluousness. Recalling Hall (1992), as Treichler does, we might question when faced with announcements of the latest death toll, what is the purpose of the kind of intellectual labor that we are individually and collectively engaged in? We may feel the ephemerality, insubstantiality, and lack of register that Hall remarked upon when writing about AIDS. And yet, as geographers engaged in interdisciplinary dialogue, we are confident that we can draw on theory in ways that allows us to not only chronicle COVID-19 but to account for the unevenness with which its worst excesses have been experienced.

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Chapter 12
Health Service Capacities, Responses and Practice

Martin Powell and Sophie King-Hill

1 Introduction

One of the authors has had research interests in the spatial distribution of healthcare for some 35 years, but it seems that this issue is not of great relevance to the COVID-19 pandemic. Exploring geographical perspectives on and implications of COVID-19 for health services is problematic for three main reasons. First, the vast majority of scholars who focus on health services explore 'normal' times, with long-standing issues which often change rather slowly. Very few scholars explore huge and fast-moving 'external shocks' such as COVID-19, which fits within literature on 'disasters' and 'crisis', with its constituent elements of threat, urgency and uncertainty.

Second, and arguably more important, sadly the geography of health services may have little relevance to COVID-19 control. With no effective vaccine or effective therapies, such as antivirals, governments' responses are essentially composed of 'non-pharmaceutical interventions' (NPI), very similar to those used in pandemics such as 'Spanish flu' over 100 years ago.

Third, it is very difficult to write a sequel when the original story has not ended. At the time of writing, the peak of the first wave of COVID-19 has passed in many Western nations, but with some resurgences in some nations after 'lockdowns' were relaxed, meaning that the short- and medium-term implications of the much-used term of the 'new normal' are not clear. COVID-19 followed a clear geographical diffusion process as it moved with astonishing rapidity from nation to nation. The key figures of recorded cases and deaths in both absolute and per capita terms display a huge geographical variation (e.g. www.worldometers.info).

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2 Health Service Capacities, Responses and Practice

Many academic disciplines have been keen to stake their claim on perspectives on COVID-19. For example, Jones (2020) provides a historical perspective. He cites the fourth edition of a standard text on the natural history of infectious disease in 1972 which stated that 'the most likely forecast about the future of infectious diseases is that it will be very dull'. Jones adds that times have changed. From AIDS, Ebola, severe acute respiratory syndrome (SARS) and now COVID-19, contagious diseases continue to threaten and disrupt human populations. He considers that historians never lost interest in epidemics. Similarly, geographers never lost interest in epidemics (Ref Introduction; history chapter). However, they have tended to focus on the spatial epidemiology rather than health service provision.

In 1969, the US Surgeon General declared it was time to 'close the book on infectious diseases, declare the war on pestilence won' (in Saunders-Hastings and Krewski 2016). However, many geographers had closed the book on the geography of infectious disease provision with the drugs revolution. However, within the past 100 years, four pandemics have resulted from the emergence of a novel influenza strain for which humans possessed little or no immunity: the H1N1 'Spanish flu' (1918), (c 40–50 million deaths), the H2N2 Asian flu (1957) (1–2 million deaths), the H3N2 Hong Kong flu (1968), (0.5–2 million deaths) and the H1N1 swine flu (2009) (up to 0.575 million deaths) (Saunders-Hastings and Krewski 2016; DHSC 2020). While the spatial epidemiology of these and other epidemics has been studied, there has been relatively little work of the associated capacity and response of health services.

The geography of health provision has been extensively studied, pointing to variations at a variety of spatial scales. For example, the number of hospital beds and staff varies between nations (e.g. Rhodes et al. 2012). Similarly, in Europe, Germany had the highest number of intensive care unit (ICU) beds (29.2/100,000 population), whereas Portugal had the lowest (4.2/100,000) (Rhodes et al. 2012).

One of the main aims of some governments during the COVID-19 pandemic was to ensure that their health services were not overwhelmed. This seems to be a rather strange focus on means rather than on the obvious end of minimising mortality. For example, in the UK, the stress placed on the different elements of the mantra of 'Protect the NHS. Save Lives' was unclear, but discharging patients from hospitals to care homes, without a test, in order to free up capacity had tragic consequences.

While some nations had more general and specialist capacity than others, even the most generous provision is insufficient without mitigation through NPI. For example, on March 16, Ferguson et al. (2020) predicted that for an uncontrolled epidemic, critical care bed capacity in the UK would be exceeded as early as the second week in April, with an eventual peak in demand that is over 30 times greater than the maximum supply.

This leads to a focus on two issues of preparedness and surge capacity. First, it was thought that some nations were well prepared for global health emergencies. For example, the UK claimed that it was well prepared (DHSC 2020), but this was

a tragic narrative of hubris. The focus in many nations was on pandemic flu (e.g. DHSC 2020), and the UK entered the COIVD-19 pandemic with a seriously depleted stockpile of PPE, including out-of-date stock. However, some nations did seem to be better prepared than others.

While it was possible to learn lessons from abroad on preparedness, it was possible to learn lessons from history on what later became termed 'surge capacity'. In the UK before the NHS, the local authorities ran infectious disease hospitals, which tended to have low occupancy rates but were standing ready, hoping they would never be fully used. In one case, when asked to show a smallpox hospital, hospital surveyors were shown a field where a tent would be pitched (Godber 1983).

Christen et al. (2020) argue that planning for extreme surges in demand for hospital care of patients requiring urgent life-saving treatment for COIVD-19, and other conditions, is one of the most challenging tasks facing healthcare commissioners and care providers during the pandemic. The most visible symbols of surge capacity were the hospitals built very quickly in China and the conversion of large buildings such as Exhibition Centres into 'Nightingale' hospitals in the UK. However, it was estimated that the setup of these field hospitals increased the capacity of critical care and general beds by 500 (12%) and 8000 (8%), respectively (Christen et al. 2020). However, this was one element within a much wider strategy. From a survey of 12 European nations, Christen et al. (2020) identified 18 interventions, of which 13 are increasing or reorganising the provision of care, and 5 manage admissions to care, particularly critical care. These included managing admissions (e.g. cancellation of elective operations); the use of private healthcare resources; converting operating theatres to critical care wards; increasing critical care bed capacity; converting general beds to critical care beds; upskilling staff to work in critical care wards; encouraging the return of former healthcare staff; and deploying newly qualified and final year medicine and nursing students.

However, while the health service response in many nations may be considered very successful in terms of surge capacity, this does not appear to have much association with death rates. Some nations with high levels of general and specialist provision suffered high mortality rates. For example, Belgium with 15.9 ICU beds/100, 000 has the highest per capita death rate in the world, while Greece (6.0) has a much lower death rate. Conversely, Denmark and the UK had similar ICU provision (6.7 and 6.6, respectively), but very different death rates (Rhodes et al. 2012; www.worldometers.info)

3   Futures Issues

We suggest three further issues to focus on in the future. First, given the large variety of national responses, there are clear opportunities for learning. As there was a small degree of lag time in the geographical diffusion process, nations had a small window for intra-crisis learning such as from 'lockdown' in China and contact tracing in South Korea (e.g. Weible et al. 2020). However, intra-crisis learning is

difficult, with some verdicts changed very rapidly. For example, nations such as South Korea and New Zealand have both been considered as poor and great performers, while unclear and changing verdicts have been made on nations such as Sweden and Japan. Moreover, the verdict is not yet clear for many nations. Nations in the Global South generally have weaker health systems, but the death rate may be reduced due to younger populations. In due course, they will be an opportunity for inter-crisis learning. While many lessons are related to NPIs, it is clear that stockpiles of PPE and domestic manufacturing capability rather than relying on 'just in time' global supply chains, as well as having the capacity for a testing and tracing system, will be important.

Second, COVID-19 appears to be in many ways was a great amplifier of existing inequalities. In addition to large variations in death rates between nations (above), there were large variations within nations. For example, in England, London had the highest age-standardised mortality rate, with 137.6 deaths per 100,000 persons, with the lowest rate of 41.2 in the South West. At a finer spatial scale, the rate for Welsh Health Boards varied from 103.8 deaths per 100,000 population for Cardiff and Vale University Health Board to 25.9 deaths for Hywel Dda University Health Board. For England, the highest age-standardised mortality rate was in 'urban major Conurbations', with 123.5 deaths per 100,000 population, compared to 22.2 deaths per 100,000 population for 'rural hamlets and isolated dwellings in a sparse setting'. In England, in the least deprived area, the age-standardised mortality rate for all deaths was 242.6 deaths per 100,000 population compared to 466.2 deaths per 100,000 population in the most deprived area (ONS 2020).

It was clear very early that age was related to mortality, but other associations with deprivation (above) and race soon emerged. Within the UK, death rates from COVID-19 were higher for Black and Asian ethnic groups when compared to White ethnic groups. Compared to previous years, all-cause mortality was almost four times higher than expected among Black males for this period, almost three times higher in Asian males and almost two times higher in White males. It is suggested that COVID-19 in their view did not create health inequalities, but rather the pandemic exposed and exacerbated long-standing inequalities affecting Black and Asian minority ethnic (BAME) groups in the UK. A wide variety of explanations for these have been examined, ranging from upstream social and economic factors (e.g. inequalities such as household overcrowding, urban locations, deprivation and high-risk jobs) to downstream biological factors (PHE 2020). Many of these factors lie outside health services, but it was noted that some in BAME groups may feel marginalised, have experienced racism or have had previous experiences with a culturally insensitive health service that could create barriers to engagement. Research has shown that individuals from BAME backgrounds often have poorer access to healthcare services as well as poor past experiences of care and treatment, which might mean they are less likely to seek care when needed or as NHS staff less likely to speak up when they have concerns about PPE or testing.

Finally, there may be a greater focus on the integration of health and social care, perhaps with reference to place-based systems. As noted above, the UK aim to 'protect the NHS' seemed to result in 'collateral damage' in care homes.

4 Conclusion

While the heroic efforts of staff in the health and social care systems must be remembered, the main determinant of the loss of life during the COVID-19 pandemic related to factors outside the health care system. Put another way, the most lessons are not for health service capacity, but ensuring that capacity is not put under pressure through NPIs. Nevertheless, COVID-19 will lead to implications for health delivery systems, particularly in the areas of preparedness and surge capacity. Even here, perhaps concerns over preparedness are less linked with the traditional capacity measures of numbers of beds and staff, but more linked with ensuring adequate supplies of PPE and the 'public health' issue of a functioning 'test and track' system. Similarly, while the impact of COVID-19 had clear geographical impacts at many spatial scales, perhaps the main geographical future implications are linked with concern over inequalities and place-based systems that integrate health and social care.

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Chapter 13
Informal Care: The Forgotten Frontlines of COVID-19

Andrew Power and Rachel Herron

1 Introduction

Care involves a complex web of human interactions that take place across a range of settings, from the home to hospitals and residential care facilities. Community care also takes place in everyday spaces people use, including the neighbourhood, library and café. Understanding our landscape as a 'caringscape' (McKie et al. 2001) helps us to understand how care is produced by a complex interplay of practices, relationships and politics that unfold between people. As such, care is a fundamentally geographical process contingent on social contact and the ability of people to move and support others across different settings and scales. COVID-19 has drawn attention to the complexity of these care practices and mobilities and exposed the fragility that often underpins the relationships involved. During the crisis, governments have largely paid attention to the care undertaken in hospitals and care homes. Less attention has been given to the demands placed on informal networks of care, including unpaid care provided by family members as well as friends, neighbours and volunteers.

In this chapter, we examine some of the main place-based effects of COVID-19 on informal carers (hereafter 'carers') as well as challenges for future geographic research on informal care. Since the pandemic's emergence, the caringscape for carers has been significantly reshaped in swift and ever-changing ways. At the time of writing, between March and June 2020, much of the so-called Global North has

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been in varying degrees of 'lockdown' with considerable constraints on travel beyond the home, including 'cocooning' or 'shielding' those deemed vulnerable. We explore the context under which this care has unfolded, and the impacts on those involved, and conclude with a series of questions for critical health geographers about the effects that may remain.

2 Paving the Way for a Crisis

Prior to COVID-19, the social care sector has faced decades of minimum government funding, with the 10 years prior to the virus characterized by austerity. In the UK, for instance, there has been a 60% cut in funding from central government to local authorities (who commission community care) since 2010. This has been enacted through rising eligibility criteria for support and closure of services. Additional structural reforms have also led to the marketization of domiciliary care leading to greater precarity of the care workforce. Governments across the Global North thus had become increasingly dependent on families to care for and support other family and community members.

Since COVID-19, initial evidence has shown that there has been a significant rise in informal care. A UK study (Carers UK 2020), based on a survey of 5047 carers and former carers, found that they were providing 10 hours more care per week than they were before the coronavirus outbreak. This upward trend must be situated within a broader and more long-standing trend of increasing demands on families due to ageing and demographic pressures (Levine 2007). This is particularly evident with those in the 'sandwich generation', whereby carers are responsible for providing care to both their ageing parents and young children at the same time. COVID-19 has arisen at a time when families have become increasingly relied upon, due to both a hollowed-out welfare state and changing demographics. We examine the added impacts which have unfolded in the wake of the pandemic.

3 Shuttering Spaces of Social Care

One of the forces shaping carers' practices has been the closure of many support services during COVID-19. The Carers UK study (2020) found over a third (35%) of people were providing more care because of local services reducing or closing. A quarter also reported they were worried about paid health and social care staff having contact with the person for whom they care. Prior to COVID-19, community-based organizations also helped bridge the gap between informal and formal care by providing support with a range of activities such as meals, transportation and home maintenance as well as social activities such as friendly visiting, exercise programmes, coffee groups and respite (Skinner and Power 2011). In many respects, COVID-19 has also shuttered these voluntary spaces of care. Many drop-in

facilities have closed their doors, and social programming has largely stopped as social gatherings have been prohibited. Many volunteers are themselves older and considered vulnerable, which raises questions about how programming can continue. In addition, funding has decreased because the number of fee-for-service programs that can be offered has ceased and some levels of government are increasing austerity measures to balance budgets.

Alongside voluntary associations, geographers have explored the importance of small acts of emotional and practical support from friends, neighbours and community allies (Bowlby 2011). These included lifts to the doctor, pet care, grocery shopping as well as dropping in and sharing convivial encounters with those in need. During the lockdown, an inconsistent picture of this wider caringscape has emerged. While evidence has found that mutual aid increased during this period (Whitehead 2020), including neighbours offering help such as shopping, a simultaneous increase in misinformation, stigma and fear also emerged as people's concerns about interaction manifested as discrimination and distrust against certain groups, including ethnic minorities (Lin 2020).

One of the dominant recurring themes in the geography of care literature has been carer burden, how care work and often the lack of social and financial support can negatively impact carers' health and well-being. This work has helped identify how experiences of burden and distress are gendered, and how burden can evolve over time in relation to care needs (Herron et al. 2019). Adding to this burden, the wider economic impacts of the virus restrictions may contribute to greater financial stress for family members, particularly women, struggling to provide care and unable to continue work (see Oxfam Canada 2020). It is also worth highlighting the complex emotionally charged nature of providing care, particularly when care is confined to the home, which we turn to next.

4   Changing Relationships of Care Across Space

Family members face additional challenges in the context of strict social distancing policies. Family members who live with a person requiring social care are isolated in place with few opportunities for respite. Several studies on previous periods of quarantine (e.g. SARS) have shown that it is not just social isolation itself that is a challenge. Factors such as boredom, inadequate supplies and information, financial loss and stigma can also have negative psychological effects including post-traumatic stress symptoms, confusion, guilt and anger (Brooks et al. 2020). Some lasting effects can remain after the end of quarantine on health behaviours (e.g. insomnia and lasting increases in substance use) and social engagement (e.g. avoidance of public spaces and contact with others) (Ibid.). Fanacourt et al. (2020) found that during the COVID-19 pandemic, people from Black, Asian and minority ethnic backgrounds have had higher levels of depression and anxiety and lower levels of happiness and life satisfaction. The impacts of social isolation and responsibilities to care are not borne evenly; different groups and places may see increasing demands to care with fewer resources to provide it.

Some family members have found themselves separated from those they care for, either voluntarily or involuntarily. For example, some 'frontline workers' have elected not to see family members for fear of putting their health at risk, while others have been separated by border restrictions or visiting restrictions in residential care facilities. In the immediate sense, social distancing influences the type of social care family members can provide from a distance. Family members can show they care *about* others by phone or video calling, but they have been discouraged and, in some cases, prevented from providing direct care for others. In this way, social distancing may have encouraged more care *about* while reducing care *for* others.

Given the restrictions on movement, organizations and individuals have been encouraged to support one another at a social distance through the use of information and communication technologies (ICT). However, while ICT-based health and social services were becoming increasingly common before COVID-19, the increasing reliance on it has exposed long-standing issues associated with the digital divide. Access to this technology remains poorer in rural areas as is digital literacy among some groups (O'Connell et al. 2018). Indeed, some individuals may not feel comfortable or have support to learn to use new technologies no matter where they live during COVID-19.

This divide is cross-cut with the more traditional urban/rural divide which remains ever-present, as people living in rural places may not be able or comfortable travelling to urban centres to access services and specialists as they did prior to COVID-19. This raises questions about what places and people have access to socially distant support services. Changes in relation to accessing spaces of care as well as changes in the mode of delivering care influence continuity of care and increase informal care work. Resource constraints also limit the ability for adequate continuums of care for people with disabilities which involve preventative care and management of health conditions.

We have yet to see the full range of implications of social distancing on these relationships of care over time. Tensions exist in care relationships at the best of times, for example, carers must contend with conflicting debates over the independence and rights of the care recipient on the one hand, from disability rights or active ageing campaigns (Oliver and Barnes 1998), and the support of women's rights and the valuing of care, from feminist politics, on the other hand (Finch and Groves 1983). It is also important to recognize the varying experiences of women carers from different class and ethnic backgrounds (hooks 1981).

5   Conclusion and Final Reflections

Given the rapidly changing temporality of the COVID-19 pandemic, it is difficult to gauge the legacy effects in its wake. Although the pandemic has been largely indiscriminate of people across space, space nonetheless has influenced how care is practised during this time. The pandemic has revealed the spatial effects of long-standing minimal government investment in social care and a declining welfare landscape,

which carers have borne the brunt of. It has also exacerbated enduring inequalities in informal care support across space, exposing digital and urban/rural divides.

While governments around the world have committed to invest in COVID-19 recovery, much of this funding has been earmarked for large infrastructure projects and company bailouts. Several important questions remain for future geographical research as to how informal caring will be recognized and conceptualized. How will different groups of people and places be affected by the pandemic and its related restrictions over time? How will care practices evolve across the caringscape as we move forward? How will the uneven burden and disparities in care provision be addressed? More widely, will we as a discipline place a higher value on care going forward? Geographers remain well placed to address these questions and to critically inform policy debate on how the crisis could become a turning point in how governments value carers.

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Chapter 14
Resilience, Risk, and Policymaking

Mark Scott

1 Introduction

Resilience has been a much-used phrase during the COVID-19 pandemic. From discussing sector-specific supply chains, or managing complex systems—such as cities, health systems, or food systems—to how individuals or households cope with the crisis, resilience appears to offer a concept or normative policy goal that can help (re)frame policy in times of uncertainty, crisis, and enhanced sense of risk. This chapter aims to critically unpack the concept of resilience and its increasing application within policy debates over the last decade, and its potential utility as an analytical framework for understanding the COVID-19 crisis and its uneven socio-spatial and economic impacts.

2 Resilience Debates

The term 'resilience' was first coined within systems ecology (e.g. Holling 1973) to evaluate ecosystem functions based on assumptions of non-linear dynamics of change in complex, linked systems, whereby resilience describes the ability of a system to absorb or accommodate disturbances without experiencing changes to the system. Subsequently, resilience has also been applied to examine social-ecological systems, particularly how communities and societies cope or respond to environmental crisis and risk, such as climate change, flood risk, or ecosystem degradation (see Adger 2000; Folke 2006).

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Since the early 2000s, there has been a wave of interest in applying resilience thinking to a range of social science and policy disciplines, including disaster planning, economic geography, business and management studies, spatial planning, and community development. A rich body of work also emerged in the wake of the global financial crisis in 2008–2009, whereby commentators increasingly transferred resilience thinking to understand how local and regional economies coped with an economic crisis and instability (for an overview, see Martin et al. 2016). While this interest in resilience suggests a conceptual utility, its application across a range of social science disciplines (and its translation from ecology) also points to its emergence as a fuzzy or elastic concept (Faulkner et al. 2020), whereby the term's substantial meaning becomes diminished or becomes mobilised to support competing policy agendas. To unpack resilience further, the chapter will now turn to two divergent conceptualisations and application of resilience in practice—the *equilibrium* approach and the *evolutionary* approach.

2.1   Equilibrium Resilience

Often referred to as engineering resilience, this approach is defined as the ability of a system to absorb or accommodate shocks and disturbances without experiencing changes to the system (Holling 1973). In this perspective, both the *resistance* to disturbances and the *speed* by which the system returns to equilibrium are the measure of resilience (Davoudi et al. 2013). This approach is particularly common within disaster management, in particular managing responses to geo-environmental hazards, terrorist threats, or disease outbreaks (Barr and Devine-Wright 2012), whereby the ability to 'bounceback' to a pre-disaster state in a rapid fashion is the preferred goal.

In the context of COVID-19, we can see a deeply contested debate regarding 'bounceback quickly' discourses, particularly in the USA with federal and many state governments pushing for a 'return to normal' as a means to protect the wider economy. Indeed, it is likely that the post-crisis political debate in many countries will focus on rapid economic recovery plans to stimulate consumer demand to return the economy to a pre-crisis normal state and return to a previous pre-shock levels of growth, rate of output, or employment.

However, a number of limitations can be identified in relation to equilibrium resilience. For example, the so-called 'normal system' may itself produce risks or may be underpinned by socio-spatial inequities, whereby vulnerability to shocks and risk is defined on the basis of class and race. In this context, the current COVID-19 crisis is shining a powerful light on our pre-crisis 'normal', particularly on existing inequalities and spatial inequities across our cities and regions. Clearly, the pandemic has not been a 'great leveller' and 'we are not all in this together', with uneven impacts across race, class, gender, age, and geography (Scott 2020). The impacts of a decade of austerity and entrenched neoliberalisation are very evident in some countries, such as the UK, where deeply ingrained practices of local

government cutbacks and privatisation of public services have left the UK unprepared to cope with a crisis. This applies to failures in supply of personal protective equipment (PPE), establishing 'track and test' systems (now outsourced to private sector contractors), or the precarious employment of staff in the care home sector, which often led to temporary workers moving from one care home to another, and thereby increasing the risk of infection spread to highly vulnerable residents.

It also applies beyond the frontline health system to encompass, for example, how we have planned and managed our cities. As Parker et al. (2020) argue, throughout the latter part of the twentieth century, urban planning increasingly moved towards acting as a facilitator of market-led development aided by a 'delivery state' ethos. The consequences of the increasing privatisation of open and green spaces, poorly designed neighbourhoods, low quality housing, fast-track planning, and a focus on development, rather than on *places* and the *outcomes* of development, are sharply experienced during a health crisis emergency.

Fundamentally, the equilibrium approach does not allow for reform and transformation as a response to crisis, largely ignoring distributional and normative concerns in favour of aligning with or reinforcing existing power structures and relations. A 'bounceback quickly' approach also raises questions relating to the resilience of *whom*, particularly in terms of transferring risk to the individual. This is particularly the case when the rhetoric of resilience is translated to a social context with overtones of self-reliance, distrust in government, and the neoliberal promotion of individualisation of responsibility (Davoudi 2017).

2.2 Evolutionary Resilience

In contrast to equilibrium-based approaches, evolutionary resilience rejects the notion of single-state equilibrium or a 'return to normal', instead highlighting ongoing evolutionary change processes and emphasising adaptive behaviour and adaptability. These themes have been particularly explored within the evolutionary economic geography literature (e.g. see Bristow and Healy 2020). As outlined by Pike et al. (2010), an evolutionary analysis emphasises the 'path dependent unfolding of trajectories of change, shaped by historically inherited formal and informal institutions' (p. 62). Therefore, a key departure point in this analysis is that development does not proceed along a single path, but along multiple pathways (some of which may be suboptimal). By embracing the inevitability of evolution, resilience thinking from this perspective emphasises the role of *adaptation* as a response to shocks and disturbances, enabling a more optimistic and potentially more radical notion of resilience. In summary, 'bouncing back' to a perceived normal state following a shock need not be the only response. Instead, evolutionary resilience places significance on *transformation*, whereby social systems (through individual or collective agency) can adapt or search for and develop alternative development trajectories.

Drawing on Pike et al. (2010) and Faulkner et al. (2020), the key advantages of an evolutionary resilience perspective in understanding the impact of COVID-19 is its potential to reveal:

- The *vulnerability* or *exposure* of a system to a crisis and the *capacity to respond* is related to 'pre-shock' properties of a system, such as leadership and institutional effectiveness. Therefore, a crisis can be experienced very differently across diverse political and social systems, reflecting highly variable system *sensitivity*.
- Shocks or sudden ruptures are *intertwined* with 'the unfolding of broader, longer-run and slow burn processes' (Pike et al. 2010, p. 63), including long-term socio-spatial and economic restructuring processes. For example, how does the COVID-19 crisis intersect with entrenched processes of social exclusion or institutional racism?
- *Path dependencies* are central in shaping resilience, adaptation, and adaptability, which may be weakened by entrenched path dependencies. For example, how did COVID-19 overlap with past decisions that strengthened or weakened capacity to cope with the crisis, such as reducing intensive care unit capacity, models of care provision for older people, or deepening market penetration into health systems.
- '*Locked-in*' development paths compromise resilience, whereby formal and informal institutional culture and relationships may inhibit adaptive behaviour and capacity. Similarly, the process of 'de-locking' may be central in path creation and transition towards a more resilient or healthy future.

3   Discussion

Resilience has become a much-debated concept within social sciences over the last decade, as ideas around ecological resilience have been increasingly transferred to debates surrounding how societies cope or respond to a crisis and uncertain risks in an increasingly interconnected world. Although 'bounceback' resilience appears conservative and a 'business as usual' response to a crisis such as COVID-19, the evolutionary approach to resilience potentially provides a more transformative and therefore empowering agenda that questions a return to normal. In this context, an evolutionary approach offers an insightful analytical framework for understanding how past decisions, development paths, and institutional capacity can build or erode resilience when faced with a crisis. This enables us to question suboptimal development paths that may become locked-in due to entrenched interests, support for the status-quo, an absence of leadership and adaptive capacity, or a loss of collective agency.

However, the evolutionary approach also has limitations. For example, transformation rather than a return to normal may also result in negative trajectories and may instead lead to maladaptation of a system to perceived or actual risks. For example, in the short term, the COVID-19 crisis is likely to lead to widespread

behavioural shifts in how we interact with and within our cities and regions. The pandemic 'shock' has the potential to lead to longer-term 'slow burn' changes that may be suboptimal in coping with future pandemics and ecological or economic crises. For example, at an urban scale, the future of mobility and urban density have quickly emerged as key debates, with wider impacts relating to the spatial organisation of the city. For example, how will the pandemic reshape mobility patterns? Walking and cycling may see a surge, particularly *if* we prioritise new sustainable mobility infrastructure. However, will urban public transport recover if we continue to be at risk from COVID-19 or will people 'cocoon' in a daily commute in a private car (for those with a choice)? As many people who can work from home have been doing so for some months, will this lead to a longer-term shift to homeworking, and what are the implications for commuting patterns or for the provision of office space in our towns and cities? Will city residents still want to live in densely populated areas or prefer to move to smaller towns or less dense suburbs? Urban density will possibly be reframed by its opponents as a public health issue, or 'consumers' may seek less dense or exurban locations for housing, particularly to consume more private indoor (including a new home office) and outdoor space. If demand for office space declines alongside the continuing demise of high street retail and the expected negative impacts of the crisis on the restaurant/entertainment sector, what functions will our urban centres have? Exploring how to capture this moment for a positive transformation (rather than a return to 'normal' or maladaptation) seems a critical challenge, and reconnecting 'place' with public health goals and outcomes would seem a useful departure point.

4   Conclusion

The growing interest in resilience over the last decade is tied to an increasing sense of risk and uncertainty as policymakers are faced with systemic and often interlocking challenges, from climate change to economic instability and more recently, a global pandemic and public health crisis. This chapter has primarily explored resilience in the context of 'place-based' responses to highlight the interconnectedness between individual behavioural shifts, governance, markets, and uneven spatial change. The utility of evolutionary resilience thinking is twofold: firstly, it provides a useful analytical framework for understanding the uneven impacts of a crisis and how these relate to path-dependent processes. Secondly, it provides a useful conceptual framing of policy that questions a 'return to normal' and instead focuses on an evolutionary *transition* to a more sustainable or healthier society focused on adaptation. In this context, a number of themes are currently under-researched in the literature and require further attention. Firstly, there needs to be an increasing focus on examining resilience-in-practice, particularly in relation to governance practices that enable the performance of resilience. Secondly, while health has often been treated as a sectoral concern, more research is needed to examine how health can be mainstreamed within place-based approaches to building

resilience, particularly in connecting health, ecological integrity, and urban systems of decision-making and risk management. Finally, more attention should be focused on understanding the role of entrenched interests in undermining a transformation towards a more resilient society. Who benefits from a 'bounceback quickly' rather than a 'build back better' approach in the wake of a crisis?

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Chapter 15
Managing Internationally Mobile Bodies in a World on Hold: Migration, Tourism, and Biological Citizenship in the Context of COVID-19

Meghann Ormond

1 Flows and Frictions of Disease

Health geographers like me who study international medical travel—where people cross international borders for medical treatment not (perceived as) accessible in their regular countries of residence—have focused largely on internationally mobile patients with *non-communicable* diseases and ailments, as well as the diverse commercial and governmental bodies worldwide that welcome them as lucrative, non-threatening, short-term care consumers ('medical tourists'). Such international mobility can be interpreted as a manifestation of transnational 'biological citizenship' (Rose and Novas 2004), where the biological functioning of one's body becomes increasingly central to one's individual and collective identities, generating novel spatio-relational configurations of care demands, resources, and economies that transcend the confines of a single nation-state (Ormond and Kaspar 2018). By contrast, the configurations of care and protection forming around the 'biological citizenship' of people (potentially) with *communicable* diseases manifest very differently, especially when borders are involved. For centuries, authorities of polities—cities in earlier times and, in modern times, also nation-states—have deployed disease-control strategies that entail monitoring people travelling into their territories, their points of departure, and the nature of their (human and more-than-human) encounters along the way for (detectable symptoms of) communicable diseases classified over time as public health threats, eventually isolating those (potentially) infected in quarantine, barring their entry or deporting them. These attempts at rendering the otherwise 'invisible enemies' of contagion visible, controllable, and expungable have relied on exclusionary bordering practices, such as the drawing of

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sanitary cordons to isolate and protect inhabitants' health and the placing of movement restrictions on specific mobile populations suspected to be more prone to carrying communicable disease from one polity to another (Tognotti 2013). The contrast between mobile bodies framed—whether individually or collectively—as either biologically non-threatening or threatening and the diverse bordering practices enacted in response to them reflects the highly conditional nature of hospitality to and protection of vulnerable Others extended by nation-state authorities, whose legitimacy is in part predicated on protecting and caring for those 'legitimately' residing within their national borders.

The novelty and severity of COVID-19 and the ease with which it is presently understood to be transmitted led to the rapid imposition by national governments of far-reaching, unprecedented international travel restrictions in the first half of 2020 throughout the world. Such restrictions meant that the 'biological citizenship' from which paying patients with non-threatening non-communicable conditions had previously benefited in order to move across borders for treatment had been trumped, from one day to the next, by the potential threat of their bodies—of *every* body, with extraordinarily limited exception—being exposed to and becoming vectors for the international spread of COVID-19. Indeed, national governments around the world seeking to stem the growth of COVID-19 were forced to quickly scramble to establish 'a new matrix to distinguish risky and unnecessary mobilities from those considered necessary and legitimate' (Scheel 2020) based on little more than a tenuous grasp of COVID-19's functioning. It is on these reactive 'scramblings' by national governments to distinguish between 'essential'/'legitimate' and 'non-essential'/'illegitimate' international mobilities in the first half of 2020 and the quandaries they encountered in drawing such distinctions that I wish to focus the remainder of this brief chapter.

2   Bubbles, Air Bridges, and Tourist Corridors

Despite globalization, modern nation-states largely remain containers for their inhabitants' health and welfare needs. Therefore, each national government during the pandemic has been responsible for developing its own approach to COVID-19's containment. While national strategies for the internal management of the pandemic evidenced significant degrees of diversity (e.g. the differences between the Netherland's 'intelligent lockdown', Sweden's 'lax approach', and China's 'authoritarian approach'), every national government throughout the world opted to introduce some form of restriction on international mobility to contain the spread of COVID-19. Most governments around the world rapidly closed borders to all 'non-essential' international mobility (e.g. all forms of tourism and most forms of migration), creating novel challenges. Many national borders, over decades and throughout much of the world, for instance, had been so extensively worn down or fragmented in order to facilitate supra-national regional and global 'free market' flows of people, goods, and services that some national governments—like many of the

Schengen Treaty signatories that had not closed their borders since the 1970s—suddenly had to reinvest national physical borders with separating and closing functions once again on a large scale.

Yet, while national governments rushed to snap borders shut, many quickly came to recognize the dire economic and social challenges posed by the sudden immobilization of the international flows of people, goods, and services on which their populations had come to heavily rely. Tourism, for example, is vital to many countries' economies, with tourism revenue accounting for 10% of global GDP and employment (WTTC 2020). The once-bustling hotels, shops, and thoroughfares emptied by COVID-19 lockdowns revealed at once the economic significance of the travel and tourism sector for destinations and the extraordinary precarity of the small businesses and low-wage labour on which the sector relies in fluctuating geopolitical times. Consequently, governments were desperate to develop lockdown exit strategies to allow source and receiving countries to ease or lift travel restrictions as quickly as possible. European Union (EU) member-states, for instance, frantic to 'save the summer', entered into bi- and multilateral pacts to set up 'tourist corridors', 'bubbles', and 'air bridges' between EU countries that need not share physical borders but, instead, must demonstrate declining rates of contagion (indeed, even 'COVID-19 immunity passports' were mooted) and enforce hygienic strategies for keeping destinations clean and safe (BBC 2020). While these bordering practices may not be especially novel (consider, e.g. bilateral tourist corridor pacts between socialist countries during the Cold War (Kaspar 1981)), the adjustments to different countries' legal, infrastructure, and technological capabilities to enable contact tracing in these newly established zones are novel (Shachar 2020). COVID-19's threat of catastrophic economic effects on international tourism-dependent national economies, hence, has led to significant scrambling by governments to rapidly de-territorialize and re-territorialize supra-national economic regions and zones based not only on their ever-changing grasp of the elusive nature of COVID-19's communicability (e.g. the potential to acquire immunity and the length of time one might be immune) and accessibility of technology but also on their populaces' biological conditions disciplined by different national variants of 'lockdown' policing and governmentality.

At the same time, it is worth paying attention to the exceptions that emerged at a time when uniform application of restrictions on all 'non-essential' international mobility based on prospective travellers' countries of residence appeared to be the norm. While national governments gradually began to open their borders up in mid-2020 to international mass tourists from specific countries considered sufficiently 'low risk', certain categories of people whose biological conditions and financial dealings qualified their international mobility as 'legitimate' (read 'lucrative')—like 'medical tourists' and business travellers—were able to flout travel restrictions for the masses. Thailand, for instance, rapidly restored entry to both of these niche tourism categories while only partially lifting restrictions on the far larger volumes of regular leisure-seeking tourists (Reuters 2020). Such exceptionalism offers useful perspective on how embodied 'risk' is imagined, evolves, and gets differentially attributed and practised by national governments engaging in

crunch-time calculus of 'the greater good', where public health interests are weighed up against diverse and influential economic interests.

3   Valuing Migrants in a World on Hold

The suddenness of national governments' lockdown decisions around the world caught many internationally mobile people unprepared. While hundreds of thousands of international tourists were stuck in their travel destinations, leading to costly repatriation efforts by their source country governments, hundreds of *millions* of international migrants, by contrast, were faced with far more dire challenges. The ease with which COVID-19 spreads posed significant threat to people with irregular status and seeking asylum in overcrowded, unhygienic housing, detention centres, camps, and informal overflow sites. The lockdowns furthermore had drastic consequences on lives both in immigrants' source and receiving countries. Legalization processes were stalled, and many immigrants—concentrated in 'essential' yet precarious, low-wage jobs with limited access to protective measures—lost their jobs. Unable to work, many were stranded in receiving countries, with little to no social safety net offered either by their passport countries' governments or by (former) employers or social systems in their receiving countries. Meanwhile, at the macro level, global remittances—valued for reducing poverty and quelling social and political discontent in lower-income countries—were expected to drop dramatically, leading source country governments around the world to appeal to their immigrant diasporas to continue sending vital funds (Semple 2020).

COVID-19 furthermore shines an important light on the long-standing link between public health fears and discrimination, with poor people, ethnic and religious minorities, and immigrants frequently targeted, scapegoated, and isolated as (potential) communicable disease vectors. Indeed, some governments, like those in the United States and Malaysia, used COVID-19 to dispose of irregular immigrants, framing them as vectors of contagion, clamping down on irregular migration, increasing deportation rates, flouting international law, and turning away asylum-seekers at their borders. Not all governments resorted to the old exclusionary bordering practices, however. Some turned to more inclusive ones, temporarily reclassifying 'disposable' migrants pre-COVID-19 as 'necessary' and entitled to participate in systems from which they had previously been formally excluded. Temporary regularization campaigns in countries like Portugal and Italy, for example, enabled hundreds of thousands with irregular immigration status both to work and to access health care without fear of detention and deportation. Not only was their economic contribution to these countries' care and agricultural sectors recognized as vital to national social welfare and economic stability, but also their 'biological citizenship' was recognized. Their legal identities were transformed—albeit temporarily—on the basis of non-exclusionary public health policy that recognized

including them within a biologically vulnerable population was safer for 'the greater good' than excluding them.

4   Conclusion

This chapter focused on national governments' 'scramblings' at a moment of unprecedented crisis to manage different forms of international mobility on which they have grown increasingly dependent over the last decades. In deploying Rose and Novas's (2004) concept of 'biological citizenship'—which highlights how people's biological conditions can become instrumental to their political identity and capacities for demanding recognition and receiving protection and care—as a lens through which to explore how the COVID-19 pandemic offers new perspective on age-old political dilemmas of controlling the spread of contagion and its management, I brought into focus novel spatio-relational configurations of 'biological trust' in the form of bubbles, bridges, and corridors; biological risk loopholes; and biologically inclusive immigrant regularization policies. In a time where a 'new normal' future seems inevitable, with COVID-19 and the threat of other new viruses looming large, it is key to develop lines of research that explore what governmental actors have learned, and continue to learn, about bordering, distancing and segregating bodies from their national, bilateral and multilateral 'scramblings' to respond to the dramatically disorientating dilemmas induced by COVID-19's emergence. Given many national and local receiving contexts' seemingly new-found awareness of their extraordinary dependence on international tourists and migrants, it is likewise urgent to pay attention to the discourses, techniques, and technologies through which tourists and migrants' shifting individual biological conditions are being, and will in the future be, perceived, measured, reported, and scrutinized, as well as the ways in which such data will circulate, within and across borders to facilitate or inhibit increasingly personalized international mobility. It will be vital to make increasingly visible the ways in which our biological identities articulate with our political identities in an ever-more globalized world.

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Chapter 16
Mobility Is Dead: Post-pandemic Planning as an Opportunity to Prioritize Sustainability and Accessibility

Justin Spinney

1 Introduction

The subject of this chapter sits across the boundary of transport geography and what has been termed the 'mobilities turn'; a paradigmatic shift across the social sciences that has sought to explore various lacuna related to mobility. Of particular interest to me have been relative absences including inequalities, embodied experiences, and political economy of mobility, all of which invite us to theorize mobilities and immobilities as actively produced, unevenly distributed and experienced differentially. Inspired by this agenda, over the last 15 years my research interests have been centred around everyday 'transport' mobility, specifically cycling. Within this, I am most interested in the political economy of cycling: trying to understand how, why, in what forms, and with what implications cycling has been brought back into towns and cities, and how this reflects the demands and developments of capitalist systems of accumulation.

Drawing upon these interests, this chapter gives me an opportunity to reflect upon the challenges and opportunities posed by the COVID-19 pandemic. I make the argument here that in a world where everyday mobility is directly implicated in the transmission of disease vectors (Budd et al. 2011; Gutiérrez et al. 2020), cycling more than ever has a role to play, but it is a role that will only be realized if we meet the bigger challenge of rearranging our towns and cities to minimize the need for mobility by increasing accessibility. Whilst there is much to say about mobility in different areas of the world, given word constraints this chapter limits itself to reflecting on everyday mobility in Britain.

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2   Where Are We Now?

As a result of the global spread of the COVID-19 (coronavirus), 'lockdown' measures in Britain (including shop and workplace closures, restrictions on exercise, group sports, face-to-face meetings, and domestic and international travel) came into effect on March 26. These measures were subsequently extended on April 16, May 7, and May 28 (Haddon and Nice 2020). Mobility (at least the 'right' kinds in the 'right' places) went almost overnight from something associated with affluence and freedom to something that was dangerous, abnormal, and socially undesirable.

The British Prime Minister set out details for conditional easing of lockdown measures in England on May 10, 2020. As devolved administrations have responsibility for lifting of restrictions, the timetable and requirements for easing have differed in Scotland and Wales. In England, from May 11 the public were allowed unlimited exercise, could play sports within households, drive to other destinations, and encouraged to go back to work. From June 1, people could leave their homes for any reason, small groups could meet outside, outdoor markets could reopen, and some children returned to school on a part-time basis. From July 4, small meetings in the home were allowed; pubs, restaurants, hairdressers, gyms, museums, cinemas, libraries, camp sites, and many other places could reopen if adhering to social distancing and PPE requirements (Haddon and Nice 2020). Despite this, at the time of writing (early August 2020) many music venues, theatres, cinemas, and pubs remain closed. At the time of revising (November/December 2020), these venues remain closed with limited or no possibility of reopening in the near future.

Reflecting the importance of everyday mobility to accessing shops, workplaces, and services in the UK, patterns of transport use have mirrored the implementation and easing of lockdown measures. This is illustrated by Department for Transport (DfT) statistics (see Fig. 16.1). These show a gradual decline in public and private transport use prior to lockdown as users became more aware of COVID-19 and many began to self-exclude from activities (such as taking children to school and activities; using public transport) prior to official closure. There is a further steep decline in all modes after lockdown measures are implemented on March 26. Of all motorized vehicles, Heavy Goods Vehicles (HGVs) saw the smallest decline, reflecting the fact that the movement of people rather than goods has been targeted by lockdown measures. What is particularly striking is that as lockdown measures have been eased, private transport use has picked up much quicker than public transport. Whilst private car use had returned to near pre-lockdown levels by early July 2020, use of national rail, bus, and London's tube network remains at a fraction of former levels (c.f Gutiérrez et al. 2020). The cycling figures (for England only) tell a different story, showing a modest increase for travel to work and much larger usage at the weekends for leisure purposes. One thing is clear from the data though; a lot of trips—at least for the near future—have disappeared or been replaced by virtual mobility, and of those journeys that have disappeared, most are public transport journeys.

Fig. 16.1 Usage of transportation modes in Britain from 1st March to end of July 2020. (Source: DfT 2020 - Derived from DfT statistics: https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic)

There are many stories that might be told and foretold from this data. The majority of citizens we are told, do not want a return to normal, though detail on which bits of normal we wish to retain seems scarce (Binding 2020). Related to this 'desire' for a new normal, media and commentators have been quick to jump on the cycling increases during lockdown as evidence of the public's newfound willingness to embrace cycling (Burns 2020), even though the evidence suggests the public's desire remains strongest for leisure cycling and that cars remain king. Likewise, there have been numerous stories regarding the long-term environmental and economic implications of the downturn in public transport patronage suggesting a permanent fall of 20% in demand (Moran 2020). In parallel to stories about the demise of PT are those that see within this an opportunity to smarten the city: the streets of the future we are told are littered with self-driving cars and automated delivery robots (Shaikh 2020). Gutiérrez et al. (2020) for example suggest that as part of their response, transport operators will need to 'incorporate the latest technologies' (3). These are interesting narratives, but they all share the same underlying desire to return to 'normal' levels of mobility even if the means through which this is achieved might change. What I want to reflect on in the remainder of this piece is the need—in a post-pandemic world—to prioritize accessibility and justice over mobility, something that is seemingly being glossed over in the rush to re-invent the wheel.

Of the many stories that remain hidden in the post-pandemic transport data and commentaries, is the issue of inequality. Whilst much general news coverage has been given over to the ways in which existing social identities and risk factors are reinforcing health inequalities, less has been said about this in relation to mobility. This is perhaps unsurprising given the aggregate nature of the DfT data which tends to hide differences around the differential levels of risk borne by those using

transport. Whilst many people remain working from home, it is clear that those working in particular sectors such as retail, hospitality, care, and domestic services are being exposed to greater risks when travelling. As lockdown measures have eased, those working in such jobs are more likely to have had to travel to a physical place of work such as shops, hotels, and the homes of others in order to undertake their job (Blundell et al. 2020). There is a clear correlation between rising income and the likelihood of being able to work from home (ibid). Moreover, many of those working in these sectors (and therefore having to travel) are less likely to own a car and more reliant on public transport which has been shown to be a disease vector in the pandemic (Buja et al. 2020). Again, the risks to them with regard to COVID-19 are heightened because of this. What is clear is that the current situation is exacerbating pre-existing inequalities with women, those with impairments, the low paid, and ethnic minorities over-represented in those having to take public transport and therefore being exposed to greater risk of transmission of coronavirus (Improvement Service 2020, p. 8). The point I wish to emphasize here is that whatever version of 'normal' transport we return to (and the prognosis is not positive), it must take into account the needs and means of those who have no choice but to move to fulfil the basic requirements of social reproduction.

3   Mobility Is Dead: Long Live Accessibility

Of course one way around the current inability of public transport to meet demands for mobility safely and equitably is to present walking and cycling as an alternative; if only we had safer routes for cycling we could capitalize on the new found love of cycling and everything will be alright, or so the story goes. With this in mind the British government has announced a £2 billion package of spending on cycling over the next 5 years. This will include emergency cycle lanes, vouchers for cycle repair, and higher standards for infrastructure (Gov. UK 2020). The elephant in the room in such initiatives is that our land use patterns have emerged around the capabilities of motorized vehicles and these actively militate against walking and cycling as viable options because of the distances involved and low environmental quality. The 'boost' given to walking and cycling will amount to very little if the distances, zoning, design codes, and topography of towns and cities remain the same. Decent cycle lanes for example mean very little when you are trying to take three children to after-school activities in disparate locations at different times; for those who can access one, the car remains king in such situations.

So, what might we do instead? In the short and medium term at least, people have different access needs; many things that used to require physical movements to achieve now do not. Where physical movement is still required, many people cannot or will not use public transportation to achieve this. Therefore, much of our commercial, residential, and transport infrastructure is now redundant; in the wrong places and in the wrong quantities, it is no longer serving its purpose. Faced with the unpalatable options of (permanently) subsidizing public transportation;

encouraging private car use; or not moving humans at all, the obvious solution is to change the spatial arrangements of towns and cities so that these 'choices' no longer need to be made. In many ways the issue at stake here is nothing new. Successive British (and indeed probably all) governments have conflated mobility and accessibility, attempting to overcome the poor arrangement of urban areas by increasing mobility. However, COVID-19 has thrown the folly of this into view; either unable to move at all or to utilize public transport, many services and destinations are now either not accessible or only accessible by private car. As a result, we need more urgently than ever to rethink urban forms to reduce the need for public and private motorized transport.

What this brings into sharp relief is that the most crucial consideration in the near term is to change regulations to ensure that land can be rezoned quickly and effectively so that retail, work places, meeting places, health services, and activity centres are more dispersed amongst residences (both social and marketized) and concentrated at public transport interchanges where public transport, Mobility as a Service, and active travel all intersect. What is required is nothing less than a wholesale renovation of these intersecting infrastructures to make them fit for purpose: down-sizing, relocating, and re-directing (c.f Beatley 2000 on urban form). Such a policy also has a number of other benefits; it will help reverse the danger to public life posed by the retreat from both public transport and public space—witnessed in the decimation of high streets and town centres. The higher uptake of walking and cycling through re-designed urban areas can also help to give a much-needed boost to mental health (as well as physical health through open air social distancing) by boosting physical activity.

None of this is to say that the case for reducing mobility in favour of accessibility was not adequately made prior to COVID-19: the case for different land use patterns that minimize the amount of mobility required to achieve access has been well made for many years (Curtis 2011; Vale and Saraiva 2016). The precipitous drop in mobility and inability of public transport to meet the shift in needs wrought by COVID-19 has simply expedited the need for spatial arrangements that enable maximum access to be achieved by the most disadvantaged through the minimum of mobility (Martens 2017).

Beyond the quick fixes currently being thrown about, the more difficult, sustainable, just, human-scale, and long-term solution is to invest in changing the shape, size, composition, and layout of towns and cities to limit the demand for mobility; and to increase the likelihood that what mobility is required can be satisfied through sustainable and active modes. In such scenarios, less public transport and use of private cars will be required because distances will be shorter. Likewise, walking and cycling will become more appealing as services are brought within easier reach of residences. What is not required are the British government's recently announced plans to fast track the building of homes on all land designated for 'growth' (Hurst 2020). Such an approach is likely to lead to more sprawled layouts, less integration with transport and other services, less consultation, and even worse conditions for walking and cycling. Such a policy will necessitate even more (auto)mobility to achieve access, not less.

If we are to shrink rather than exacerbate existing health and mobility inequalities (c.f Lucas et al. 2019) in a post-pandemic world, we need to first consider how we arrange our towns and cities; by changing their arrangement we can ensure that the accessibility of both present and future generations is prioritized to mitigate the risk of future pandemics and maximize equity, as well as address longer-term problems of climate change that excess mobility has contributed to. Accordingly, the mobilities turn has much to offer in setting and contributing to an agenda that seeks to understand differences with regard to changes in mobility and working practices; and in particular to ensure that solutions proposed are just, and do not simply favour the new lifestyles of those who have already achieved maximal access through home working.

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Chapter 17
Media and Information in Times of Crisis: The Case of the COVID-19 Infodemic

Yossi David and Elisabeth Sommerlad

1   Introduction

Media and communication studies is an interdisciplinary field that is founded mainly in the social sciences. It focuses on the representation, use, and effects of media discourses and technologies on individuals, groups, and nations in different aspects of everyday life and crises. The increased popularity and importance of media and communication technologies in modern life has emphasized the need to study how the media can help us better understand politics, sociology, culture, economy, psychology, international relations, and geography. Media and communication geography aims to bridge the gap between both media and communication studies and geography by focusing on the interaction between media, space, and society. Media and communication geography focuses on mediated spaces and places, as well as on space and place components of media itself. It provides a processual perspective on media and communication as spatial constructions, while at the same time maintaining a multidimensional perspective on space and spatial mechanisms as both a cause and effect of communication and mediated communication processes (Adams and Jansson 2012). The interdisciplinary nature of both fields and the increased popularity of mass media and media technologies have led to a "spatial turn" in media and communication studies and a "medial turn" in geography. While geography focuses on the role of spaces and places, media and communication highlights the role of mediated discourses and technologies.

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This interdisciplinary paper will first address the role of media in times of crisis and the importance and dangers of digital media. Second, we will discuss the role of homogenous media coverage and public opinion. Finally, we will examine the implications of the role of media and information during the COVID-19 era.

2 Media and Information in Times of Crisis

Media play an important role in informing the public about issues on the political agenda, as well as different opinions and public statements. Societal and political uncertainties during times of crisis enhance the need for information and, as such, increase the importance of media discourses and technologies. Studies of crises have found an ethnocentric bias in media coverage (Wolfsfeld et al. 2008) and an increase in negative emotions and hawkish attitudes in public opinion (David et al. 2018). During stable times, legacy and new media technologies are used mainly as a source of information (Entman 2003; Katsabian in press; Middleton et al. 2013). However, in times of crisis, they may be (ab)used in order to police, indoctrinate, and intimidate the public. They may even be used as a weapon (Kampf and Liebes 2013; Singer and Brooking 2018).

Media discourses and frames can be used to shape public opinion (Entman 2003; Shamir and Shamir 2000), emotions (David et al. 2018; Powell et al. 2015), and actions (Antilla 2010; David 2021). Previous research has highlighted the importance of legacy and new media in times of crisis, such as natural disasters (Middleton et al. 2013; Sood et al. 1987), wars (Powell et al. 2015), and terrorist attacks (Entman 2003; Kampf and Liebes 2013; Singer and Brooking 2018). Some examples include increases in hate speech, sexism, and xenophobic ideologies, as well as increased support for human rights violations, perceptions of international relations as a zero-sum game, and ethnocentric perceptions and actions. During these times, the media and public change their behavior by withholding disagreement and criticism, tending to "rally 'round the flag," adhere uncritically to instructions that governmental and public institutions issue in the name of the common good (Mueller 1970). During crises, there is also an increased risk of the media being used as a weapon (Kampf and Liebes 2013; Singer and Brooking 2018).

Ethnocentric bias in time of crises is characterized on the one hand by increased solidarity towards the in-group, and on the other by increasing hatred, discrimination, and violence against those who are perceived as out-groups (Wolfsfeld et al. 2008). Ethnocentric bias leads to a binary perception of the relationship between in-groups and out-groups and to a categorization of the world in the form of "us" vs. "them." This perspective is assembled when existing social constructions, such as gender, race, and ethnicity, lead to an interactive effect with media and information on emotions, attitudes, and actions. The phenomenon of "rallying 'round the flag" (Mueller 1970) has both positive and negative aspects. Some of the positives include increased empathy towards fellow nation(al) or region(al) residents and increased solidarity. Among the negative components are an increase in ethnocentrism and a

tendency to ignore the danger of not criticizing the actions and decisions a government takes that affect its citizens' and residents' lives.

The process of weaponizing media discourses and technologies has a long and varied history (from propaganda and misinformation to cyber-attacks). Media can also serve as a channel for self-proclaimed—and often populist—counter-media, as well as the spreading of hatred and intolerance (Baden and Tenenboim-Weinblatt 2017; Kampf and Liebes 2013; Wolfsfeld et al. 2008). New media might be used as a weapon to disseminate misinformation, spread intimidating and threatening messages, and demoralize opponents (Singer and Brooking 2018). The rise of digital technologies and new digital spaces has, therefore, created and established new channels of information flow. Digital media technologies themselves might also serve as a weapon, since digitizing civilian and governmental infrastructure makes those infrastructures more vulnerable to cyber-attacks.

In democratic societies, media often publicize reliable, fact-checked information, helping people make informed and knowledgeable decisions. This is indeed a crucial precondition for the functionality of democratic societies. Therefore, two of the key components for a functional media landscape are a legal anchoring in freedom of the press and a degree of independence from the state, i.e., ensuring the state does not regulate the media (and information) via either direct ownership of media channels or indirect regulation and mechanisms of censorship and control. One possible policy that could undermine these key components is the declaration of a state of emergency, which reduces human rights (e.g., freedom of movement, expression, and the press). Such rules are sometimes officially enforced through censorship or indirectly by the creation of a conformist climate of opinion (Shamir and Shamir 2000) that leads to public self-censorship in the name of the common good (Antilla 2010).

Building on the abovementioned literature related to the role of media and information during times of crisis, we propose a conceptual model (see Fig. 17.1, below) of the effect that media and information have on public opinion and actions during crises. The model aims to describe the direct and indirect roles that media,

Fig. 17.1 Media and information in times of COVID-19

information, and social constructions play in shaping emotions, attitudes, and actions. We argue that social constructions influence emotions, attitudes, and actions, which are all intercorrelated. At the same time, media and information flow moderates or reinforces the intercorrelations between these different factors. Sociological and psychological processes during times of crisis are shaped by the intersection of time and space. At the intersection of these framing phenomena, any crisis that occurs (in our case, COVID-19) influences our actions directly but also through other factors, emotions, and attitudes. This effect is, in turn, mediated by media and information flow. We offer this model in order to help launch a scholarly debate on the effects of media, information, and social constructions on social actions, through emotions and attitudes.

3   Media and Information During the COVID-19 Infodemic

Often, the effects of media and information on the actions of individuals and groups are indirect, being carried out through a reinforcement or moderation of existing perceptions, beliefs, and attitudes. While COVID-19 is a viral disease that does not distinguish between groups, people from social minorities have lower socioeconomic status, and as such, they often cannot perform their jobs from home. This is one way that social constructions create situations in which different groups have different levels of risk of COVID-19 infection. Individuals' ability to detect fake news and disinformation is also influenced by social constructions (e.g., people who adhere to extreme political orientations tend to believe more in conspiracy theories). Different groups are thus affected differently by both the epidemic and the associated infodemic.

The COVID-19 pandemic is a health crisis, but it is at the same time a crisis of information—one which has created an overabundance of information and misinformation that has in turn constructed a global infodemic. As we suggest in our model (Fig. 17.1), social constructions influence actions, emotions, and attitudes. At the same time, media and information have a reinforcing or moderating influence on the effects of these different factors. Moreover, the effect of each of the predicators also depends on where it falls on the COVID-19 timeline (starting with the outbreak of the epidemic) and the space in which it occurs (e.g., the country, city, or neighborhood).

In the context of the COVID-19 infodemic, we have witnessed various attempts by both democratic and authoritarian regimes to increase control over the flow of media and information and to control information regarding the spread of the virus. One important function of the media was to act as mouthpieces for the governmental and public institutions that issued declarations of states of emergency, which resulted in additional regulations limiting press freedom and freedom in general. These enforced restrictions on the media have been met with, among other things, allegations of fake news, public risk, and censorship.

The effect of "rallying 'round the flag" was ubiquitous during the outbreak and spread of COVID-19 and manifested in the form of journalists and media outlets deciding to be responsible and thus support the measures announced by governments and health organizations worldwide. This decision led to media homogeneity and an overwhelming media support for governmental and health organizations' regulations around the world (e.g., in Germany, Israel, and Sweden). As in previous crises, the overwhelming and full-throated support offered by different media outlets led to the successful implementation of government and health organizations' instructions related to the COVID-19 pandemic. This support may have a positive influence, as it has helped prevent the spread of the virus, save lives, and increase solidarity within the in-group. Nonetheless, it also has negative effects, since it encourages ethnocentrism, discrimination, xenophobia, and hatred towards outgroups. A prominent example is the stereotyping of and discrimination against ethnic minorities (e.g., people identified as "Chinese-looking"), gender minorities (e.g., LGBT individuals who have been denigrated in some countries for spreading the virus), and a zero-sum game perception of international relations.

Relatedly, there have been further violations of human rights during the COVID-19 infodemic. The implementation and use of technologies to slow down the spread of COVID-19 by tracking, monitoring, and mapping citizens' movements, for example, might lead to human rights violations. This highlights the legal and ethical questions related to the conditions under which it is (im)possible to use such tracking technologies, and how we can prevent human rights violations caused by the misuse or abuse of these technologies. We critically ask: What kind of regulations are needed in order to prevent the (ab)use of media and information to violate human rights? How does the knowledge that such monitoring technologies exist affect self-discipline, social and political behavior, and spatial practices? Which measures are needed to prevent the use of monitoring technologies for other purposes, such as the detection of undocumented immigrants or the criminalization of minorities?

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Chapter 18
The (Social Distanced) Circle of Family, Friends, and Allies: How COVID-19 Is Re-shaping Social Capital and New Opportunities for Research

Amber L. Pearson

1   COVID-19 Changes the Ways We Interact

In March 2020, the World Health Organization (WHO) issued public guidelines for COVID-19 preventive measures, including (1) frequent handwashing; (2) social distancing; (3) avoiding touching one's face; (4) practicing respiratory hygiene; (5) seeking medical care for cough, fever, and difficulty breathing; and (6) following advice from your healthcare provider. Perhaps the most widely implemented policy at regional, state, and national scales were widespread stay-at-home orders and temporary closure of many businesses and air travel. These orders included directives to only leave home for essential items, to not congregate in groups, and to not come into close contact with people outside of your own home (6 ft). Thus, we are living in a time of inherent "social distance." The direct changes to everyday life have been numerous and the ripple effects far-reaching. The ways in which we interact with others when we have ventured outside the home have evolved and have often been characterized by limited contact and unease, and sometimes by fear, anger, and mistrust. These effects are compounded by the massive inequalities in COVID-19 infection and case fatality rates by geography and by ethnic and socioeconomic strata (e.g., within the Rust Belt of the USA, among African Americans and the Navajo, and in low-income neighborhoods). Changes in our everyday social interactions and the unequal effects of the pandemic afford the opportunity to re-evaluate old ways and re-imagine how new social conditions can be harnessed to benefit health and well-being equitably.

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These new ways of interacting with one another and as groups imply a potential shift in the central concepts of social capital: trust, group membership and activating social networks (for good and bad), and social isolation. The re-imagining and re-shaping of each of these concepts will be explored, in turn, in this chapter, and will be intertwined with implications for health and well-being. In closing, novel prospects for research, afforded by the pandemic, will be unearthed including the well-being benefits of non-human communities, an unprecedented "natural experiment," and the longer-term impacts of social change on health and social capital itself.

1.1 Trust

First, to control the pandemic, guidance has been issued by numerous agencies (e.g., WHO, Centers for Disease Control (CDC)) and by political officials and medical experts. Some guidance has subsequently been reversed as health researchers learn more about the transmission and viability of the virus. Some guidance has been altered due to political or economic pressure. For some, flip-flopping on guidance has lowered trust and increased feelings of uncertainty in estimates. For others who consider themselves to belong to a highly educated, science community, trust in health experts for guidance is part of their bonding social capital. But, for many, trust of the "experts" and "facts" has been low and harkens to debates on the validity of scientific estimates on climate change. Misinformation about the origins, prevention, and treatment options for COVID-19 has proliferated. Poignantly, with these societal divisions in trust emerged the pandemic's symbol of trust alliances: the mask. Donning or refusing a mask, thus, became a visual representation of trust, allegiance, and political and social group membership.

1.2 Group Membership

Second, the equal limitations on access to prestigious consumption (e.g., luxury clothing, travel to elite destinations, dining at exclusive venues, professionally styled hair and makeup) that are used as symbols of wealth (Sweet 2011), has left these forms of social stratification unavailable and de-mystified, or perhaps even obsolete. Without typical forms of social comparison, through consumptive behaviors, the lines with which we delineate who is "in" and who is "out" are less clear. While the more visible dimensions of social stratification diminished, the more invisible or hegemonic dimensions were entrenched. For example, many wealthy households left their primary, urban residences in hard hit cities like New York City, and retreated to their lake houses, cabins, and lodges in rural areas. In addition, those working in essential jobs (e.g., grocery stores, gas stations, aged care facilities) or held positions that do not permit working from home (i.e., not in an office setting), tend to be lower paid positions and are often held by people of color (van Dorn et al. 2020).

While groups of people were banned from congregating, still during the pandemic, social networks (both virtual and in-person) have been activated in ways that both reaffirm health and well-being and divide and harm. We witnessed thousands of people stand on their doorsteps or balconies and sit in their cars to clap, toot, and shout for the National Health Service (NHS), global healthcare, and frontline workers. We saw ubiquitous symbols of encouragement and unity in children's drawings of rainbows in windows and messages on skyscrapers in our largest cities. Membership in this group meant a social contract to abide by the rules to protect public health and the most vulnerable, to stay home, and to value those who could not stay home and were instead putting themselves in harm's way to protect the rest of us. In contrast, we also saw activation of social networks through anti-stay-at-home protests sweeping states like Michigan, including protesters wearing swastikas and confederate flags. We saw a rise in racism against Asians, both in political rhetoric and in acts of violence. President Trump labelled COVID-19 a "Chinese virus" (Mangan 2020), and has since pulled WHO funding, claiming that the Chinese have too much power. Perhaps, at least in part, from public, racist statements such as these, white supremacy and other alt-right groups have felt empowered to activate and act out. At the same moment that infections and COVID-related deaths laid bare deep-rooted inequalities, sprang a new surge in the Black Lives Matter (BLM) movement. Perhaps spurred by the ways in which COVID-19 has re-shaped our priorities and how society operates in everyday life, by the timing of far-right emblazoned behavior, by anti-Asian aggression, and by even more Black killings by the US police, global support for BLM proliferated to challenge macro-level structures. Record numbers of protestors from myriad ethnic and wealth groups participated in protests, spoke out, and showed philanthropic support, representing wide bridging of social capital (Kawachi and Berkman 2001). This form of social capital is an important lever to gain access to a "resource" to benefit group members, sometimes to overcome, extinguish, demolish, or right a social inequality in society.

Into the future, as a vaccine is circulated, we will need to, again, rely on the actions of the community to benefit members and society more broadly. For the first time in human history, we will need to collectively, as a planet, produce billions of doses of vaccine and distribute these at an affordable cost to an estimated 60% of earth's inhabitants to achieve herd immunity (Graham 2020), which could ironically be undermined by social networks that refuse vaccination (Reich 2018). Thus, the pandemic period has become a pivotal moment in history, whereby group membership has been activated on a smaller scale to both harm and divide, and on a much larger scale to reaffirm health and claim equitable access to resources, free from discrimination, to lead a healthy, full life.

1.3   Social Isolation

Third, dimensions of social isolation have been re-shaped through the pandemic. In an effort to protect vulnerable older age groups, nursing and aged care facilities have been closed to the public. Likewise, hospital maternity wards and cancer treatment centers have restricted visitations and support people. While these policies are designed to protect vulnerable groups and limit the spread of COVID-19, they have left the elderly, vulnerable, and/or immune compromised isolated. Family members have visited, said their good-byes, or welcomed a new member through hospital windows or on video chat. As a prevention measure, schools ceased in-person teaching, relegating teaching responsibilities to parents and carers. As schools begin to return to in-person teaching, restrictions are still in place requiring social distancing, meaning that children cannot interact, play or touch as they would as part of their normal motor and social skill development. Many people with young children are concerned about the longer-term effects on development, if these restrictions continue into their childhood. While these limitations on physical contact abound, many have turned to aspatial communities to mitigate isolation and augment social connection. Social media platforms have been ubiquitous for work, leisure, news, and even connecting with proximal contacts. Trivia night with the neighbors is now on video chat platforms, possibly reducing isolation for some. Social connection is not trivial because strong ties provide "a sense of belongingness and general social identity, which sociological theorists have argued as being relevant for the promotion of psychological well-being" (Kawachi and Berkman 2001, p. 463). For some, however, the digital divide means that those with lower or non-existent internet bandwidth, or information and communication technologies (e.g., smart phone) struggle to teach their children at home, engage in meaningful social interaction with family during crises or celebration, and also miss the everyday social interactions that make us feel connected to those around us. In fact, data from 20 million mobile devices suggests that the combination of having both high income and high speed internet may be the largest driver of propensity to stay at home and ability to self-isolate during COVID-19 (Chiou and Tucker 2020). Social isolation, thus, in some ways represents the opposite of social capital, as engagement in group membership and, in turn, the ability to secure "resources" to benefit group members, is stifled. And the threats of isolation include increased risk of COVID-19 infection.

2   New Directions

The exact pathways through which social capital and its key ingredients prolong or improve quality of life are often complex and unclear, with increasing light shone on built environment and social policy pathways (Dorling 2015) and through embodiment (Krieger 2001). In light of the re-shaping of trust, group membership, and social isolation, some new directions in research are likely to emerge. These

directions may extend the pathways through which social capital influences health to include the natural environment and connections with non-human species.

First, changes to the ways we interact with others (or the lack thereof) have drawn renewed attention to non-human species and our sense of connection to them, perhaps as a planetary community. For example, with less air and road traffic, more bird species (and other animals) have been audible in many cities (Asensio et al. 2020). Likewise, many people privileged with a backyard, balcony, or porch began to enjoy watching nature and creatures during lockdown, which emerging evidence suggests can serve as a buffer against anxiety (Pouso et al. 2021). These behaviors may be the result of staying at home and thus us simply appreciating our surroundings more. But, they could also relate to an inability to have human contact and thus us looking to non-human species to reduce our feelings of isolation. Growing evidence also suggests that such visual and auditory contact with the natural world may benefit human health (Frumkin et al. 2017; Buxton et al. 2021). Careful attention to the key ingredients of exposure (intensity, duration, and frequency), differences in who has access to wildlife and nature and the quality and safety of those spaces, differences in the associated benefits across social groups, and the potential harmful effects of negative exposures, may propel this area of inquiry forward.

A second re-imagined area of inquiry may be the longer-term impacts of changes to social capital on health, using a natural experimental design. The pandemic has created conditions that would be difficult or unethical to study in an artificial experimental research design. Instead, conceivably we can harness the natural experiment to better understand how social capital influences health; a clear need in social capital research (Moore and Carpiano 2020). For example, there is great variation, often sub-nationally, in children's participation in in-person classrooms and the social networks and relationships associated with school attendance. Other children are learning at home, often online, with limited ability to engage with peers and form or maintain social bonds. Likewise, offices and university campuses in some places have remained closed and work is being carried out online and at home. whilst others have remained open. Collecting data prior to and during/following COVID-19 restrictions, or across locations with different conditions, may allow us to explore the effect of differential policies or restrictions, previously unimaginable, on social capital and its influence on our health.

In addition to these more immediate, new research directions, others are signalled as we have very limited insights into the longer-term health consequences of altered social conditions. Have the bonds and bridges of common sympathy and social trust been permanently broken? Will society long to have large numbers of people materially together again or will this continue to be mistrusted or avoided? What part of group membership is irreplaceably physical occurring only in shared spaces? And what part is internal and can be built or maintained virtually? How much trust can be generated online without physical contact to build and define group membership? With the economy turned on end and conversations now occurring about shorter work weeks, universal income, re-valuing lower paid, frontline work, and permanently changing educational and work spaces, the longer-term impacts of these social changes will certainly be an important area of inquiry.

In summary, through its re-shaping of notions of trust, group membership, and social isolation, COVID-19 offers challenges and opportunities to research our changing social conditions. Seizing this opportunity will require a development of epidemiological and theoretical thinking about the links between social capital, global health and disease prevention. We must wrestle with how this pandemic and the cascading economic, environmental, and social conditions shape the quality of social relationships between citizens, determine levels of trust in one another and how social conditions, in turn, shape policy and economic approaches. These changes may have meaningful influence on health and well-being, beyond COVID-19's direct deleterious effects. At this unprecedented moment in time, it is vital that we reflect on the ways in which our social lives were previously structured and on new possibilities for ways of being afforded by the disruption of systems and of hegemonic structures which are only now possible and could make for a healthier, equitable future.

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Chapter 19
The Syndemic Pandemic: COVID-19 and Social Inequality

Clare Bambra and Katherine E. Smith

1 Introduction

The rate of COVID-19 infection is six- or seven-times higher in the most deprived areas of Catalonia compared to the least deprived (Catalan Agency for Health Quality and Assessment 2020). In the American cities of Chicago and New York City, there is evidence of a dramatically increased risk of death observed among residents of the most disadvantaged counties (Chen and Krieger 2020). And in England, the most deprived neighborhoods have a COVID-19 mortality rate more than twice that of the most affluent (Public Health England 2020). COVID-19 deaths are also almost twice as high amongst Black, Asian, and minority ethnic (BAME) populations in England (Public Health England 2020). In the USA, the Centers for Disease Control and Prevention (CDC) reported that 33% of hospitalized COVID-19 patients in March 2020 were Black (whereas Black communities make up only 18% of the population studied) (Garg et al. 2020).

What explains these stark geographical, socio-economic, and ethnic inequalities in the COVID-19 pandemic? After all, there have been claims that COVID-19 is an equal opportunity disease, with everyone in it together. This three-part chapter examines these inequalities in COVID-19 in more detail—contextualizing them within the wider literature on health inequalities. It starts by summarizing evidence of geographical, socio-economic, and ethnic inequalities in COVID-19. It then

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applies insights from the wider health inequalities literature to understand how long-standing inequalities in the social determinants of health have led to inequalities in COVID-19 infections and deaths—resulting in a syndemic pandemic. Third, it examines the unequal experience of the policy responses to COVID-19 including the lockdowns and the potential unequal impact that the COVID-19 economic crisis might have on future morbidity and mortality. It concludes by reflecting on the longer-term challenges that the pandemic presents, arguing that this is an important moment for renewing efforts to reduce health and social inequalities.

2   Social Inequalities in COVID-19

In the first stage of the pandemic (March to June 2020), clear evidence was already emerging from a variety of countries of geographical, socio-economic, and ethnic inequalities in COVID-19 infections, symptom severity, and deaths.

Data published by the Catalonian government in Spain suggested that the rate of COVID-19 infection is six- or seven-times higher in the most deprived areas of the region compared to the least deprived (Catalan Agency for Health Quality and Assessment). Similarly, in the US analysis, area-level socio-spatial gradients were found in terms of infection levels in New York City, with dramatically increased risk of death observed among residents of the most disadvantaged counties (Chen and Krieger 2020). In Canada, a higher percentage of cases was observed in the neighborhoods with the lowest average income levels compared to the highest. For example, in Toronto, the lowest income neighborhoods had higher rates of COVID-19 cases (113 cases per 100,000) and hospitalizations (20 hospitalizations per 100,000) compared to the highest income neighborhoods (73 cases per 100,000; 9 hospitalizations per 100,000) (CBC News 2020). In England, analysis of patients admitted to hospital with COVID-19 reported that 45% of patients were from the most deprived 20% of the population (Sapey et al. 2020)—COVID-19 admissions to critical care were also far greater in the most deprived areas, with over 50% of admissions coming from the 40% most deprived areas (Intensive Care National Audit and Research Centre 2020). Large-scale analysis of the impact of deprivation on COVID-19 mortality found that the risk of death was almost twice as high in the most compared to the least deprived quintile: 128.3 deaths per 100,000 versus 58.8 deaths per 100,000 (Office for National Statistics 2020).

Inequalities in COVID-19 by ethnicity are also evident. Official data from England has found that BAME populations have a much higher mortality risk than the White British population: compared to White British populations, Black British and British Bangladeshi populations have twice the mortality risk, with between 10% and 50% greater risk seen across the Indian, Pakistani, Other Asian, Chinese, Caribbean, and Other Black ethnic groups (Public Health England 2020). Similarly, in Canada, data shows that neighborhoods with the highest percent of people from Black, Asian, and minority ethnic (BAME) communities had higher COVID-19 case and hospitalization rates compared to quintiles with the lowest percent of each

(CBC News 2020). In Toronto, areas with the highest percentage of recent immigrants also had the highest rate of COVID-19 cases, with 104 per 100,000 people compared to 69 cases per 100,000 people in areas with low levels of recent immigrants (CBC News 2020). This was reflected in terms of inequalities in hospitalizations: areas with the highest percentage of recent immigrants had the highest rate (18 cases per 100,000 people compared to eight cases per 100,000 people in areas with lowest levels of immigration) (CBC News 2020). Even more stark is the data on ethnic inequalities in COVID-19 infections and deaths that is being released by various states and municipalities in the USA. For example, in Chicago (in period ending July 2, 2020), 75% of COVID-19 deaths were amongst Black and Latino residents and the COVID-19 mortality rate for Black Chicagoans is 145 per 100,000 people and 108 per 100,000 for Latino Chicagoans compared to 56 per 100,000 amongst White residents (Chicago Department of Public Health 2020).

The increased vulnerability to COVID-19 as a consequence of socio-economic and geographical axes of inequality also intersects with ethnicity, as ethnic minorities are much more likely to be socio-economically deprived and/or to live in more deprived neighborhoods, as well as to be disproportionally disadvantaged by compounding determinants (Gkiouleka et al. 2018). There are also intersections with age and gender—with, for example, higher rates of mortality amongst older age groups and men (Bambra et al. 2020a).

3   Explaining Inequalities in COVID-19: The Syndemic Pandemic

The pathways linking deprivation, lower socio-economic status, and ethnicity to higher COVID-19 infection rates, cases, and deaths are multiple. Bambra et al. have posited that COVID-19 is a syndemic pandemic, acting synergistically with—and exacerbating—existing socio-economic, geographical, and ethnic inequalities (2020). The concept of a syndemic was originally developed by Singer from analyzing the relationships between HIV/AIDS, substance use, and violence in the USA in the 1990s (Singer 2000). Singer asserted that a syndemic exists when risk factors or co-morbidities are intertwined, interactive, and cumulative—adversely exacerbating the disease burden and additively increasing its negative effects: "A syndemic is a set of closely intertwined and mutual enhancing health problems that significantly affect the overall health status of a population within the context of a perpetuating configuration of noxious social conditions" (2000, p. 13). For the most disadvantaged communities, as Bambra et al. 2020b have argued, COVID-19 is experienced as a syndemic pandemic (Fig. 19.1).

Inequality thereby increases adverse COVID-19 outcomes (infection rates, symptom severity, and deaths) through four pathways—increased vulnerability, susceptibility, exposure, and transmission (Bambra et al. 2020b).

Fig. 19.1 The syndemic of COVID-19, non-communicable diseases (NCDs), and the social determinants of health. (Reproduced from Bambra et al. (2020b) with permission from BMJ publishing)

- Increased vulnerability: Due to higher burden of Non-Communicable Diseases (NCDs) (such as diabetes and respiratory conditions, heart disease) that increase the severity and mortality of COVID-19. These co-morbidities arise as a result of inequalities in the social determinants of health (e.g., working conditions, unemployment, access to essential goods and services, housing, and access to health care).
- Increased susceptibility: Due to immune systems weakened by long-term exposures to adverse living and environmental conditions. The social determinants of health also work to make people from deprived communities more vulnerable to infection from COVID-19—even when they have no underlying health conditions as adverse psychosocial circumstances (chronic stress) increase susceptibility—influencing the onset, course, and outcome of infectious diseases—including respiratory diseases like COVID-19.
- Increased exposure: As a result of inequalities in working conditions. Lower paid workers—particularly in the service sector (e.g., food, cleaning, or delivery services)—were much more likely to be designated as key workers and thereby

were still required to go to work during lockdown, and more likely to be reliant on public transport for doing so. Likewise, now low-income occupations are less likely to be able to work from home.

- Increased transmission: Inequalities in housing conditions may also be contributing to inequalities in COVID-19. Deprived neighborhoods are more likely to contain houses of multiple occupation, smaller houses with a lack of outside space, as well as have higher population densities (particularly in deprived urban areas) and lower access to communal green space. These may have increased COVID-19 transmission rates—as was the case with previous influenza pandemic in 1918 and 2009 where strong associations were found with urbanity (Bambra et al. 2020b).

4 Social Inequality, Lockdowns, and the COVID-19 Economic Fallout

The impact of COVID-19 on health inequalities will not just be in terms of virus-related infection and mortality, but also in terms of the consequences of mass quarantine measures implemented in spring 2020: so-called lockdowns. These state-imposed emergency restrictions have been of varying levels of severity, but all have in common a significant increase in social isolation and confinement within the home and immediate neighborhood. The lockdowns and the longer-term social distancing measures in place have also led to an emerging economic crisis, which also has unequal impacts (Institute for Fiscal Studies 2020).

Lockdown measures have proved particularly challenging for mental health—with concerns expressed by medical professionals about the impact of extended isolation and lack of social contact. This is exacerbated by rising financial insecurity and poverty, issues disproportionately experienced by those with lower incomes or in more insecure employment. Charities have reported that gender-based violence and child abuse have also increased—disproportionally experienced by women, children, and by lower SES and minority ethnic groups (Bambra et al. 2020a). Further, as a result of health services having to focus on combating the pandemic, there has been a significant reduction in health care access for people with existing chronic conditions, such as cancer and cardiovascular disease. Similarly, access to preventative care has been restricted as a result of health system pressures and the need for social distancing. This will disproportionately impact on populations with higher rates of NCDs—i.e., low-income and minority ethnic groups (Bambra et al. 2020a, b).

Past research suggests that the longer-term economic fallout from the pandemic may also be experienced unequally (Bambra 2016), leading to increased morbidity and mortality amongst the most disadvantaged communities. The global economy has been severely impacted by COVID-19—with major reductions in GDP, oil price falls, and record levels of unemployment—economists fear that the economic

impact will as bad as, or worse than, the Great Depression of the 1930s. Emerging data is already charting the unequal economic fallout of COVID-19 in the UK, with the sectors of the economy most hard-hit including retail, tourism, and restaurants—all of which disproportionately employ low-income workers, women, BAME communities, and young people (Institute for Fiscal Studies 2020). The health consequences from this economic crisis are likely to impact differently across the social hierarchy. Previous economic recessions have led to increases in physical and psychological morbidity and mortality, disproportionately experienced by the most deprived communities (Bambra 2016).

Yet, the unequal spread of the economic fallout can be mitigated by policy, meaning much depends on how governments choose to respond to the unfolding economic crisis. States could use the renewed focus on health and economic inequalities to acknowledge the failings of traditional "trickle down" economics and to shift to more inclusive, redistributive economic policies. Indeed, Scotland, New Zealand, and Iceland are all focusing on developing what they call "wellbeing economies." On the other hand, states may use the inevitable recession as a rationale for further cutbacks in public spending, disproportionally impacting more marginalized communities and further exacerbating health and economic inequalities.

5   Conclusion: Unequal Futures?

COVID-19 struck within a context in which there were already extreme—and rising—health inequalities in most countries—with, for example, gaps in life expectancy of 9 years between neighborhoods in England and an extreme 25-year gap in life expectancy across the suburbs of New Orleans (Bambra 2016). Now the pandemic is also being experienced unequally with mortality rates more than double amongst more deprived and minority populations. The economic fallout will also be unequally felt unless governments choose radical measures to counter these inequalities. What the post-COVID future holds for health inequalities therefore all depends on how policy makers in different countries chose to react. Research into previous periods of economic crisis suggests that, even if governments fail to redress unequal economic impacts, they can mitigate the longer-term health impacts of pandemics by improving public health and health care services, increasing access to public services to support those with social or health needs, and maintaining and enhancing social security safety nets. The longer-term effects of COVID-19 may well therefore be experienced quite differently due to national policy variation. This will have important implications for how the pandemic impacts on health inequalities in the longer term.

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Chapter 20
Maintaining Wellbeing During and After COVID-19

David Conradson

1   Introduction

> The COVID-19 pandemic is, first and foremost, a global public health crisis, yet its impacts extend far beyond the realm of epidemiology alone. We are also witnessing a political, economic, and social crisis the likes of which the world has not seen since the 1918 influenza pandemic and the Great Depression. (Rose-Redwood et al. 2020, p. 97)

> *This is just the beginning*, as the doctors say. And yet already the artists have answered the rally-cry, pouring their beauty onto social media posts, across street buildings, and through apartment windows to connect us, soothe us, and inspire collective action. (Gupta 2020, p. 593, emphasis in original)

If we follow the World Health Organization's (WHO) (1948) formulation and understand wellbeing as not simply the absence of disease but rather as the presence of physical, mental, and social health, then COVID-19 has clearly had significant implications for population wellbeing. This chapter examines some of the ways in which the pandemic has compromised wellbeing, acknowledging its differential impact with respect to socioeconomic status, race/ethnicity, and age. It also considers a selection of the initiatives that governments, community and voluntary organizations, businesses and citizens have taken to bolster the wellbeing of people in particular places. The balance of activity between these different actors has varied significantly between places, with the governments of some countries taking decisive action to control the virus (e.g., in China, South Korea, New Zealand), while other nations have given higher priority to the maintenance of personal freedom and the preservation of economic activity (e.g., the United States, Brazil, Sweden). Although the relative efficacy of these response strategies is still being assessed, those countries which have moved quickly to suppress or eliminate the virus in its

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early stages seem to have fared better in both health and economic terms. As a foundation for the discussion that follows, much of which is informed by geographical perspectives, the next section looks at the concept of wellbeing and how geographers have approached it.

2 Wellbeing: Conceptualizations and Geographical Perspectives

The concept of wellbeing is a multi-dimensional formulation of human health, encompassing bodily functioning but also psychological, emotional, and social domains. Wellbeing thus extends beyond the physiological orientation typical of much of western biomedicine. We can investigate the wellbeing of an individual, recognizing that this will normally fluctuate each day and over the life course. It is also possible to consider the wellbeing of a social collective, such as a household, community, neighborhood, or city. Most scholars understand collective wellbeing to be shaped by social and interpersonal processes such as trust and reciprocity, so that collective wellbeing is always more than a simple aggregation of the wellbeing of particular groups of individuals.

When investigating wellbeing, researchers typically distinguish between objective measures (e.g., a person's blood pressure, income, or education level) and subjective self-report measures (e.g., current feeling state or assessment of life satisfaction). Objective measures may be obtained through primary research (e.g., income surveys) or via secondary data (e.g., census information on educational attainment for a given neighborhood). Subjective measures are typically acquired through survey research, using instruments that combine a mood/affect component (e.g., "how do you feel today?") and a retrospective, more cognitively oriented assessment (e.g., "how satisfied are you with your life over the past 2 weeks?"). Qualitative interviews are also sometimes employed.

Geographers have been interested in wellbeing for several decades now, with a number of identifiable strands of work (Conradson 2012; Schwanen and Atkinson 2015). From the 1970s, social geographers examined spatial patterns of social wellbeing (e.g., Smith 1973; Knox 1975; Pacione 2003), identifying on-the-ground inequality and seeking to identify and intervene in the processes which created it. Second, in medical geography, disease ecology has sought to establish the relationship between particular environmental conditions and the presence or absence of infectious disease, such as cholera or dysentery (e.g., Emch et al. 2017). A third and related field of work has sought to understand environments known or experienced as being health-giving or salutogenic, such as particular natural hot springs or alpine retreats. Much of this work has oriented around the notion of therapeutic landscapes (Gesler 1992; Bell et al. 2018; Gesler 2005), or related ideas such as supportive and enabling environments (Duff 2011). More recently, there have been sustained explorations of so-called "green" and "blue" spaces—environments in which plant life

and water feature predominantly—and of the health and wellbeing impacts for those who encounter them (Foley and Kistemann 2015; Foley et al. 2020). A fourth strand of work has involved the critical evaluation and augmentation of current conceptions of wellbeing. This work has included interrogations of the concept of subjective wellbeing (Atkinson 2020); the use of non-representational theory to advance geographical theorizations of health (Andrews 2018); and examinations of the divergence between western constructs of wellbeing and the more place-based, ecologically attuned understandings of many indigenous people (Biddle and Swee 2012; Prout 2012). Although these four strands of work differ in important methodological and analytical respects, they share a concern with how places, environments, and human lives intersect to generate varying degree of wellbeing.

Drawing on this rich background, including work in disease ecology (e.g., Haggett 1994; Keeler and Emch 2018), a number of geographers have been investigating the COVID-19 pandemic (e.g., Mayer and Lewis, 2020; Sparke and Anguelov 2020; Rose-Redwood et al. 2020). The emerging scholarship is diverse and multifaceted. One distinctive feature is the use of actor network and assemblage theories to consider the social, cultural, biological, and technological dimensions of the pandemic in an integrated manner. Such theories are useful because they support "a social and spatial imagination that can generate a multisited and transspecies account of disease events" (Hinchliffe et al. 2016, p. 83). Geographers are also drawing on earlier considerations of the topological networks that connect diverse bodies and places in a globalizing world (e.g., Ali and Keil 2007; Dixon and Jones 2015). Some are employing the insights of political ecology to examine the dynamics of the current socioeconomic-ecological moment, following earlier work in this vein (King 2010; Mayer 1996). Fernando (2020) has proposed the term "virocene," for example, to describe the ways in which planetary life is being profoundly (re) shaped by COVID-19.

Before seeking to summarize some of the wellbeing impacts of COVID-19—and mindful of Haraway's (1988) injunction that there is no omniscient view but only situated knowledges—it seems important to acknowledge that I write from a particular place: Aotearoa New Zealand. As a small island nation of five million in the south Pacific, New Zealand has been relatively successful to date in limiting the spread of COVID-19, with less than 30 deaths by the end of 2020. This outcome has been achieved through the implementation of an extended period of strict nationwide lockdown, however, which contributed to a significant economic downturn. The closure of the national borders has also dramatically reduced the usual inflows of tourists, migrant workers, and international students. So, this account is written from a place in which the death toll has thus far been low but where the economic, social, and psychological impacts of COVID-19 have nevertheless been significant. It is also worth noting that account offered here is rooted in Anglophone literature and western media, and so its coverage of peoples and places where English is not the first language spoken is limited. In short, the chapter offers a partial account of the pandemic at a particular point in time, recognising that it continues to shape our world in quite profound ways.

3 Disruptions to Wellbeing

Alongside the millions of infections and deaths, COVID-19 has significantly disrupted population wellbeing across the world. In the economic domain, the implementation of mobility restrictions and lockdowns in countries as diverse as China, France, Spain, South Korea, Denmark, the United States (US), and New Zealand has unsurprisingly led to significant contractions in production and consumption. Restaurants, bars, and cafes have typically been heavily affected, whereas food and online retail has generally remained resilient (and some online retailers, such as Amazon, are reported to have realized unprecedented profits). With many national borders closed, international tourism has contracted heavily, with significant redundancies in many airlines and the travel industry. The associated increases in unemployment have caused some people difficulties in meeting their basic housing, utility, and food costs. Unsurprisingly, a number of emergency relief organizations (e.g., food banks and housing shelters) have experienced significant increases in demand.

In the social domain, the disruption of everyday patterns of interpersonal contact and interaction has generated a range of challenges. For people living by themselves, periods of lockdown have often intensified the solitary nature of their existence, as normal daily interactions beyond the home have been curtailed. For those living with others, there have been some reports of increased incidence of domestic violence and abuse, where relational tensions have perhaps been exacerbated. For older people in residential care settings—where the transmission of the coronavirus has been particularly deadly—the prohibition on external visitors has for many been a significant privation and disappointment. In many countries, and particularly in those with large numbers of fatalities (e.g., the US, United Kingdom (UK), Italy, Belgium, Iran), there has also been palpable grief and loss (Maddrell 2020).

The wellbeing impacts of COVID-19 have been socially differentiated, in ways that reflect already existing hierarchies. In general, ethnic and racial minorities and people of lower socioeconomic status—who are more likely to live in crowded housing and to be employed in jobs where physical distancing is harder to achieve—have experienced greater rates of infection and higher fatalities (Bambra et al. 2020). These individuals are also more likely to have experienced economic hardship (e.g., redundancy, unemployment, wage reductions, eviction, and mortgage foreclosure), as their household financial resources were typically already quite constrained. So, while the aphorism that "we are all in this together" may be true at a very general level, there have been very significant differences in the experience of the pandemic, in ways that have both reproduced and deepened existing patterns of socio-spatial inequality.

Alongside these economic and social impacts, some people have experienced anxiety regarding their personal vulnerability to the infection, as well as feelings of confinement and deprivation associated with the loss of normal freedoms of movement and everyday opportunities for interpersonal interaction (Herat, 2020). It has probably not helped that the coverage of COVID-19 on social and mainstream

media has involved a steady stream of planetary-scale bad news regarding the virus. This has certainly had the potential to exacerbate worry and distress. On this note, some commentators have referred to the habit of restlessly scanning through dystopian reports of COVID-19 as "doomscrolling" (Watercutter 2020). So while the mediatization of COVID-19 has arguably raised people's awareness and understanding of the pandemic, it is also implicated in the international circulation of anxiety, fear, and gloom regarding the disease (Depoux et al. 2020).

4 Diverse Initiatives to Maintain Wellbeing

In response to the intense disruption of COVID-19, governments, businesses, voluntary and not-for-profit sector organizations, and citizens have taken a range of actions to maintain the wellbeing of people in particular places.[1] The nature of these contributions has reflected differing political and cultural systems, and their impact has of course varied. Although systematic assessments of these interventions are not yet widely available, it is nevertheless possible to identify several common features.

With regard to the economy, many governments have sought to maintain citizens' wellbeing through initiatives to bolster the labor market. In the US, UK, Australia, and New Zealand, for example, there have been wage subsidies and various forms of business assistance. Such assistance responds to the severity of economic need the pandemic has generated. Other governments have recognized the profound psychological challenges that restricted mobility and economic uncertainty have created for some people, and directed additional investment to relevant mental health services. Local community and voluntary organizations have often been involved in providing mental wellbeing services, sometimes working in partnership with governments.

In the social and psychological domain, most elected leaders have sought to acknowledge the hardship their citizens are experiencing, while at the same time framing this hardship as a necessary sacrifice to ensure the ongoing health of the country. Some politicians, such as Chancellor Merkel in Germany and Prime Minister Ardern in New Zealand, are regarded to have offered socially convincing narratives in these regards. In contrast, leaders such as President Trump in the United States, President Bolsonaro in Brazil, and Prime Minister Johnson in the

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[1] Governments tend to announce and enact their initiatives in quite visible ways, and this news is often then picked up and circulated by the media. In contrast, smaller scale responses from citizens and the community and voluntary sector, are less likely to attract international or even national media attention. This uneven visibility of governmental and non-governmental initiatives is such that initiatives in the former category are easier to obtain information about. This information asymmetry is reflected in the balance of content in this chapter. There are also good opportunities for further research to elaborate and deepen our understanding of responses to foster wellbeing during the pandemic.

UK have received some support but also attracted significant public criticism. Whatever the situation, many governments have faced challenges regarding how best to secure popular compliance with public health directives (e.g., regarding mobility restrictions or wearing face coverings), especially when taking into account cultural expectations regarding personal freedom. At stake is the extent to which citizens will voluntarily forgo their individual liberty for the sake of the collective good, as well as the point at which a governmental decree on such matters moves from being regarded as reasonable to being considered coercive and unreasonable.

Alongside governmental initiatives, not-for-profit, community and voluntary sector[2] organizations have worked intensively to support people's wellbeing during the pandemic. Within various national and regional contexts, for example, these organizations have provided material assistance and relational support in response to housing, food, and clothing needs. Some have advocated for the needs of particular groups, including black and minority ethnic (BAME) communities, indigenous peoples, the elderly, LGBTQI+ people, and those whose employment conditions place them at higher risk of contracting the virus. Such advocacy has sometimes sought to exert pressure on state and federal governments to be more proactive, so as to support the wellbeing of these individuals. As is generally the case, many of the third sector and voluntary organizations offering this support depend upon government contracts, grants, and (in some cases) private donations for their operations. The fluctuating availability of such funding and varying levels of locally motivated staff and volunteers often leads to a geographically uneven landscape of service provision; such unevenness has certainly been a feature of the voluntary and not-for-profit service provision that has arisen in response to COVID-19.

At the community level, mutual aid appears to have flourished during the pandemic (Diavolo 2020). An online directory of such initiatives in the US, for example, reveals activities ranging from listening services and shopping assistance through to invitations to join activist and protest groups of various kinds.[3]

Humor and playfulness have helped some people navigate the privations of lockdown and other forms of restricted mobility, particularly given the broader context of a profoundly altered health and employment landscape. In the city of Christchurch in New Zealand, for example, local children created humorous chalk art on the sidewalk in many neighborhoods, and their work was often updated every few days. Online, Instagram, Twitter, and TikTok have been awash for much of 2020 with COVID-19 memes, jokes, and even dance routines. The material on these forums extends from everyday silliness through to political satire and strong critique (e.g., the work of Sarah Cooper lip-syncing the announcements of US President Donald Trump).[4] Some of these memes have had a somewhat punitive or judgemental edge,

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[2] These terms are broadly synonymous, with preferential use in particular countries.

[3] See https://mutualaiddisasterrelief.org/collective-care/.

[4] For a short report on Sarah Cooper's work, with examples, see https://youtu.be/Nvxj5gWah_E (accessed August 2020).

such as the trope of "Karen" to personify an entitled white middle-aged woman whose commitment to personal liberty leads her to resist wearing a mask or face covering in a particular store or public space. Others have been more empathetic, hopeful, or playful in tone. So while social media has sometimes functioned as a conduit for anxiety regarding COVID-19 (Depoux et al. 2020), it has also enabled people to gather together, dissipate stress, and to generate new forms of political commentary and engagement.[5] During periods of lockdown, a number of people also migrated their previously in-person social interactions into the virtual domain, enjoying coffee meetings and social drinks with friends and family on platforms such as Zoom, Microsoft Teams, and Google Hangouts.

For those able to access them, the arts have sometimes been an additional source of solace and relief. The capacity of art and creative practice to hold and sometimes even transmute feelings such as hostility, anger, and despair has been an important counterpoint to the bleakness of restricted movement and limited in person contact (Gupta 2020). The "songs of comfort" created by the internationally renowned cellist Yo-Yo Ma are just one example of such work.[6] The broader point is that wellbeing is maintained not only through formal policy interventions in a social or economic system, but also by acts of everyday resistance, aesthetic creativity and kindness. If we are to navigate the challenges of COVID-19, Uden and Houtum (2020) contend that we need to move beyond nationally configured forms of identity and to cultivate more inclusive forms of love and respect for each other. Expressions of gratitude have been significant in this regard. During the first period of lockdown in the UK, for example, local people in many towns and cities gathered each evening outside their homes to express their appreciation to frontline healthcare workers through public clapping. Although this particular form of public expression has subsided, it worked to foster a sense of collective solidarity at the time. It may also have fostered some resilience to the severe disruption to normal arrangements for work, school, and social life.

5 Concluding Reflections

The broader wellbeing implications of COVID-19—which flow variously from the fear of becoming seriously unwell or dying, and from the economic, social and psychological impacts of lockdowns and mobility restrictions—are likely to persist for some time. The still-to-be-understood impact of so called 'long Covid', in terms of enduring physical and mental health problems among those who become

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[5] To generate a systematic inventory of more and less supportive forms of online sociality during the pandemic would be a challenging research task. But at least some online sociality during the pandemic has been experienced as supportive and uplifting, rather than undermining or compromising of wellbeing.

[6] See https://www.nytimes.com/2020/06/09/arts/music/yo-yo-ma-favorite-things.html (accessed August 2020).

critically ill but survive the disease, seem likely to be significant. Some people will experience difficulty finding work in a reconfigured economy, and a significant proportion may experience psychological problems such as anxiety and depression as they attempt to negotiate financial stress and uncertainty about the future. There may also be a level of population-wide trauma and PTSD as a result of the severity of the pandemic, particularly among frontline health workers and in communities with high numbers of deaths.

Looking ahead, there are several potential avenues for further geographical research into wellbeing and COVID-19. One area that warrants investigation is the impact of the pandemic on existing socio-spatial inequalities, including those that reflect race/ethnicity, gender, and employment differentials. In what ways has the pandemic deepened or disrupted existing patterns of inequality? How have the geographies of infection and deaths intersected with existing structures of affluence and deprivation? In the United States, it would seem that African American, Native and other minority communities have been disproportionately negatively affected. How have minority ethnic groups and indigenous peoples in other countries fared, and why?

A second potential line of enquiry concerns the mental health and political impacts of lockdown and mobility restrictions. The pandemic has profoundly disrupted normal rhythms of movement and interaction, and some places have had to endure multiple periods of lockdown. Many people have found these recurring restrictions very challenging, not least because of their potential to exacerbate social isolation. Geographers could usefully collaborate with public health, epidemiological, and other researchers to document the psychosocial and mental health impacts of lockdowns and mobility restrictions. Such work might then contribute to the development of reparative and therapeutic engagements with people most affected by these privations.

A third area for investigation is the role of both mainstream and social media in shaping popular understandings of and responses to the pandemic. The algorithms driving newsfeeds on social media platforms such as Facebook have been identified as fostering ideological echo chambers, for example, contributing to social division and working against solidarity. The seemingly untethered claims of some political leaders have then supported the rise of anti-expert and anti-science positions. The resulting diminution of trust in scientific expertise has had serious ramifications for public adherence to public health advice. So although the media continues to offer an important set of windows onto the evolution of the pandemic, it has also contributed to the circulation of anxiety and to processes of social fragmentation. In short, there is much to investigate in terms of how various forms of media have influenced the nature, experience, and progression of the COVID-19 pandemic.

If we are to foster wellbeing in the coming decade, citizens, government, businesses, and voluntary and community organizations will need to find new ways to collaborate for the common good. Although the virus has been deeply challenging for many communities, our collective responses at times have demonstrated that a different world is possible. This is a world in which travel-related emissions fall, people's engagements with local places deepen, and new forms of belonging and

social interaction emerge. It is a world that looks closely at the social and environmental harm caused by neoliberal capitalism. It is a world in which we make a sustained effort to build alternative economic and political institutions. Realizing such a world will require us to move beyond our pre-COVID values and ways of being, rather than seeking to chart a course back to "normality." If we were to take such a path, then the deep loss and disruption wrought by COVID-19 might become an important step in fostering more sustainable, just and equitable forms of life on Earth.

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Chapter 21
Pandemic Geographies of Physical Activity

Stephanie E. Coen, Simon Cook, and Samuel J. Hayes

1 Introduction

Geographies of physical activity are broadly interested in where and how physical activity happens, environmental barriers to and facilitators of physical activity, representations and experiences of physical activity, and the social, cultural, and political implications of these. Critical geographical perspectives, rather than seeing physical activity as a 'lifestyle behaviour', understand physical activity to be shaped by and situated in socio-material structures and contexts that support or constrain participation. Such approaches foreground concern with disparities in participation along gendered, racialized, and other intersecting lines across places and populations (Coen et al. 2020)—but in a global pandemic, when some of our most basic health and social needs are jeopardized, should we even care about physical activity?

In this chapter, we interrogate pandemic geographies of physical activity, focusing on the socio-spatial inequities which surround access and participation. First, taking a critical health geography perspective, we illustrate how exercise is being 'weaponized' against COVID-19 as a tool for the neoliberalization of health that downloads responsibility for COVID-19 prevention and management to a moral problem for individuals. Next, we consider early evidence about the effects of the

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pandemic on physical activity, which paints a mixed picture while largely indicating a continuation of inequitable trends. Finally, we demonstrate how a pandemic geography along an indoor (private)/outdoor (public) binary not only intensifies existing inequities in physical activity but crystallizes how participation is interconnected with wider social injustices. We argue that the question 'who cares' about physical activity in pandemic times, is better thought of as 'who *can* care'.

2   When Exercise Is Not Medicine

As the pandemic unfolds, physical activity is being co-opted as a neoliberal intervention to mitigate the health effects of COVID-19. Given some evidence that suggests body weight correlates with COVID outcomes, along with a concern that sustained inactivity during quarantine could increase susceptibility (Woods et al. 2020), many governments are advocating exercise as a personal risk management strategy (Ding et al. 2020). As illustrated in Fig. 21.1, such approaches make exercise a moral obligation to confront COVID, and individualize COVID responsibility with messages that we can make our bodies 'fitter' to 'fight' COVID, without recourse to or recognition of the social inequities that prevent access to physical activity opportunities (Williams and Gibson 2018). By propagating false 'lifestyle choices' that set up individuals and communities to be blamed for 'moral failings' in COVID prevention and management, such interventions risk worsening outcomes for communities already disproportionately affected by COVID-19 because they ignore the social structures at play (e.g. systemic racism). Relatedly, such approaches pathologize body size, highlighted in Public Health England's campaign (Fig. 21.1) that depicts a woman's body as inherently 'risky' and categorizes her as 'obese' on a Body Mass Index (BMI) metre. Yet, a growing body of research has called into question the validity of BMI (Guthman 2012) and illuminated the racist origins of the measure (Evans and Colls 2009), underscoring how using body weight as a mechanism for COVID risk management risks exacerbating inequities. Perhaps most flawed of all, such messaging erroneously positions COVID-19 as a 'lifestyle disease' when it is a virus.

At the same time, evidence shows that physical activity can help support some people in coping with the mental and physical challenges of lockdown (e.g. older people, see Jiménez-Pavón et al. 2020). We contend, therefore, that especially in the time of COVID efforts should focus on community-level interventions that support physical activity participation while simultaneously addressing other community needs, like social care, childcare, food access, and employment support. This could include, for example, creating local infrastructure with opportunities for free physical activities (such as cycle paths, trails, outdoor gyms) and offering programming to support families juggling complex challenges such as childcare and job loss (e.g. offering family-inclusive group physical activities and free food).

Fig. 21.1 Tweet from Public Health England that links weight loss to COVID-19 personal risk reduction. (Source: https://twitter.com/PHE_uk/status/1293570008094834698)

3 Inequities: Old and New

How these changing contexts and discourses around physical activity have affected actual physical activity levels is not at all clear. Early research suggests a mixed picture, perhaps reflecting differences in countries whose COVID-19 measures permitted physical activity and those with greater collective capacity to 'care' about physical activity during a pandemic than others. While interest in physical activity in Australia, the United Kingdom (UK), and the United States (US) increased to unprecedented levels following lockdowns (Ding et al. 2020), this rarely translated into population-level increases. In Germany, significant decreases in physical activity were reported with almost 60% of the population only managing to maintain their pre-lockdown activity levels or becoming inactive due to COVID-19 (Mutz and Gerke 2020). Such aggregate data, however, mask vast diversity in who has

been able to convert increasing interest into actual increases in physical activity. This diversity is generally split along social divisions and, somewhat contradictorily, data seem to demonstrate both an entrenching of pre-existing inequities and almost an inverting of them, or at least the formation of new ones. In both Germany and the UK, some consistent patterns regarding those who find it easier to be physically active were reported. In Germany, younger people were most likely be able to maintain and intensify their physical activity during the early stages of COVID-19 (Mutz and Gerke 2020), while Sport England (2020: n.p.) data suggest that 'women, people from lower socio-economic groups, older adults, people with a long term condition, illness or disability, and people from some [Black, Asian and Minority Ethnic] communities—are still finding it harder to be active'.

Still, some evidence also suggests that the changing spatio-temporalities of lockdown life have altered previously inhibiting structures for some. Alternative data for the UK suggest a seeming inversion of prior physical activity patterns, with women and older people finding it easier to be active (Smith et al. 2020), similar to Germany, where women reportedly found new opportunities to increase physical activity (Mutz and Gerke 2020). Important here could be the lightening of spatio-temporal demands engendered by lockdown, enabling a large barrier to physical activity to be overcome (Welch et al. 2009). Scepticism about these findings is warranted, as they likely represent short-term changes in countries that permitted and encouraged physical activity within their lockdown measures (e.g. exercise was one of the only permissible reasons to leave home), rather than longer-term changes to physical activity inequities. Indeed, evidence suggests physical activity levels are starting to reduce as the pandemic continues (Garmin 2020; Sport England 2020), bringing into question the longer-term impact of COVID-19 on physical activity.

4   Binary Spaces and Intensifying Inequities

The pandemic has invariably shifted and limited the geographies of where we exercise. COVID-19 restrictions have commonly involved limitations on outdoor activities—from preclusion of all but essential outdoor activity (e.g. Spain) to limits on the time or distance for permitted exercise (e.g. France) as well as excluding the use of shared outdoor gym equipment (e.g. UK). This is coupled with popular reports of rising home exercise uptake amongst some groups during the pandemic. This emergent binary geography of physical activity, along an outdoor (public)/indoor (private) divide, has revealed and, in some cases, intensified existing inequities.

Being limited to close-to-home physical activity opportunities has heightened the importance of local outdoor spaces. From private gardens to good quality public green spaces, access is inequitable across the UK by socio-economic status and ethnicity (ONS 2020; CABE 2010). Likewise, in the US, Black and brown communities not only have less access to outdoor spaces but are seen by some as not belonging in such spaces (Smith 2020). Ray (2017), for example, reported pre-pandemic that Black men are less likely to engage in physical activity in

neighbourhoods perceived to be predominantly white and are more likely to participate in physical activity in neighbourhoods perceived as predominantly Black. The converse is reported for Black women, white women, and white men. Such geographical patterns relate to wider racial inequalities, including the over-policing of Black men and the effect of the 'white gaze' in public spaces (Owusu-Bempah 2017)—the potentially fatal consequences of which are exemplified by cases such as the murder of Black jogger Ahmaud Arbery by white neighbourhood residents in the US (Fausset 2020). The ways that the pandemic has materially shrunk geographies of physical activity can literally put lives at stake. These examples highlight how inequities in physical activity are invariably embedded in—and are also outcomes of—wider structural injustices that place some people at risk.

While a seeming pandemic-induced home fitness revolution has been heralded by some commentators (Nyenhuis et al. 2020) and evidence suggests an increase in home-based physical activity (see Garmin 2020), lockdown measures in response to COVID-19 have also confined people to their homes and domestic spaces in ways that have rendered recreational physical activity indoors impossible for many. As Fullagar and Pavlidis (2020, p. 5) note, 'Home as a safe place to retreat from contagion is an assumed ideal in many government responses, being for some a privileged location and others a reminder of dispossession, nonbelonging and loss'. EU member states reported a 60% rise in emergency calls about domestic violence (Mahase 2020), which brings us back to our central question of who *can* care about physical activity in a pandemic? The home is a historic site of gender inequality, and the new geography of home as a site for everything intensifies and lays bare the intersections of privilege (e.g. time, money, space, gendered household roles) in terms of who *can* be active (Fullagar and Pavlidis 2020). There is also a danger that the content of home workout materials can fuel damaging tropes about idealized feminine and masculine bodies (Andreasson and Johansson 2013) and promote stigma (e.g. 'fear of fatness') during the pandemic—both of which may be exacerbated by public health messages framing body weight as an individual COVID risk management measure (Fig. 21.1).

At the same time, the rapid proliferation of free online workouts has inclusive potential. While not a panacea, online access to home workouts has potential to support physical activity within disability communities (Fitzgerald et al. 2020) in terms of accessibility (e.g. close captioning) and the ability to pause and resume as needed (e.g. to self-pace). We need to activate these possibilities.

5   A Post-pandemic Geography of Physical Activity?

The promotion of physical activity as a moral and public duty while shrinking its permissible geographies during COVID-19 has largely reinforced and even worsened existing inequities. Gendered, racialized, aged, and classed divisions have been highlighted in this chapter, yet our discussions have centred mostly on the minority world, reflecting from where research into pandemic physical activity has

emerged. The absences within this should be heard loudly. Caring about physical activity during a pandemic is a privilege unequally distributed within and between societies—perhaps most starkly when we consider the majority world where lockdowns have decimated informal sector livelihoods with little to no social safety net. For societies able to care, the pandemic has further underscored the complex and intersectional inequities of physical activity participation, exemplified, for instance, in how systemic racism puts exercising bodies at risk. In the longer term, considering physical activity participation as a health behaviour in isolation not only risks failing to increase participation, as structural barriers will still be in play, but also risks that physical activity interventions become a mask for inaction on underlying inequities.

There are positive glimpses of how physical activity can be made more accessible and inclusive within the context of COVID-19. For some, the spatio-temporal restructuring of everyday life and the increasing availability of online and home-based physical activity options are enabling participation in ways not possible previously. These warrant further attention and future work should continue to consider how such developments can be carried forward to chart new post-pandemic geographies of physical activity.

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Chapter 22
Surveillance, Control and Containment (Biopolitics)

Stephen Hinchliffe

Disasters, like tempests, plagues and famines, are at once ruinous and revelatory—they bring matters to the fore. COVID-19 has disclosed so much—the dangers of anthropogenic planetary changes; the externalities of capital-led shifts in livestock and the earth's biomass; the susceptibilities of dense and intensely connected human populations; the ways in which the disease exploited structural inequalities along lines of race, income and age; the vital importance and systemic neglect of frontline workers; and the roles of administrative and competent authorities in enacting security. How these matters are made visible or how they are brought to our senses, and how this information is used, become critical questions.

Responses to the European plagues of the early modern period underline this elevation and structuring of vision and its role in emerging forms of state security. Foucault (1977) used an account published at the end of the seventeenth century to characterise the activity that would prevail with the onset of plague. Lockdowns would freeze space, forbid people leaving home or going about daily business and allow regulation to penetrate the smallest details of everyday life and would seed a system of permanent registration, transmission of reports and centralisation. This was, for Foucault, an emerging political dream of order enacted through meticulous spatial partitioning. 'The plague stricken town [was] traversed throughout with hierarchy, surveillance, observation, writing' (Foucault 1977, p. 198). The political dream of the plague, as Foucault called it, was the inverse of the literary dream of the festival: 'not the collective festival, but strict divisions; not laws transgressed, but the penetration of regulation into every day life […]; not masks that were put on and taken off, but the assignment to each individual of his "true" name, his "true" place, his "true" body, his "true" disease' (Foucault 1977, p. 198). Plagues were a

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moment for classification, fixing identities and locations and the consolidation of institutions for and processes of measurement and calculation. This was in many senses the birth of what Foucault would call biopolitics—or the administering of life. Briefly, biopolitics tends to refer to the broadening and deepening of the techniques and apparatus of government, an 'intrication' of life sciences and politics, that ranged from the disciplining of individual bodies to the regulation of populations through manipulation of living processes, as a means to 'optimise a state of life' (Foucault 2004, p. 246). Disease events, and the growing towns and states in which they became increasingly manifest, were also, it should be added, the bases for a form of security oriented to a universal propensity for suffering (Gros 2019).

This nascent structuring of vision has its utopic and nightmare variants. On the one hand, vision is foundational to disease containment and control. Viral signatures from disease and zoonotic spill over hotspots, reliable case and mortality numbers, rapid and accurate diagnostics, tracing of contacts and isolation of those who might be infected—all have become key characteristics of competent state and intra-state authority backed by cutting-edge science. High-throughput genomics, rapid testing facilities, open data and mobile tracking of populations provide possibilities for real-time monitoring; for timely testing, tracking and isolating; and for generating the kinds of aggregation of numbers that enable speedy epidemiological analysis. The expansion of data sources coupled to algorithm and machine learning capabilities has enabled a big data version of disease surveillance to improve pattern recognition, pre-diagnostics and early warnings and so promise rapid interventions and preparation for epidemiological events. The instrumentation of all this data, and the re-framing of human experience as 'behaviour', has facilitated a growth industry in predictive and interventionist approaches to altering society in the name of better public health and greater biosecurity.

On the other hand, and for many in the humanities and social sciences, the word surveillance can ring alarm bells. As the prepositional tone of surveillance, or 'oversight', might suggest, there may be something a little sinister about all this visibility. For Foucault, surveillance tends to imply the stabilisation of vision, an economy of visibility and examination and the power of repetition. As he tells it, this is an exercise in power, dividing the world (division) into the seers and the seen, and in the process making 'dividuals' or entities, bringing them into a field of documentation and rendering them gradable, comparable and subject to becoming as potential cases (Foucault 1977). The disciplinary effects can reduce citizens to self-regulating docile bodies, while 'the entry of phenomena peculiar to the life of the human species into the order of knowledge and power, into the sphere of political techniques' (Foucault 1990, pp. 141–142), or the emergence of the biopolitical, can result in a regulatory approach to government which trades on an ill-defined (and thereby liable to manipulation) distinction between proper and improper life. All of this oversight, it should be noted, is performed by an increasingly abstract, unseen and unaccountable centre of expertise, with the dangers of social control most manifest when parties or movements are able to mobilise state surveillance apparatus in the service of total vision (Arendt 1973; Gros 2019). In this case, oversight becomes so totalising that freedom and agency are undermined not only by fear but also by the

aggregation of increasingly knowable actions that are subject to manipulation and modification. The most recent rehearsals of this dystopic vision focus not so much on the *coup d'etat* by a party or movement, but a *coup de gens* (Zuboff 2019, p. 495) or the seizure of power from the people by surveillant capitalists—the technical, data and media corporations. It is the centralisation and abstraction of unaccountable data accumulation and behavioural manipulation that fuels a compulsion towards totality.

During the COVID-19 pandemic, these dreams and nightmares of surveillance have both received an airing. Favourable reports of successful COVID-19 suppression within those states that rigorously applied surveillant technology tendto be shadowed by warnings that companies as well as state authorities involved in data generation and health data analytics are mobilising thermal imaging, facial recognition, 'volunteered' social media data, spatial and health data as a means not only to contain and control COVID-19 but also to drive future public order and commercial opportunities. As Kitchin (2020) has warned, it is the control creep, or the tendency of good, public health-related, intentions to morph into new market and authoritarian opportunities, or even less intentionally, for personal data to leak across networks or even between mobile phone applications, that should warn us of the dangers of assuming that we can temporarily suspend civil liberties in the name of public health. As is often the case, surveillance and disease control seem to be continuously poised, Janus-like, between beginnings and endings, between a new opportunity for seeing and a sense of the end to privacies, freedoms and universal provision based on need rather than commercial opportunity.

Since the onset of the COVID-19 pandemic, one of the vital lessons that needs to be quickly learned regards the affordances and limitations of surveillance and its role in disease containment and control as well as its post-pandemic after-lives. I will put forward two points here, both of which are underpinned by the sense that biopolitics need not signal a continuous declension to the management and *control of* society. In its stead, a *society of control* (Deleuze 1992) implies an opportunity, however difficult or hard fought it will be, to open up questions concerning what it means to make healthy lives while 'liberating and enslaving forces confront one another' (Deleuze 1992: 4). A society of control is neither total nor disciplinary, but networked and indefinitely active (Gros 2019: 143). It may be no less ominous in its extent and exhaustive reach as a disciplinary society, but it does at least provide the potential for re-networking and doing health otherwise. The two points are first, vision is always partial and is itself subject to counter-visions and other sensings; and second, envisioning COVID-19 has started to shift the objects of sense, care and control.

First, the partiality of vision: during the early stages of the outbreak in the city of Wuhan, Hubei district, China, there were initial concerns that Chinese officials and scientists were not making information available, particularly concerning evidence regarding person-to-person transmission of the virus. This is not in itself an unusual occurrence, where initially small numbers of cases, large uncertainties and the danger of raising false alarms are real considerations. Nevertheless, early warning regarding human-human transmission would be crucial in shifting control measures

from a sporadic zoonotic or animal to human disease to a potential epidemic. The Wuhan municipality claimed that it had in fact raised transmission concerns and passed these to Beijing. It was the experts in the capital who had issued statements that there was no evidence of human-to-human transmission, with the forced retraction of statements by concerned clinicians a result of this top-down edict. In Beijing, the clinical infection experts argued that Wuhan hadn't provided reliable data. As the buck was passed, or 'woks flew back and forth' (Xiuying 2020), the central party took control, purged local government officials and introduced a new party secretary or 'fixer' in Hubei province. In the United Kingdom (UK), several months later, and despite having ample evidence of the transmissibility of the virus and the severity of the disease, the government delayed lockdown and failed to shield vulnerable, elderly populations in care homes, with disastrous consequences.

Oversight is clearly not straightforward. Vision is partial in the sense that the objects of the surveillant gaze are seldom straightforward (this was a new virus, visible symptoms were often absent, while critical cases tended to develop secondary infections and symptoms related to a host of other conditions). Vision is also embedded within and conditioned by cultures, organisations, hierarchies and structures. In this case, the centralised, hierarchical and deferential nature of the Chinese Communist Party structure instilled a reluctance to raise an alarm, admit failings or report difficulties. This reticence is not of course limited to China (it is sometimes called the 'Chernobyl effect'). In the UK, a distracted administration—gripped by mathematical models of influenza-type epidemics, the assumption of long-lasting immune responses, a misguided focus on individual behaviours rather than collective social action and a widespread denial of the severity of the impending disease—embarked on a short-lived though fatal experiment in living with the virus (Hinchliffe 2020). In this case, oversight (surveillance) was arguably arrogated by a series of oversights (failures to notice).

Contra students of Foucault, who tend to talk of surveillance in terms of a form of seeing that is itself unseen, the 'overseers' were themselves subject, however imperfectly, to being seen. In China, despite early attempts to control information flows, neighbouring countries were quick to introduce screening of travellers; World Health Organization officials were monitoring the disease and containment measures; and a global community of virologists and clinicians were sharing data and observations. In the UK, scientific committees and government ministers were under continuous pressure to increase transparency while conscious of being held to account at a future, inevitable public enquiry into the systemic failures to prepare for or respond to the pandemic. Moreover, as cases rose and the UK Office for National Statistics revealed the extent of the pandemic within care homes, and state public health bodies reported on the racial profile of mortality figures, it was clear that attempts to establish hierarchies of seeing involved not so much an elimination of other social and material practices but their displacement (Munro 1997) and in some sense, a proliferation or ecology of sensibilities.

Following this, and second, COVID-19 offers the possibility for a shift in the objects of sensing. The inevitable difficulties in generating visibility of emerging and yet to emerge pathogens (for human coronaviruses alone, there are thought to

be thousands of candidates, and the problem of epistasis and microbial interactions means viral forecasting and gain-of-function experiments are always beset by large uncertainties), coupled to the inevitable oversights in oversight, suggest two broad courses of action. The first is to generate yet more data and refine systems of government to provide better vision and control. This will undoubtedly reveal the dangers of environmental damage, habitat destruction and trade in and mass exploitation of animal lives (Huong et al. 2020). But it will be unlikely to identify with pinpoint accuracy the next pandemic source. More vision, more data points and greater knowledge are not necessarily the same as clear or simple problem identification, even if they can reveal broad patterns and suggest necessary changes. Similarly, digital forms of human surveillance, frightening though they may be, remain beset by sociotechnical issues. Indeed, Kitchin (2020) questions whether the relative paucity in terms of digital surveillance's contribution to public health is worth the risk of infringing civil liberties. So, a second and more promising course is to invest in envisioning health. COVID-19 has revealed something that should have been obvious—infectious diseases are not matters for microbes alone, they are intra-actions that involve microbes, hosts and environments (Hinchliffe et al. 2016). COVID-19 has, like most other diseases in history, been a disease of inequality and structural violence (Bambra et al. 2020). The humanitarian and economic logic is clear; we need to shift the surveillant gaze from infection to infectability, and from looking down to looking after. Too much disease surveillance is based on the principle of incursion and too little on addressing the risks associated with widening inequalities that lead to vulnerable bodies and systematically compromised groups within society. The hotspots of this emergent disease started in classic virus hunting territory (the rapidly changing habitats of southern and central China) but ended in care homes and meat plants, in structurally disadvantaged and racialised bodies and in those countries where a neglect of social care, health and well-being has become part and parcel of a neoliberal executive order. The object of oversight, and the definition of preparedness, needs to shift from microbes and behaviours to the social conditions of and access to universal welfare and security.

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Chapter 23
Contradictory and Compounding: The Social Implications of COVID-19

Geoffrey DeVerteuil

COVID-19 is a health issue, but like all pandemics, it is also deeply social and economic. By that, I mean the medical realities of the pandemic are necessarily filtered by preexisting social and economic structures, including the degree to which a particular society is (un)equal across class, race, gender, and so forth, which in turn feeds into who is exposed to the disease and how coherent the response to COVID-19 can be. In other words, pandemics invariably expose deep-seated social and economic inequalities. My approach to understanding the economic and social consequences of COVID-19 is framed by such a perspective, one which provides a rather different view than a purely biomedical one. Equally, the epidemiological aspects of the disease must pass through distinctly geographical filters, in which societal and economic structures are spatially uneven, producing wildly varied life chances and expectancies even before the pandemic struck, but are sure to be accentuated by it. One way to capture both the social/economic and the spatial is to adopt a social geographical perspective. According to Smith et al. (2010, p. 1), social geography is defined as "the study of social relations and the spatial structures that underpin those relations." To Del Casino (2009), the social remains a crucial arena and organizing framework, despite calls for a complete individualization where everyone takes care of their own and where everyone theoretically has the same opportunities. Social identities and groupings—organized through race, gender, (dis)ability, class, nation-states, neighborhoods, or social networks—continue to structure societal inequalities.

More specifically, my approach is informed by three key components of social geography developed by Smith et al. (2010). The first is the sense that social geography has always been committed to "the idea of the social," meaning the need to document the structures and processes that connect societies with space. In my own

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work on the process of substance abuse treatment, I found that the varied social spaces of the city had profound impacts (e.g., DeVerteuil et al. 2007). The second theme is the long-standing preoccupation with the hard edge of inequality and the uneven experience of welfare, involving a multidimensional view in which social structure does not map directly onto class, and where class is but one axis of inclusion (Smith et al. 2010). From my own work, I have focused on how gentrification as a class project threatens to displace both poor people and their services (e.g., DeVerteuil 2015; DeVerteuil et al. 2019). Third and finally, social geography has always been a moral enterprise, characterized by an appreciation for the principles and practicalities of justice, whether as critique or increasingly drawing upon the normative turn in social research, of what ought to be and should become. This perspective has informed my work on the dual role of the voluntary sector is seeking social justice but also as handmaiden of the (receding) welfare state (e.g., DeVerteuil 2014; DeVerteuil et al. 2020). These three components are all understood through ideas around space, place, and urbanity—that a social geographical reading of COVID-19 must take into account how people's lives are place-bound, exposing them to certain vulnerabilities but also resilience that draws strength from long-standing social proximity and density (Spina et al. 2013).

With these themes in mind—the idea of the social, inequality, and social justice—what do I mean by the economic and social consequences of the current global pandemic? The economic and social are tightly interlinked, such that the consequences of the global pandemic and the ensuing mass lockdowns are both economic (e.g., dramatic rise in unemployment) and social (e.g., despair arising from mass unemployment and isolation). Moreover, these consequences are both immediate and pervasive, and potentially long-lasting. Based on the first 7 months of the pandemic, several *immediate* consequences are already apparent which straddle the social and the economic. First and foremost is the drastic rise in unemployment to levels not seen since the 1930s, alongside an increased exposure to the virus for those deemed "essential" workers who must operate in close proximity to the public, including meat packers, nurses and doctors, prison wardens, waiters and waitresses, and care workers. A direct cause of this sudden mass unemployment is the concept of social distancing as a way to minimize mass infection. This dynamic renders most in-person activities highly problematic, from teaching to caring to serving. As such, the immediate consequences of the pandemic cannot be divorced from the idea of the social joined to certain problematic spaces such as prisons, care homes, restaurants, and hospitals. The pandemic has also arguably exposed many long-ignored health and social inequalities, from the scandalously neglected state of care homes to the inequitable reliance upon, and overexposure among, the precarious working poor. In turn, the 'rediscovery' of these glaring inequalities could lead to social justice movements seeking large-scale restructuring, a point to which I return in the conclusions. Beyond these class-based issues, COVID-19 will undoubtedly worsen preexisting inequalities along racial and gender lines. For instance, in the US and UK, racialized minorities have been more prone to the disease, and more likely to die from it. This stems from being more exposed to air pollution, overcrowding, segregation, and poor food availability, all of which suggest that the

pandemic exacerbates various preexisting place-based vulnerabilities rather than a solely genetic determination. Surprisingly, it is men that are more prone to dying from COVID-19, and part of this trend could indeed be social—less willingness to wear face masks, more underlying health conditions, and more likely to be living alone.

These socioeconomic consequences, and their social geographic implications, can be further sharpened via two key relationships. The first of these relationships is contradictory. In effect, social distancing will necessarily undermine what sociologist Eric Klinenberg (2018) called "social infrastructure," undercutting tightly knit social spaces of the city. Social infrastructure, according to Klinenberg (2018), is "informal, incremental, peopled…infrastructure that supports social reproduction in cities." Klinenberg underlines that social infrastructure are "physical places and organizations that shape the way people interact," not social capital "but the physical conditions that determine whether social capital develops. When social infrastructure is robust, it fosters contact, mutual support, and collaboration among friends and neighbors; when degraded, it inhibits social activity, leaving families and individuals to fend for themselves" (Klinenberg 2018, p. 5). Social infrastructure brings the spatial and social together in particular places, such as libraries, pools, public transit, care homes, and food markets. Crucially, social infrastructure is designed to be highly accessible; as Klinenberg (2018, p. 124) argues, vulnerable populations "need an environment that's not like every other environment they've ever known, that judges them, that takes advantage of them, that doesn't want anything to do with them, doesn't understand their role in society." Latham and Layton (2019) saw the crucially public nature of social infrastructure—that the state, or some other collectivity (such as the voluntary sector), can provide social infrastructure for public and private use. As such, social infrastructure is particularly important to vulnerable populations, such as the homeless, the elderly, and refugees, all of whom have been particularly forgotten in the current crisis, or worse, a target for stigma through places such as care homes, homeless shelters, and prisons. The threat posed by social distancing—and lingering feelings of concern around being in close proximity to precarious and vulnerable populations—speak to the idea of the social underpinned by particular places. The current pandemic places great pressure on social infrastructure just as it is being curbed by social distancing and places added stigma upon those deemed precarious, vulnerable, and even redundant.

The second key relationship is the compounding effects of how catastrophic economic hardship will only worsen the preexisting crisis of "deaths of despair" in certain countries, speaking to the themes of inequality and perhaps even social justice. Case and Deaton (2020) frame "deaths of despair" in essentially socioeconomic terms—of how cases of suicide, drug and alcohol poisoning, and alcoholic liver disease have been rising in certain Global North countries over the past 30 years, especially the USA but also the UK. This rise has been especially acute among working-class adults within deindustrialized areas. Between 1999 and 2017, the rate of drug overdose deaths among Americans between 25 and 64 increased fourfold, from 6.7 per 100,000 in this age group to 32.5 per 100,000 (Woolf and Shoomaker 2019). Alongside this, suicide rates in this same age group increased to

38.3% during the same 18-year period (Woolf and Shoomaker 2019). Midlife death rates also increased for illnesses that are strongly linked to drug use and alcoholism; midlife deaths from alcoholic liver disease grew by 40% (Woolf and Shoomaker 2019). Finally, deaths from liver cancer in this age group bucked a trend of decline in virtually all cancer deaths to grow 60%, while alcohol poisoning deaths among those 25–64 rose almost fourfold. As a consequence, life expectancy in the USA began dropping in the late 2010s, even before the pandemic. In the UK, both liver disease and overdose deaths have increased since 2010 (ONS 2018; UK Government 2018). Of course, the social and geographic distribution of these "deaths of despair" is hardly random—it impacts areas and people marked by long-term deindustrialization, high unemployment, ill-health, and austerity, as well as social isolation and a lack of social infrastructure. In particular, being alone generates greater risk for overdose; the pandemic worsens this isolation by cutting the face-to-face social ties that bind addicts in recovery. Given its disproportionate impacts on poor people and poor places, as well as creating a large pool of newly unemployed people, the pandemic is set to compound preexisting and inequitable spatial patterns. This will negatively impact the worst-off and most vulnerable areas and reinforce their social precarity.

In conclusion, I have focused on short-term, immediate economic and social consequences of the global pandemic from a social geographical perspective. However, we ought to think long term about the consequences, the chronic rather than just the acute impacts. This could generate a future research agenda on, for example, the eventual vaccination of the population against COVID-19, if it indeed happens. From a biomedical perspective, this would involve the relatively straightforward diffusion of the vaccine across places and populations. However, from a social geographical perspective, the uptake would probably be very uneven across various social identifiers and places—not all populations will have full access, and some populations might even resist the vaccine, seeing it as a form of governmental overreach. But this also plays into the larger question of what kind of post-COVID-19 world do we want? One way to frame long-term consequences is through the irksome concept of resilience, in which the social and economic fallout from COVID-19 prompts calls for both "returning to normal" (e.g., the status quo) and, more radically, establishing the trajectory of a new economic and social contract, one that is more equitable and healthy for more people, especially those currently deemed expendable (DeVerteuil 2015). This division is rather stark—to some, the idea of "bouncing back" to pre-COVID-19 conditions is anathema, while others are striving hard for just that. The balance between these opposing views will very much determine what kind of social and economic system we create (or re-create) in the post-COVID-19 future. And so a future research agenda would also need to critically interrogate the uses and abuses of resilience, appreciating that certain populations benefit from a return to the status quo (especially politicians and CEOs), while for racialized minorities and the working poor, there is a pressing need to radically restructure life changes and systems of well-being, of revisiting economic justice and more strongly redistributional models of society. This cannot be divorced from the particular nature of COVID-19's mortality patterns, which imparts a sense of

intergenerational (in)justice—that younger people are socially isolating partly to ensure the survival of the oldest generation. Yet in return, the younger generation might see its opportunities and social mobility severely restricted, possibly for years, with important social and economic consequences.

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Chapter 24
Geographical Metaphors in Everyday Life

Robin Kearns

1   Introduction

COVID-19 is both a disease and source of dis-ease. This playing with the word 'disease', a concept that lies at the heart of this book's concerns, suggests ways in which different meanings lie within and extend from the units of everyday language. Words are units of conversation and writing, and even dictionary definitions at times struggle to specify their meaning. Yet words are necessary tools for communication, especially in times of urgency such as during a pandemic.

Health geographers have recently taken an interest in words. Gesler (1999), for instance, examined the ways language is used in health-care interactions, helping to create places of medical encounter. Similarly, the names of hospitals have been examined for their symbolism and associated design features (Kearns and Barnett 1999; Kearns et al. 2003). Diseases have also been subject to scrutiny, with geographers examining how people are 'othered' through the stigma attached to the places and people associated with tuberculosis and HIV/AIDS (Kearns 1996; Lawrence et al. 2008).

Across the planet, with attempts to contain infections, the public at large are suddenly using geographically influenced terms like 'sheltering in place', 'social distancing', 'herd immunity', 'containment', and 'flattening the curve'. Use of this new vocabulary has been given momentum by the news media and the advice of public officials (Cassell 1998). The pervasive understanding and use of these terms speak to the way diseases are both medical conditions and social constructions, profoundly influencing places, perceptions, and behaviours as well as the collective imagination (Gilman 1988). Public health practitioners depend, to a large extent, on media outlets to alert the public to threats of disease and opportunities for protection

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(Lawrence et al. 2008). The challenge for public health practitioners is not only managing the exposure of populations to viral risks but also managing more subtle sociocultural and emotion-laden risks (e.g., fear, apathy, and 'fake news'). This chapter reviews ways language is a vector by which disease is inscribed into human experience of everyday places (Kearns 1996). It then briefly introduces the New Zealand experience of the pandemic before examining the use of spatialized metaphors in the nation's successful campaign to eliminate community transmission of the virus in March to June 2020.

2 Media and Metaphors

The news media is an important vehicle through which the state and its agencies can convey the key messages embedded in otherwise complex health policies and epidemiological understandings (Hayes et al. 2007). The 'media' are agents in achieving what Rose (1990) calls governing populations. This occurs through influencing (directly or indirectly) the conduct of its audience.

There is a long tradition of tropes entering the public imagination and playing on the spatial origins and agency of viruses. For instance, COVID-19, like AIDS and other viral afflictions throughout human history, has been attributed to 'them' rather than 'us', despite the global space economy facilitating its speed of transmission (Kearns 1996). In a classic case of othering, the former President of the United States has repeatedly referred to COVID-19 as the 'Wuhan virus' (Viala-Gaudefroy and Lindaman 2020).

This attribution of blame is connected to the human urge to tell stories. We all participate in the processes of 'storying', which often draws on metaphor to craft discourses related to disease (Kearns 1997). Metaphor is the application of a word or idea to something which is imaginatively but not literally applicable (Lakoff and Johnson 1980). Sontag (1978), for instance, showed how cancer has variously over time stood for corruption, catastrophe, and evil. In turbulent times, metaphors abound as people strive to link the unfamiliar with the familiar and make sense of the world. Hence, the use of metaphors amounts to a discursive coping strategy deployed by interpretative communities to construct understandings of their changing lives and places (Kearns 1997).

Given the multivocality inherent in metaphor, there are no fixed meanings but rather sets of implied connections. Hence, one outcome of researching geographical metaphors is likely to be a continued release of new connections and understandings. This novelty is because such any investigation involves '…analogical leaps from the familiar to the unfamiliar which rally imagination and emotion as well as intellect' (Buttimer 1982, p. 90). In the remainder of the chapter, I briefly survey the New Zealand experience of COVID-19 and then examine aspects of three metaphors deployed by the New Zealand's Prime Minister and the Director General of Health: 'levels', 'bubbles', and the 'team of five million'.

3   The New Zealand COVID-19 Experience

The first case of the virus was reported on February 28, 2020. At this time, public health experts urged the government to act with great urgency, convinced that New Zealand could stop the virus from spreading—and even wipe it out entirely—if a lockdown was implemented strictly and swiftly. In daily press conferences, Prime Minister Jacinda Ardern and Director General of Health Ashley Bloomfield used language aimed at mobilizing the public. The first element was 'levels', ranging from Level 4 (complete lockdown) to Level 1 (border control, but business as usual). With an emergency alert message sent to the cell phones of all New Zealanders on March 23, Level 3 was imposed and 'normal' life temporarily suspended. A national state of emergency (Level 4) was then in place from March 25 until May 13, 2020. The nation returned to Level 1 on midnight June 8 (Klein 2020). What followed was a period of 102 days until a community outbreak in Auckland broke New Zealand's 'dream run'.

As in other countries, an early challenge was a potential disconnect between the language of epidemiology and that of everyday life. By way of example, a term like elimination was used in press conferences by the Director General of Health in reference to achieving a complete and permanent reduction to zero new cases within the island nation (https://vaccine-safety-training.org/). However, using the term when there were recovering patients in hospital and new cases arriving into quarantine at the border confused a public for whom elimination was understood to be no cases anywhere in the country. In response, three spatial metaphors that connected more potently with everyday geographical experience were increasingly used. These metaphors aligned with both national identity and the Prime Minister's leadership style, described as 'clear, consistent, and somehow simultaneously sobering and soothing' (Friedman 2020).

4   Three Spatial Metaphors

The first spatial metaphor universally applied in New Zealand has been 'levels'. These are associated with the alert system introduced by the Ministry of Health in March 2020 and were deployed 'to manage and minimise the risk of COVID-19 in New Zealand' and aimed at 'helping people understand the current level of risk and the restrictions that must be followed' (Ministry of Health 2020). In shorthand, and in terms of human contact, these equate to Level 1, Prepare; Level 2, Reduce; Level 3, Restrict; and Level 4, Lockdown (Ministry of Health 2020). The notion of 'levels' implies potential elevation, creating an effective spatial metaphor for directional movement between states of relative concern and alertness.

As in an elevator, in which the levels of exit onto floors of a building are enumerated, the rapid movement upward into high alert implies a corresponding seclusion away from the ground of usual activities and everyday life. Given that a lower level

implies potential for ascent to a higher level, the use of this metaphor from the beginning of the crisis assisted in preparing the public for a step-up in seriousness. When asked, for instance, what Level 3 would be like, the Prime Minister described it as a 'waiting room where we wait it out and make sure we've got it right' (Shahtahmasebi 2020). As this sub-metaphor implies, waiting rooms are places where people need to be patient and spaces between the surveillance and anxiety of the consultation room and the community outside (Kearns et al. 2020).

The second spatial metaphor shaping the geographies of everyday life under COVID has been 'bubbles'. Dr. Tristram Ingham of University of Otago came up with the COVID-19 'bubble' concept that was subsequently adopted by the Prime Minister and widely used in the government's response to the virus. His goal was making public health messages 'simple and empowering so that people can have some sense of control' (RNZ 2020). New Zealanders were urged to quickly identify 'the people [who] will be in your life consistently over this period of time' and 'settle on your bubble' (Wade 2020). Ardern offered a rationale for severe policies using everyday examples. Kiwis should 'stay local, in their bubbles', she said, because driving to a distant destination could lead to increased possibility of a breakdown or accident and others' bubbles then being compromised (Wade 2020). Those who knowingly broke bubbles were subject to warnings and potential arrest and, in vernacular, branded 'covidiots' for letting down the team.

The bubble metaphor is malleable and, like levels, has easy allusion to everyday life. Bubbles can be of different sizes but, regardless, take the same form; they are enclosed spaces and can burst when they collide with other bubbles or objects. To emphasize the importance of maintaining an enclosed sense of social cohesion among one's chosen household grouping, the implied transparency of a bubble is useful; you can look out through bubbles to the outside world. They take up space, but they can move across space. In other words, performing everyday activities with and within your bubble is possible. And given the fascination with blowing bubbles among children, it is a happy coincidence that bubbles are a fun as well as accessible metaphor for the needed seclusion within a chosen grouping to minimize viral transmission.

The third spatial metaphor deployed to socialize compliance with COVID restrictions was 'the team'. This metaphor was easily adaptable to emphasizing loyalty and commitment of purpose to a nation besotted with sporting successes. Evoking the talk of an All Blacks rugby captain, the Prime Minister repeatedly justified the rapid move to restrictions and border closures with the importance of 'going hard and going early', a reference to front-footing an assertive style of play. In her press briefings, she spoke of 'everyone on the team of 5 million having a part to play' (referring to the approximate size of the nation's population and implying that everyone had a role) (TVNZ 2020). While a unit of social organization, a team always plays some*where,* and in this case, that *where* was the social landscape of the nation itself. Extending the team metaphor out from sport to a military context, the Prime Minister also reminded the public not to be complacent: 'we may have won some battles but we haven't won the war' (Ardern 2020).

Being on a team involves compliance to rules, and in the words of the Prime Minister, 'winning is important, but so is looking out for each other' (Wilson 2020). In other words, there is a moral dimension to any victory. With kindness as well as resoluteness co-equally important, New Zealanders generally maintained their bubbles through levels of lockdown. On a playing field, a strong sports team needs a spirit and unity, not just the talents of a set of individuals. When the promise of moving down levels was within sight, Director General of Health, Ashley Bloomfield, said, 'The last thing we should do is celebrate success before the full-time whistle blows' (Small 2020). In other words, a team stays together on the field and continues the work until victory is officially declared.

5   Conclusion

The positivist science that underpins epidemiology is concerned with revealing singular truths about the origins, transmission, and trajectory of disease. While metaphors can mean different things to different people, carefully chosen images can serve to rally a population around a cause and reshape members' geographies of everyday life. This work of metaphorical discourse is what occurred in the case of the messaging from public health and political leadership in New Zealand in the first half of 2020. In light of the invisibility of virus particles, and the relatively few cases of COVID-19 itself, a population must be 'won over' and convinced of the need for compliance. That a high level of compliance occurred in New Zealand, and community transmission was halted for 102 days following April 2020, speaks to the power of clear messages. It also speaks to the strength of the metaphors chosen to do important work, enter everyday vocabulary, and generate resolve within a population at risk of fear as well as contagion. At a more general level, this exploration of the place of metaphor in (re)shaping the geographies of everyday life during the COVID-19 pandemic contributes to literature by health geographers and other researchers on the potency of language. Further research might usefully explore lay languages for disease and delve more deeply into the role of humour in countering anxiety around contagion and points of disconnect between scientific and lay understandings of the words in wards, in print, and on the airwaves.

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Chapter 25
Vaccine Geopolitics During COVID-19: How Pandemics Thicken Borders, Exacerbate Violence, and Deepen Existing Fault Lines

Jennifer Hyndman

1 Introduction

An April 2020 cover of the New York Times magazine shows an arresting image of thousands of young Afghan men waiting to cross from Iran into Afghanistan. A few of them wear masks; there is no room to practice physical distancing as they crush together at the border crossing in Herat Province (Mashal 2020). The article raises a disturbing question: How can Afghans who fled in one direction to evade violence and loss of livelihood at home now be expected to find peace in their home country, still characterized by widespread insecurity, and with few resources to manage the COVID-19 outbreak?

> In many ways, the Afghan experience is a microcosm of the virus's reach into the most precarious parts of the developing world, where climate change, food shortages, violence and territorial disputes have created circumstances dangerously ideal for the rapid and uncontrollable spread of a disease. And what could perhaps be an unprecedented moment in modern history, there may be no superpower left untouched that can afford to offer help (Mashal 2020, p. 30).

No superpower left to help? The world's superpowers are having a difficult time managing the novel coronavirus. And the geopolitical jostling and superiority of states to protect their people are important issues for geographers.

And then another, ongoing pandemic reemerges: anti-Black racism and related police violence. The May 25, 2020 video of George Floyd's death shows a police officer kneeling on his throat for almost eight minutes, eventually killing him. Protests ignited across the country and the world. On June 1, 2020, United States (US) President Trump declared "law and order" curfews and ordered "domination"

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of civil society across American cities. In the society governed by this superpower state, race is one of the starkest public health fault lines during the COVID-19 pandemic, but anti-Black racism long predated COVID-19.

This short piece makes *two related arguments*; first, those facing "dual disasters"—defined as two or more crises at once—will experience more acute losses of life and livelihood than those who face COVID-19 without preexisting marginalization or exclusions. Echoing health professionals and many others, I include anti-Black racism as a public health pandemic in my brief analysis. Second, despite unprecedented social, economic, and even political globalization, COVID-19 and its effects have fragmented the world into much more state-centered parts. This balkanization contributes to and is also an outcome of more nationalist "vaccine geopolitics" where borders thicken and biosecurity becomes part of a heightened "homeland" security.

2 Dual Disasters: Two Pandemics at Once

When more than one humanitarian emergency occurs simultaneously, deeper and disparate consequences are generated, particularly for those *already* impoverished or adversely affected by disaster (Hyndman 2011). The tragic death of George Floyd is instructive. As Mike Griffin, an organizer in Minneapolis, argued, "I'm just as likely to die from a cop as I am from Covid…. It's really a simple question: 'Am I going to let a disease kill me or am I going to let the system—the police?" (cited in Stolberg 2020). Anti-Black racism has been declared a pandemic in its own right. Systemic racism has been identified as a public health crisis for some time, and while racism may have been incorporated into a social determinants of health framework, it has not been layered politically and analytically on top of a pandemic like COVID-19. This short intervention must address this gap in thinking, based on words of Roxane Gay:

> Eventually, doctors will find a coronavirus vaccine, but black people will continue to wait, despite the futility of hope, for a cure for racism. We will live with the knowledge that a hashtag is not a vaccine for white supremacy…. The rest of the world yearns to get back to normal. For black people, normal is the very thing from which we yearn to be free (Gay 2020, p. 3).

Sheryl G. Stolberg (2020) notes that "Black Americans are bearing the brunt of *three* crises—police violence, crushing unemployment and the deadliest infectious disease threat in a century—that have laid bare longstanding injustice." George Floyd is a case in point. When he died, he had coronavirus antibodies in his blood; he survived COVID-19 only to die in police custody (ibid.). In June 2020, data revealed that less than half of Black American adults have a job. COVID-19 has amplified and exacerbated racial inequalities in terms of economic consequences (Smialek and Tankersley 2020). What is more, health-care access is often tied to employment, which has also been adversely affected.

Jumping scales to Afghanistan in the example above, violence and displacement meet COVID-19 in a country that ranks 170th on the human development index. Afghans have been subject to arguably more geopolitical fallout from proxy super-power wars on their soil than any other people in the world. Unsurprisingly, in this post-Cold War, post-US withdrawal of troops moment, they have no superpower country to rely upon.

3   Balkanization Amid Globalization

The second part of the argument is that a clumsy and defensive "vaccine geopoli-tics" has emerged in response to COVID-19, one that thickens borders and balkan-izes nation states. Existing inequalities become more apparent, and the politicization of the pandemic proves to be a public health disaster. Despite a functionally inte-grated global economy crosscut with transnational families, hypermobile tourists, and regional interdependence in terms of food supply chains, globalization has been truncated, slowed, and changed by COVID-19 (*The new normal* 2020).

David Harvey's (1990) theorization of globalization as time-space compression is illustrative. The functional integration of places across the globe occurs though innovations in communications and transportation have effectively shrunk our expe-rience of distance in the world. Technological innovations connect us with family and friends, not to mention services and products, thousands of kilometers away more quickly and efficiently than ever before. COVID-19 too travelled quickly across these integrated pathways, largely ignoring international borders until they closed to nonessential traffic. For a time, preserving life took precedence over pre-serving jobs and the economies that rapidly began to decline.

Those with homes retreated to them, practicing social isolation and physical dis-tancing. Having enough space to practice these highly spatialized forms of isolation to slow the spread of COVID is a luxury to many; people who face homelessness or low incomes that provide only tight quarters, often with multiple generations living together, face other risks, especially where one person in the household is a frontline worker. The consequences of COVID-19 affect all of us, but not equally.

International borders initially closed; slowly and selectively, they reopened to those countries who are able to get COVID under control but then closed again in some places as a second wave emerged. Close to my home, the Canada-US border remains mostly closed in late 2020 as COVID-19 outbreaks on both sides of the border surge. Professor Steven Hoffman (2020) contends that international borders may not need to remain closed, speaking specifically of the Canada-US frontier, because the 2-week quarantine requirement, if followed strictly, screens and isolates the sick before they spread COVID-19. While passports are still required, biosecu-rity measures like mandatory quarantine monitor travellers in theory. At the time of writing, however, polls show that the vast majority of Canadians want to keep the border closed.

COVID-19 has produced a concern with "homeland" security that shows a preference for less integration with the United States, at least for the moment. One silver lining to the nationalistic geopolitics of home is an enhanced sense of *nationness,* or "imagined political community" (Anderson 1983), among people living in a given state. Because COVID-19 is being largely managed (or not) by national governments, with the help of municipal, provincial, and regional entities, people are receiving some shared messaging vis-à-vis media feeds and shared experience of the policy during the pandemic, though many contend the messaging is confusing and government precautions at different scales do not align. Political theorist Chantal Mouffe (2016) illustrated the antagonistic role of the "constitutive outside," whereby a person, place, or phenomenon is defined against an external limit or other. During COVID-19, the United States is arguably the constitutive outside for Canada.

Returning to the balkanization of states during COVID, the geopolitical race for a vaccine echoes the arms races of the Cold War, as Russians are caught trying to steal data on British, American, and Canadian vaccine research (Sabbagh and Roth 2020), and a US president tries to corner the market on any new vaccine for "America First." In 2020, the US government has granted half of a billion dollars each to two US companies, Johnson & Johnson and Moderna, to develop a vaccine for the US market. The palpable competition among governments to be first to find and prove a vaccine effective against COVID-19 continues but appears to be—at least in part—a nativist quest to save one's own citizens first and foremost (Sanger et al. 2020, pp. 14–15). "In an era of intense nationalism, the geopolitics of the vaccine race are growing as complex as the medicine." Espionage and theft by governments of biomedical research are not new, and the assistant attorney general for national security in the United States, John C. Demers, noted on May 1 that "putting aside the commercial value, there would be great geopolitical significance to being the first to develop a treatment or vaccine.… Given the stakes, it is no surprise that while scientists and doctors talk about finding a "global vaccine," national leaders emphasize immunizing their own populations first" (cited by Sanger et al. 2020, p. 1, 14).

The deep political tension between a globalized approach and a nationalist one is clear; political leaders in the United States, China, and India have all said they will prioritize their own citizens for the vaccine first. Yet as Dan Barouch, one US medical researcher at Harvard who is partly funded by a Chinese billionaire who split his philanthropic research dollars between China and the United States, said, "We are not racing against each other, we are racing the virus" (Sanger et al. 2020, p. 14).

> The political reality is that it be would [sic] very, very hard for any government to allow a vaccine made in their own country to be exported while there was a major problem at home," says Sandy Douglas, a researcher at the University of Oxford. "The only solution is to make a hell of a lot of vaccine in a lot of different places (cited in Sanger et al. 2020, p. 15).

Global cooperation among superpower and wealthy states, and the large drug production companies, does not appear self-evident. As Peter Piot, a virologist with

decades of experience strategizing responses to Ebola and HIV, states succinctly, "[l]et's be clear: Without a coronavirus vaccine, we will never be able to live normally again." He goes on to say, "The only real exit strategy from this crisis is a vaccine that can be rolled out worldwide. That means producing billions of doses of it, which, in itself, is a huge challenge in terms of manufacturing logistics. And despite the efforts, it is still not even certain that developing a COVID-19 vaccine is possible." Promising vaccine developments are revealed as they occur as both Pfizer and Moderna bolstered hope at the end of 2020 that immunity might be in sight.

The World Health Organization (WHO), a United Nations body that emerged after WWII to improve global health across the world, has proven to be a site of intense geopolitical struggle. On one level, the United States under President Trump decided to withdraw its funding from the WHO, arguing that the agency failed to alert its member states early enough about the seriousness of the pandemic. Analysts have said that the political vacuum created by the US withdrawal is just the political space and influence that China would like to occupy in global geopolitical context.

4   Conclusion

The health and well-being of people in one locale have never been so tied to the health status of people in faraway places. And yet dual or multiple disasters coinciding—the pandemics of COVID-19 and anti-Black racism as a start—produce death and dispossession, accentuating disparities at home and across the world as COVID-19 accentuates existing fault lines of inequality and vulnerability (Hyndman 2011). Many more Black lives have been lost in this pandemic. The inequities in accessing health systems, particularly in the United States, and in socioeconomic status have led to preventable deaths. Tying health-care access to employment status only exacerbates risks for those already facing economic discrimination and social marginalization.

Our globalized world is breaking up. The geopolitical balkanization among states continues apace. Closing borders is a blunt tool, but such is also a barometer of this fragmentation and its defensive homeland politics. Yet in this intensely globalized world now affected by COVID-19, there is no "over there." While international cooperation on vaccine development against COVID-19 is impressive on some fronts (i.e., COVAX), competition among states for a vaccine, personal protective equipment (PPE), and other medical supplies is clear. While vaccine geopolitics may pit our countries against one another, international cooperation to create a global vaccine plan is essential for anyone to be safe.

Responding to the pandemics of COVID-19 and anti-Black racism demands a "new normal." As Gay notes above, "The rest of the world yearns to get back to normal. For black people, normal is the very thing from which we yearn to be free" (Gay 2020, p. 3). Crisis can create new political space for change. It must.

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Chapter 26
Geographies of Digital Storytelling: Care and Harm in a Pandemic

Jessica McLean and Sophia Maalsen

1 Introduction

Care and harm during crises take many forms, and one compelling way to reveal these practices is through digital storytelling. Digital storytelling uses digital technologies and media to capture narratives that are user-generated. This chapter canvasses how communities are continuing to respond to changing social, economic, cultural, and spatial dynamics during the COVID-19 pandemic by examining digital storytelling of care and harm relations.

Care is defined by Fisher and Tronto (1990, p. 40) as "everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible." As the boundaries between public and private places have blurred with spatial and physical distancing, digital devices have enabled forms of care with a new intensity. A critical digital geographic approach (Ash et al. 2019; McLean 2020) is underpinning this chapter to understand the effects of these changes as it uses an integrated lens on spatial and justice issues.

We are particularly interested in rethinking what a story is in the context of digital storytelling, including the multiplicity of what storytelling is and could be. For example, can digital stories be curated and at other times spontaneous, what forms of authorship are possible, and could the digital encourage a range of stories from the complete to the always being made, produced from images, text, and sound? These are questions and speculations that invite examination in future empirical research.

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2   Digital Geographies and COVID-19 Pandemic Conditions

Around the world, digital geographies are being remade in the COVID-19 pandemic, from increased surveillance with digital devices to facilitation of new spatial boundaries for work and recreation. Datta (2020) analyzes how smart technologies that were in development for smart cities programs in India have been co-opted to facilitate monitoring and tracking of infected people and who they engage with. Drones and CCTV are key to the transformation of these digital surveillance approaches, but also new apps facilitate selfie-taking by individuals as proof of compliance with quarantine measures. The use of these images by the state are not transparent, and Datta (2020) argues that the selfie has effectively become a subject of the digital state.

Meanwhile, platforms such as Google (Cinnamon 2020) and Airbnb (Bosma 2020) are using the COVID-19 pandemic as an opportunity to deepen and extend their reach. Cinnamon (2020) evaluates how Google's Community Mobility Reports takes data from users who enable location history on their devices and produce reports for 131 countries on mass movement in public and private transport. Airbnb has been affected by the downturn in travel and tourism globally but is working to develop partnerships with government and not-for-profits to facilitate housing solutions (Bosma 2020). Home, frequently a space associated with care and labor, is also being reconfigured as digital technologies amplify the extradomestic flows of home, with platforms and technologies enabling a shift to working, studying, and quarantining at home (Maalsen and Dowling 2020). These digitally enabled extradomestic flows can produce spaces of both care and harm.

The digital is consequently an important site of intersection in our response to, working through, and living with the pandemic, and digital storytelling is playing an important role in these practices. Digital geographies need to pay attention to these narratives and the digital's curative and poisonous potentials (Kinsley et al. 2020; Stiegler 2012). Below, we illustrate how enrolling the digital to help us tell our stories can enable both care and harm.

3   What Is Digital Storytelling?

Digital storytelling has been defined as a way of using storytelling, digital technologies, and reflective practice to shape the making of short videos to communicate personal or community stories (Cueva et al. 2013). Digital storytelling enables people to express their experiences in a potentially controlled and empowering way and therefore works well as a method to gain understanding of how people respond to crises.

Digital storytelling has been used to bridge different storytelling traditions that may be crucial at health crisis points (Cueva et al. 2013). In Cueva's (Cueva et al. 2013) research, community health workers watched a series of digital stories to help

them understand the everyday lived realities of people with cancer. They also had to produce a cancer-related digital story. In this context, digital storytelling was an appropriate and sensitive method for increasing cultural sensitivity and nurtured powerful learning. Similarly, Gubrium et al. (2015) describe how digital storytelling is a generative way of communicating life-stage changes such as mothering and the new ways of seeing and doing that come with such a role.

Digital storytelling has been used in occupational therapy to promote self-expression, build community identity, and enrich patient education (Lal et al. 2015). As an educational tool, it has helped occupational therapists gain greater empathy and understanding for patient-carer relations (Lal et al. 2015). Digital storytelling also transcends the traditional confines of learning processes—breaking the text-based, linear work that characterizes much of Western-oriented learning.

Previous research has shown that digital technologies and media are pivotal for establishing individual and community identity, facilitating resistance to discrimination (Carlson and Dreher 2018). In geographic research, digital storytelling is a powerful tool for communicating and learning from social and cultural change. For instance, digital storytelling has been used to facilitate unsettling of colonial practices. Castleden et al. (2013) detail how a field trip involving undergraduate students in Canada required the production of digital stories to transform geographies of ignorance. Students were taught how to create a script, how to use iMovie (an Apple environment app), and how to storyboard their narratives. The results show how important this method was in terms of providing avenues for transformation, supported expression of vulnerability, and opened up previously accepted discourses of colonial hegemony. Castleden et al. (2013) show how students were able to emotionally, mentally, physically, and spiritually engage with the challenges that Indigenous people experience due to settler-colonial practices by using digital storytelling. Similarly, in the context of the COVID-19 pandemic, digital storytelling can help bear witness to the diverse experiences of people in health and social crises.

4 Care and Harm in Digital Storytelling

Research on care as a concept has shown that it can help us understand vulnerabilities and enable more just worlds. Williams (2017) shows that "care-full" approaches to urban places can break down categories that separate private/public spaces. Frequently, care is seen as limited to the domestic sphere while justice is positioned as a public good. With COVID-19 pandemic conditions, the blurring of the domestic and public is common as children are cared for and educated at home, while remote school support and social "public" spaces are regulated differently, through new laws and policing. This is an apt moment to turn to ideas of care as central to justice approaches rather than peripheral. By centering care in digital storytelling, it may become clear how diverse communities have experienced this global crisis.

The processes of caring are a key focus of this research and will be a theme in developing analysis of digital stories. Protecting vulnerable populations from social

and natural disasters involves attending to the care practices already in place and enhancing these capacities. Being careful also evokes watchfulness, or a precaution-ary approach, that acknowledges that sometimes even the most well-intended inter-actions can have harmful impacts (Newstead 2009).

Care is frequently framed as an individual, familial, or a community-owned pro-cess, one that is separated from public lives, except for in the context of health or education. However, there is growing recognition that care need not be framed as such and that expanding the scope of who or what does care is an important part of critiquing capitalist processes. In this way, responsibilities of care are situated in particular places, within cultural contexts, and understood as socially constructed.

As teachers and researchers, geography academics have been "doing care" for some time (for example, Dombroski et al. 2019; Healy 2008; Power and Bergan 2019; McLean et al. 2019) and thinking about responsibility in connection to care too (Massey 2004; Gibson-Graham 2008). Responsibility and care are connected relationally in this literature: between/within institutions, communities, individuals, and families.

Attending to both the caring and harmful capacities of digital storytelling requires understanding the materialities of care, which considers the way bodies, objects, and materials shape care in more-than-human ways (Power and Williams 2019). Digital spaces are not necessarily safe spaces, and there are numerous examples of where digital communication technologies have facilitated harmful experiences (for example, Aghazadeh et al. 2018). While there is care in the ability of the digital to "democratize storytelling" (Dush 2013), there is also a need to minimize harm. Research reveals the complexities of communicating traumatic experiences through digital storytelling and the importance of ensuring participants are aware of the potential harm that can come from exercising their voice (Gubrium et al. 2016). For example, Gubrium et al. show that the value of coproducing knowledge with participants through digital storytelling in health research and practice requires addressing several challenges: fuzzy boundaries, recruitment, and consent to participate, power of shaping, representation and harm, con-fidentiality, and release of materials (Gubrium et al. 2014, p. 1606).

Addressing each of these underpins a situated ethics of practice, necessary for engaging in digital storytelling in order to reduce risk to participants (Gubrium et al. 2014). While digital storytelling has the capacity to share different voices and situated knowledges, its potential can only be reached when this is done in ways that reduce the risk of harm to those who have made themselves vulnerable by sharing their story.

5   Conclusion: Geographies of Care and Harm in Digital Storytelling

There is a spatiality to digital storytelling and relations of care/harm. The connec-tion between places and spaces is important, and different scales can interplay to make digital storytelling effective or otherwise. For instance, in the early stages of the COVID-19 pandemic in Australia (April 2020), videos were shared on social

media of animals moving into urban areas, including elephants taking over streets in Thailand, goats eating manicured hedges in England, and a pride of lions on a golf course in South Africa. The restricted movements of humans facilitated the expansion of space for more-than-humans, and stories of these incursions were shared widely. As a form of digital storytelling, the videos were certainly cute, and we are guilty of adding to the viewing counts. But it also helped to breakdown the notion of public/private spaces further by invoking narratives of rewilding and sharing space with the more-than-human, extending Williams' (2017) notion of "care-full" approaches to urban spaces as destabilizing existing spatial categories. Digital storytelling does not simply reflect how non-digital spaces work (or don't) but tends to amplify, refigure, and allow for distribution of specific narratives. An example of this is the geographic distribution of fines for noncompliance to spatial distancing rules during April 2020 in Sydney. Faruqi (2020) offers a spatial, statistical, and social narrative that demonstrates how, within different parts of Sydney, certain communities were disproportionately targeted for noncompliance with social distancing laws compared to other social groups. The Northern Beaches area (a wealthy part of Sydney) had 5.3% of COVID-19 cases at the time, and 0.53% of infringements, while Fairfield (in western Sydney with a lower socioeconomic status) had 0.98% of cases and 3.7% of infringements. At that stage of COVID-19 in Australia, poorer people were being disproportionately fined and policed for noncompliance with social distancing laws. The digital story that shared this inequity was accompanied by a map showing the uneven application of the laws and was an interesting moment in geographies of care/harm in the pandemic.

Looking at digital stories that show what is and is not working during COVID-19 may help us learn how to navigate preexisting social and economic inequities for ongoing and future crises. It could also help us understand what infrastructure and knowledge is required to support vulnerable peoples. Digital storytelling is a way to share narratives that enables learning about how people adapt during crises. While digital storytelling has been used extensively in health research to share reflections on life transformations including health challenges, it is also used spontaneously as a way for individuals and communities to express how they reflect on moments of transformation. However, the fuzziness of boundaries between care and harm online means that ethical approaches to minimize harm must be considered when making, sharing, and responding to digital stories.

The digital geographies of COVID-19 are articulated in specific ways: there is no inevitability in careful or harm-ridden relations in, and from, digital geographies. Rose-Redwood et al. (2020) point out how digital technologies have been repurposed, become more deeply entrenched in everyday lives, and expanded their reach due to spatial/social distancing measures. What sort of care is possible in a pandemic is being redefined through necessity as spatial relations are shifted to accommodate new protection measures while drawing on preexisting knowledges of how people and communities *do care*. Digital storytelling in this context has emerged as a practical way to share insights on how diverse responses to new risks are functioning. At the same time, preexisting inequities and injustices are highlighted as vulnerabilities to harm are exposed with impositions of regulatory controls and ethical opacity.

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Chapter 27
Animal Geographies in a Pandemic

Richard Gorman

1 Animal Geographies in a Pandemic

The flourishing sub-discipline of animal geography has demonstrated the multiple and complex ways in which humans are enmeshed in social relations with animals. As Philo and Wilbert (2000, p. 4) argue, "any social science which fails to pay at least some attention to these relations, to their differential constitutions and implications, is arguably deficient". Understanding how COVID-19 is (re)shaping human-animal relations is a vital part of any analysis of the pandemic.

Quarantines, lockdowns, and social distancing have acted to reconfigure domestic spaces, with many people spending substantially more time at home. Amidst the many social relationships that this shift enacts, these changes are felt by the companion animals that many of us share our homes with. Veterinarians have warned that this sudden upsurge in closeness and attention is likely to lead to intense separation anxiety for many animals when people begin to return to their routines. For many, animals have been a source of companionship and emotional support during times of uncertainty and stress, highlighting the increasing ways in which animals are integrated into understandings and conceptualisations of 'the social'. With animal care (e.g., dog walking) being a permitted reason for leaving the home during lockdowns in many localities, animal ownership created uneven hierarchies of mobilities—though also anxieties—as people struggled to balance care for their animals with a desire to stay safe and isolated. Other inequalities were exacerbated by people's relationships with companion animals; the reticence of some emergency accommodation providers to welcome pets meant many homeless people had to choose between separation from their companion animals or support. Animal shelters on the other hand faced initial prospects of being overwhelmed by a reported

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rise in pet abandonment, followed by a surge in adoption as volunteers opted to home animals as shelters closed, and as pets became an increasingly valued affective commodity the longer lockdowns lasted.

A critical task of animal geography is exploring the many ways in which animals are 'placed' by human societies, both in terms of material spaces, and in semiotic imaginations and orderings of where (different) animals 'belong' (i.e., pigs on a farm) (Philo and Wilbert 2000). Scholars like Searle and Turnbull (2020) have discussed the rapid proliferation of images and media during the pandemic that aim to demonstrate how animals are 'reclaiming' or 'returning' to normatively 'human spaces', a discourse that relies on the (long critiqued) binary separation of humans and nature. These narratives, Searle and Turnbull argue, both fetishize and obscure 'the everyday-ness of certain ecologies'—that animals are regularly present alongside humans; urban wild boars are not exceptional, just under-visualised.

Animals are central to telling the stories of COVID-19, and as Haraway (2016, p. 12) describes, "it matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with". Animals, and our intensified and industrialised relationships with them, have been the focus of much attention throughout the coronavirus event, with the virus 'blamed' on human-animal encounters, reigniting discussions about globalised agriculture, meat consumption, habitat encroachment, and the exotic wildlife trade. Although the original source and route of viral transmission to humans remains unclear (at the time of writing), this has not stopped much speculation and controversy. Initial genetic sequencing of the SARS-CoV-2 virus traced strong genetic similarities to viruses circulating in wild horseshoe bat populations, but suggested that the virus was probably transmitted to humans by another intermediary animal. Thus potentially following a similar pathway to the 2002 SARS-CoV-1 outbreak, which spread from horseshoe bats to civets before 'jumping' to humans. The involvement of an intermediary animal prompted questions about what human activities provoke the juxtaposition of species and lead to opportunities for interspecies viral transmission—very geographic matters. As events unfolded, a commonly held hypothesis was that the COVID-19 virus emerged at the Huanan Seafood Wholesale Market in Wuhan, as the result of an interaction between an infected animal and a human. However, later analyses have instead theorised that the market was the likely site of a 'super-spreader' event, rather than the primary site of zoonotic spillover. Whatever the case, (mis)imaginations of the geographies of a 'wet market' have become a central part of political and media rhetoric in attempting to apportion origins, in ways that have lodged in the public mind, and led to calls for restrictions on the sale of live animals as well as 'wet markets' themselves. Finding pathways to discuss how we live with other animals which avoids reifying forms of cultural imperialism is a critical task for animal geographers. Zoonotic origin stories have been a key feature of many contemporary epidemics, from Ebola to H1N1 and H5N1. However, as Bezan (2020, para. 9) points out, there is potential that this "myopic focus on zoonotic origin points" risks "bolstering racist and speciesist ideologies". Animals are frequently deployed in the production of cultural difference, particularly through a strict policing over which animals are socially constituted as (im)proper to consume (Elder et al. 1998). A

focus on (or perhaps, moral panic about) local (agri)cultural practices, rather than wider geographic interdependencies, through lodging bats, pangolins, and 'wet-markets' as central to the origin stories of the pandemic serves to absolve capitalist logics and hegemonic forms of animal consumption from blame. Limiting discussions of viral risk to localities ignores the fact that human-animal relations are entangled with globalised economic and political systems (Wallace 2009). As Van Dooren (2020, para. 19) concludes, "the broader reality is that no part of the world has a monopoly on the kind of animal cruelty and destruction of animal lives and habitats that is today driving the production of zoonotic disease". Interrogating the narratives of animals and place emerging during the pandemic is a key task for animal geographers, one that can aid in understanding how such stories are mobilised in producing discourses that enable human and more-than-human exploitation.

Exploring representations of animals is only part of an inquiry into animal geographies—there are also animals' own geographies to consider too; those which Philo and Wilbert (2000, p. 23) describe as "the beastly places made by animals themselves, whether wholly independent of humans or when transgressing, even resisting, human spatial orderings". Whilst the virus has undoubtedly resulted in a restructuring of human lives, the impacts of coronavirus—and the subsequent management strategies deployed to manage these impacts—have more-than-human ramifications. For example, Garlick (2020) describes how the absence of human activity has had disastrous consequences for many animals that have adapted to live commensally alongside humans, decreasing the availability of food for opportunistic feeders; from roadkill-consuming birds of prey, to tourist-fed monkeys. Other commensal species have had to range further than usual, exploring new spaces, to meet their daily food consumption—often in ways that transgress what humans consider established and acceptable boundaries, provoking conflict. Animals' own place making and world building are remapped through the retreat of humans, changing animals' 'landscape of fear', their behaviours, and mobilities (Goldman 2020). Such has the capacity to further change localised geographies, with animal bodies constituted by a wide variety of other bodies, relations, and associations. Indeed, Arregui (2020, para. 7) discusses how the movement of wild boars into urban Barcelona "could increase the presence of tics and pathogens such as enterobacteriaceae in urban parks and green areas". Arregui questions whether this might lead to human-wild boar 'social distancing' in the future, as humans become more cautious about zoonotic transmission.

Questions about whether animals themselves can be infected with COVID-19 have been a matter of interest throughout the pandemic—mainly out of concern that animals might play a role in spreading the virus to humans. Evidence of this has been limited (though changing rapidly), and guidance from the CDC (when this chapter was being written) concluded that the risk of animals spreading COVID-19 to people is low. This has not stopped much speculation and anxiety amongst different publics fearful that animals could spread the virus, a case which led to Dr. Mike Ryan, Executive Director of the World Health Organisation's Health Emergencies Programme, asking people not to retaliate against animals, stating in a press conference:

"It's extremely important that if people worry and have concerns about sources of transmission that we refrain from any act of cruelty to animals. They're beings in their own right and they deserve to be treated with kindness and respect and they are victims like the rest of us." (WHO 2020)

Whilst animal-to-human transmission appears to have been limited, emergent scientific evidence suggests that the virus can spread from people to animals in some situations, with cases of SARS-CoV-2 confirmed in cats, dogs, lions, tigers, and minks who had been in contact with people with COVID-19. The possibility of human-to-animal transmission caused great concern that the pandemic could hit already endangered species, such as great apes, hard. Yet the major source of concern relating to human-to-animal transmission has been that infected animals may then act to further spread (or even, mutate) the virus. Cases of human-to-animal-to-human transmission of SARS-CoV-2 were reported on mink farms in Europe (particularly in the Netherlands and Denmark), leading to government-ordered culls of millions of minks, out of concern that affected animals could act as long-term reservoirs of the disease, frustrating efforts to control the pandemic (Mallapaty 2020). The different values at play—concern and culling—here are examples of how animals are "simultaneously subjectified through biopolitical techniques of government, and objectified as components in a system valued on anthropocentric terms" (Hodgetts 2017, p. 24).

Culls of animals have occurred in other sectors as a response to the pandemic. The closure of slaughterhouses caused a bottleneck in food supply chains, with many agricultural animals unable to be killed for food (despite simultaneous reports of widespread hunger). Opportunities to stop or slow the production cycle within contemporary agribusiness are limited. According to Kevany (2020), in the US alone, more than ten million hens are estimated to have been culled due to COVID-19 related slaughterhouse shutdowns, with the potential for similar numbers within the pork industry. This is a huge reshaping of agricultural geographies and a cause of emotional stress for farmers and others embedded in rural landscapes.

Matters of culling also arose in laboratories, as researchers were faced with difficult choices about the futures of research animals in the face of lockdowns. Some facilities have been forced to euthanize large numbers of animals, focussing on cryopreservation of embryos to preserve specific research programmes. Yet in other laboratories the pandemic has 'skyrocketed the demand for new strains of mice' as part of research into COVID-19—to such an extent that shortages of specific strains were reported (Ananthaswamy 2020). The impact on animals here should not be forgotten; many animal models of coronavirus involve suffering and death.

Elsewhere, non-human labour is being enrolled in the hopes of securitising post-pandemic borders, as efforts to utilize 'bio-detection dogs' to detect potential carriers of the virus are stepped up. Even enigmatic animals like horseshoe crabs are entangled and drawn into efforts to alleviate coronavirus, with the billions of potential vaccines requiring testing for contamination during the production process—a test reliant on the blood of horseshoe crabs. Animals worldwide are enmeshed and impacted through responses to COVID-19, their involvement, and their stories, are a vital part of understanding the new geographies being created by the pandemic.

The pandemic has done much to re-centre and revitalise discussions about human-animal relations, and the entanglements between human and animal health—discussions which geographers are well placed to contribute to.

Geography as a discipline has much to offer in understanding (and indeed, creating a rationale for understanding) the multispecies worlds impacted by, and involved in responding to, coronavirus—and future health crises. The presence of zoonosis at the forefront of societal imaginations has the potential to reconfigure many human-animal relations (Arregui 2020), and demand a new modality of human-animal coexistence (Philo and Wilbert 2000). Geography's engagement with concepts and approaches like biopolitics (Hodgetts 2017), political ecologies (Wallace 2009), and multispecies ethnographies provides the discipline with a strong toolkit and framework to provide insight into (post)pandemic multispecies worlds. Matters of health are always multispecies matters. Responding to a pandemic involves responding to multiple, more-than-human, entangled bodies.

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Chapter 28
Environment and COVID-19: Unpacking the Links

Blake Poland and Mira Ziolo

1 Introduction

In this chapter, we explore the multifaceted relationship between "the environment" and COVID-19, including the environmental impacts of pandemic responses. We begin with the fundamentally environmental origins of COVID-19, situating these in a broader political economy of global capital, before tracing some of the emerging science regarding the ecological "silver linings" of the pandemic as well as the environmental consequences of pandemic responses. We situate these in an emerging picture of clearly uneven social geographies of pandemic impact, tracing all-too-familiar paths along race, class, and gendered lines. We conclude with reflections on prospects for transformative social change afforded by the proverbial "fork in the road" that an anticipated post-COVID world presents. While an extensive review is beyond the scope of this chapter, we offer our reflections as a modest contribution to an emerging scholarship on the geographies of the COVID-19 pandemic (Rose-Redwood et al. 2020 and June 2020 special issue of *Dialogues in Human Geography*) and a longer-standing (though arguably still underpopulated) body of work on the geographies of environmental and climate change (Barnett 2020; Brace and Geoghegan 2010; Curtis and Oven 2011; Head and Gibson 2012; O'Brien 2010; Offen 2013).

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2   A Disaster in the Making?

Despite widespread "conspiracy" theories positing the origins of COVID-19 as either escaped from a lab or intentionally manufactured there, available epidemiological and medical evidence points to animal-to-human transmission in so-called "wet" markets in and around Wuhan, China (Andersen et al. 2020; Vidal 2020). Wet markets are places where fresh produce is sold, not just live animals but also fresh meat, vegetables, and fish. They are an important source of nutrition for lower-income populations, an integral part of local economies, and often carry significant cultural importance (Petrikova et al. 2020). Wet markets are also places where wild animals, such as civets and pangolins, poached from shrinking forests into which humans are encroaching, are sold as "bushmeat," a more affordable source of food for many of the world's most marginalized people (Akpan 2020). These animals, stressed from encroachment on their diminishing forests, are becoming reservoirs of disease ripe for animal-human transmission as encroachment (and the search for bushmeat) forces humans and infected animals into ever closer proximity (Hing et al. 2016; Quammen 2012, 2020). Despite widespread calls for the banning of bushmeat consumption and the closure of wet markets, by some accounts, these nonetheless compare favorably against the larger backdrop of the unsustainability, carbon footprint, and disease risks associated with industrial meat production (Petrikova et al. 2020; Willett et al. 2019). And although live animal markets can pose significant risk for pathogen recombination and emergence into human populations (e.g., H1N1, COVID), there are decades of evidence that industrialized agriculture is a greater threat for zoonotic spillover and planetary health (Jones et al. 2008), raising broader issues of the unsustainability of globalized food and production systems (Arora and Mishra 2020).

It has been shown that 70% of new diseases emerging in humans are zoonotic in nature (FAO 2013; Jones et al. 2008), meaning they are human infectious diseases caused by pathogens (bacteria, parasites, fungi, viruses, among the most infamous) that have animal origin. They are nothing new to our disease history. In most cases, they have been around us for millennia without pandemic harm (Jones et al. 2008; Morens et al. 2020), and indeed, bacteria and the microbiome are as important to our (gut) health (Dethlefsen et al. 2007) as they are to the health of soils (Dubey et al. 2019) and have coevolved with us. With our Neolithic ancestors' changing lifestyle to live in closer proximity to domesticated animals, and subsequent human population growth, pathogens have learned to also expand their territories and infect humans. Over the past 40 years, humanity has experienced an exponential rise in emerging infectious diseases that are zoonoses (Morens et al. 2020). Since 2003, we have experienced SARS, H1N1, MERS, chikungunya, Zika, and Ebola, as well as Lyme disease, West Nile, and numerous multidrug-resistant pathogens (Jones et al. 2008; Morens et al. 2020). Experts say we are in a third epidemiological transition, an era of emerging and reemerging diseases where crises are no longer separated by decades but a matter of years and causing not only health crises but massive socioeconomic disruption (Morens et al. 2020).

Rising zoonotic disease concerns of the twenty-first century have repopularized the approach of One Health, "the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals and our environment" (AVMA 2008). One Health has been embraced as a major solution and institutionalized by national and international agencies such as the World Health Organization (WHO), the United States Agency for International Development, the Food and Agricultural Organization, L'Office International Epizootique, and the World Bank under the auspices of Veterinary Public Health, with a focus on disease surveillance (e.g., virus hunting in high-risk reservoirs), outbreak response, education, and the Global Virome Project (Mackenzie et al. 2013). In the wake of COVID-19, One Health has experienced an explosion of interest (One Health Commission 2020). But do these proffered solutions go far enough to address the underlying drivers of zoonotic disease risk?

3   COVID's Environmental Footprint

A putative environmental silver lining associated with economic slowdown and pandemic containment measures has been widely touted on social media though it may represent only a small positive blip in an otherwise bleak trajectory, easily swamped by the much-anticipated post-pandemic rush to "'return to normal" and ramping back up of economic activity to make up for lost time/production (Simon 2020).

Still, the evidence is intriguing for what it suggests about how quickly disturbed areas can begin to regenerate when human exploitation is dialed back (Wang and Su 2020). A review of the 57 published studies on COVID-19 and the environment (Shakil et al. 2020) suggests significant improvements in air pollution in major cities around the world as a result of reduced mobility (flights as well as personal transportation) and industrial output, as well as reduced environmental noise, and reductions in pollution at beaches and other outdoor public gathering spaces (see also Zambrano-Monserrate et al. 2020). By some accounts, air travel dropped by 96%, with satellite imagery showing a 30% reduction in NO_2 emissions in China and much of Europe, as well as in some parts of the USA (Muhammad et al. 2020). Given the significant contribution of air, water, and soil pollution to human health, some commentators have wondered whether the pandemic saved more lives than it took (Hancock 2020). In their landmark publication, the Lancet Commission on pollution and health showed that pollution is the largest global environmental cause of disease and premature death globally, accounting for an estimated nine million premature deaths in 2015 (16% of all deaths worldwide, and as much as 25% in the most affected areas), three times more than from AIDS, tuberculosis, and malaria combined and 15 times more than from all wars and other forms of violence (Landrigan et al. 2017).

The pandemic has provided an unusual natural experiment for researchers studying the impact of human activity on wildlife, during what Rutz et al. (2020) call the

"anthropause." In some areas, wildlife is reportedly making a comeback, afforded by the retraction of human activity, but in other areas, there are reports of increases in poaching, afforded by a reduction in tourism and enforcement (Buckley 2020).

Lest we be seduced by these click-worthy portrayals, Searle and Turnbull (2020) caution against narratives of "nature resurgence" (or Earth "healing" from the "scourge of humanity") as an inevitable consequence of a dialing back of human activity that obscures the concerted human and more-than-human labor required and reifies an imagined human-nature separation and the ephemeral nature of "quarantine 'ecologies of abandonment'" (p. 293). They invite us, instead, to consider "emergent ecologies" of resurgence as contingently coproduced by a multitude of human and more-than-human creative agents and that the COVID-19 pandemic has revealed the mutability of social-ecological relations/systems, a point to which we return below.

Indeed, COVID is far from a universal environmental success story. On the negative end of the balance sheet, the pandemic has also seen the suspension of recycling programs, plastic bag bans, reusable bags, and coffee cups, and the rollback of environmental approvals processes, in some jurisdictions (Zambrano-Monserrate et al. 2020). Fear of infection transmission has reduced public appetite for bulk food items, buffet, and unpackaged fresh produce and conversely has increased demand for prepackaged food items. This, coupled with the packaging associated with increased home delivery (via Amazon and other providers), not to mention the recommended use of masks and gloves, has increased the amount of medical (and civilian) waste associated with the upsurge in demand for personal protective equipment (PPE) (often in the form of single-use plastics) and other measures taken to combat the spread of infection in hospital, clinic, retail, and community settings (Klemeš et al. 2020). In many jurisdictions, the sudden increase in medical waste has exceeded local processing capacity (Saadat et al. 2020). This has prompted calls for the routine measurement of "Plastic Waste Footprint" for pandemic and other events, as well as advance planning for "disaster waste management" (Klemeš et al. 2020).

In short, COVID's environmental footprint is a mixed bag (pun intended) and one that will surely engender considerable additional research regarding, among other things, the resultant geographies of impact on both human and nonhuman.

4   Unequal Realities

No account of the pandemic is complete without an analysis of the starkly contrasting realities of how it plays out across the often-harsh divides of race, class, and gender. Public health authorities encouraging or requiring physical distancing and calling for nonessential workers to stay home were slow to recognize the white middle-class bias implicit in these edicts. "Essential workers," it turned out, included not just lionized health-care professionals but also a veritable army of primarily racialized, poorly paid, and precariously employed workers, laboring not only in

health care (as cleaners, personal care attendants, long-term care staff) but also in public transit, grocery stores, parcel delivery, waste management, and a host of other fields. These primarily racialized workers are more likely to be exposed at work, to have preexisting health conditions that increased their risk of severe complications from infection (Raifman and Raifman 2020), less capacity to refuse unsafe work conditions (precarious work with few benefits, job security, or options for paid leave), more crowded living conditions (enhanced risk of spread of contagion to other household members), and more reliance on public transportation (another site of exposure). They are also at higher risk of mental health impacts during the pandemic, it turns out (Jenkins et al. 2020).

That these inequities include access to green space, quality of the built environment (housing, working conditions, public transit), comes as no surprise to those well versed in the relationship between social and environmental justice. Racialized communities have long suffered the ignominy of more noxious facilities, fewer environmental "goods," and barriers to the kind of procedural justice that would enable redress (Agyeman 2005; Reed and George 2011; Taylor 2000). Indigenous communities are no stranger to pandemics (e.g., smallpox-decimated Indigenous peoples in North America and Australia) (Rallah-Baker 2020) and found themselves poorly equipped to follow public health guidelines (by virtue of the colonial legacies of overcrowded substandard housing, inadequate access to potable water). Some Indigenous communities erected blockages on highways into their communities to control access and keep the pandemic from striking their communities (Sinclair 2020).

These observations point to the need for theory-informed analyses of the unequal geographics of pandemic impact that exacerbates preexisting inequities and compound environmental injustice.

5 Peeling Back the Curtain: The Backstory

So-called natural disasters are rarely just about what nature is "doing to us" but also about the fertile ground left by decades of fiscal austerity and disinvestment in urban and public health infrastructure and rising inequality. The devastation wrought by Hurricane Katrina in New Orleans, for example, was as much about decades of loss of wetlands (and the storm surge protection they historically provided), racial discrimination and inequality, as well as human-induced climate change, deregulation, and government neglect and mismanagement, and poor management of the levees, as it was about a deadly force hurricane (Freudenburg et al. 2009).

As for the pandemic, Wallace et al. (2020) peel back the layers of "how humanity maneuvered itself into such a trap," nowhere more evident than in how the coronavirus has spiraled out of control in the USA, Brazil, India, and other countries firmly in the grip of neoliberalism and "laissez-faire" economics. A "relational geography" and political ecology of the pandemic show us how the threats we externalize as "out there" (e.g., the wet markets of Wuhan, China) are woven into an intricate

tapestry of global relations of trade, industrial agriculture, travel, and the "circuits of capital" that implicate global financial capitals of New York, London, and Hong Kong as much as Wuhan (ibid; see also Standring and Davies 2020). In a similar vein, some have argued for a renaming of the Anthropocene as Capitalocene (Moore 2017; Haraway 2015).

"Solutions" for addressing COVID, climate change, and the current sustainability crisis that has given rise to both of these are typically framed in technical terms. Many of the technological and technical "fixes" (including less conventional ones like permaculture) already exist and have been field-tested, leading some to suggest the real challenge is one of social and political will and/or entrenched (economic) self-interest (Poland et al. 2011; Hancock 2019). Few of the "solutions" being offered, even by One Health, address the root causes of these crises in the form of capitalism, globalization, economic growth imperatives, colonization, and neoliberalism. Deeper yet, Indigenous critiques finger settler-colonial logics of exploitation, which implicate individualism, dominant narratives of progress, and meritocracy, scarcity mentality, "survival of the fittest," and competition as the underlying root causes of our current predicament (Alfred and Corntassel 2005; Bakawa Country et al. 2016; Leonard 2020), leading to calls for Indigenous resistance and revitalization, not just reconciliation and decolonization (Alfred 1999; Fenelon and Hall 2008; Simpson 2017; Tuck and Yang 2012; Walter 2010). This goes well beyond calls for environmental management to be more inclusive of traditional ecological knowledge (TEK) (Nelson 2005). Further, only recently have calls for inclusion of posthumanist perspectives been heard regarding the relationships between the human and more-than-human highlighted by the pandemic (Blue and Rock 2020; Searle and Turnbull 2020).

6   A Fork in the Road

The pandemic had barely settled in, and a chorus of commentators were announcing that "this changes everything," that there would (or should) be no "return to normal" (Carr 2020; Haiven 2020). Many of us want to believe that the pandemic will auger a change of trajectory in favor of social and environmental justice. Yet we know that past crises, like the 2008 financial crisis and the calls for transformative change they engendered, resulted not in "pressing reset" on global capitalism but instead a hardening of austerities.

Some commentators have suggested that the pandemic is opening a giant "Overton Window" whereby policies that were previously inconceivable become widely accepted (Lent 2020). The pandemic response, at least in Canada, has given us a taste of what is possible when we are united, be it emergency housing for the homeless, income relief programs like CERB, or the release of prisoners serving time for nonviolent offences, ideas that we had been previously told were not "feasible."

The pandemic has breathed new life into (preexisting) calls for a "Green New Deal" and a "just transition" that puts clean/green energy and energy transition (including public transportation infrastructure) at the heart of post-pandemic stimulus spending, and that ensures that "green jobs" provide living wages for racialized and marginalized people who have been largely excluded from the emerging green economy (IISD 2020; Lent 2020; Hathaway 2020; Henry et al. 2020).

To the extent that the pandemic shone a spotlight on, and exacerbated, preexisting inequalities along racial, class, and gender divides, there is arguably broader recognition that a so-called "return to normal" is neither possible nor desirable. To put it bluntly, normal is killing us and the planet. Instead of "bouncing back," we need to "bounce forward" into new ways of thinking and doing, seizing the opportunity for deep and transformative structural reform that puts the well-being of the majority, and the planet, first. In our view (and we are not alone in this thinking), it must be predicated on coming into "right relationship" with each other, with Indigenous peoples, racialized and marginalized groups, other species and lifeforms, and the Earth which sustains us all. Risk management, the typical modus operandi of most public service and academic research and training, must ultimately give way to more transformative and systemic change that addresses the economic and cultural drivers of climate change, ecosystem degradation, industrial agriculture, rising inequalities, and human and ecosystem exploitation. This will require us to actively decolonize ourselves from the dominant Western paradigm of scarcity, meritocracy, competition, material wealth accumulation, narrowly cast narratives of "progress," and the supposedly questionable nature of human nature (see Bregman 2020 and Solnit 2009 for illuminating counterpoints on this latter aspect). Fortunately, other ways of seeing, being, and doing are available as alternatives, and social movements are active in this space (Poland et al. 2011). The centering of Indigenous, Global South, and other relational and animistic worldviews will be essential for this deeper work. May this be the real and lasting "silver lining" of the pandemic.

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Part III
Places

Chapter 29
Home in Context of COVID-19

Janine Wiles

Homes are key geographical sites. For most people, home is the physical location for a significant proportion of everyday life. Home is a key shaper and marker of sense of self and identity, wealth (or lack of it), well-being, and health. Home is a symbolic and emotionally imbued place and a locus of memories, a focus of aspirations, a place of (in)security. In the context of the COVID-19 pandemic, home has become simultaneously a safe shelter and a detention site. Most responses to the pandemic have implicitly relied on homes as resources for public health. Whether imposed by different levels of government or chosen by individuals and families, most responses have included some degree of restriction on movement and contact with others such as social distancing, shutdowns, quarantine, and full lockdown. As more people are thus restricted to their homes, the pandemic has highlighted the multidimensional and multifunctional nature of home.

Much more than a house, home is simultaneously a physical material space, networks of social relations, and webs of symbolic meaning. All of these shape and are shaped by each other and across time (past, present, and future) and space (including scales from intimate and local to international and global). Home is a facilitator of engagement with family and community and a place that engenders feelings of stability, safety, control, comfort, and sanctuary (Wiles et al. 2017). Homes are a combination (or assemblage) of feelings, ideas, memories, relationships, things, and activities that can exist at a variety of scales, from part of a house to a house, a neighborhood or community, even a country or region (Wiles and Andrews 2020). In the context of COVID-19, all of these elements of home are highlighted, and many experienced in new ways.

Initially, for those with risk of exposure, and more generally for entire populations, homes became physical "containers" in which to isolate and prevent ongoing

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transmission of COVID-19 infection. This containment to home has challenged and transformed understandings and experiences of home. For individuals at a personal level, this is evidenced by the explosion of memes about the frustrations of simultaneously working, learning, socializing, resting, recovering, and generally living while confined to a specific space with others. Collectively, the emphasis on home as strategy illuminated inequalities and inadequacies in housing quality, size, and density. Problems with home have been emphasized materially (homes that are too small or crowded), socially (gender- and age-related implications of the distribution of power or privilege and the work that happens at home, problems around violence and abuse at home), and symbolically (conceptualizations of home that are too narrowly defined such as home as belonging to a small nuclear family unit or a single person alone, houses as home). All of these have caused difficulties for those who do not "fit" these "norms" (e.g., larger households, nonkin households, multiple-generation households, carer households, and those in transient or inadequate housing or who are homeless).

Mass quarantine and social isolation sparked creativity and acceleration of ingenuity and distribution around ways for people to work and connect from home. Health providers developed new strategies and expanded existing platforms to enable remote consultations and evaluations. Some of these new ways of working are likely to stay around for some time to come. Government officials and experts found ways to connect with people in their homes through new and old media. For example, in New Zealand (NZ), where the Director General of Health achieved superstar celebrity status, the Chief Executive of Age Concern NZ said of his daily briefings on national television, "We were thankful that Dr Bloomfield came into older people's living rooms each day and provided a reassuring and knowledgeable voice in what was a time of distress for many" (Age Concern NZ 2020).

For many, work and schooling have moved home and online, making previously private parts of our homes very public in unprecedented ways. Teachers describe extraordinary glimpses into their students' home lives and understanding children in their contexts better. Many parents have gained a stronger sense of their childrens' learning, even if the frustration of managing to homeschool is also substantial. Working, learning, and socializing from home has also led to unprecedented levels of virtual or online connectivity. Telecommunications companies are beginning to highlight and emphasize the crucial role they play in supporting such connectivity and the value they create in allowing businesses large and small to thrive. There are attendant implications as they look to capitalize and extend this value and pass costs onto commercial and residential consumers.

Some have celebrated the opportunities and increased connectivity experienced at home during the COVID-19 pandemic. For example, some older people and people with challenges to mobility describe being "more" connected while at home than previously, as formal and informal organizations explore new ways of meeting and engaging "virtually" from home. At the same time, family and friends have more time to connect online. There are descriptions of family celebrations or organizational meetings which, although online, also include people who would not otherwise have had the time or ability to participate or families who used both

physical proximity and online connectivity to connect. Many report ongoing work and activity in clubs and groups via new online platforms or, for example, grandparents are reading to grandchildren online. Communities also came into homes, as communities rallied together and marshalled often limited resources to deliver material and social support to those in need, whether in the form of food parcels or mitigation of family harm incidents (e.g., see Kai Collective 2020). Many groups were able to connect with food distribution networks to redirect food and other resources to the homes of those in need.

"Third spaces" are the not-private, not-public spaces where fleeting, "casual" interactions take place, which are nevertheless vitally important to social connection (Finlay et al. 2019). Many indoor third spaces, such as coffee shops, gyms and pools, libraries, and malls (and even public transport spaces such as bus stops and the carriages and interiors of trains and buses) have been closed or restricted in terms of operating and may struggle to be viable long term. These closures have implications for those for whom these are valuable spaces for social interaction and physical activity and resources (such as caregivers based at home, older people, transient or homeless people). On the other hand, outdoor parks and footpaths (or sidewalks) are also third spaces and have become important sites for distanced interaction. For example, under Level 4 lockdown in New Zealand, roads were empty of cars and were quickly reappropriated as new "third spaces" filled with cyclists who would otherwise not use roads (like families with children) and other activities, with an almost festive atmosphere in many neighborhoods. In other places, there are reports of roads being closed to have dining in the streets (Laris 2020). Globally, there has been a (re)surgence of activity around active modes of transport, and marking out more spaces in particular for cycling, although cars and variations on drive-throughs have also become an extension of the "bubble" of home and a means for many people to move about while safely distancing from others.

Thus, the move to home and great online connectivity is important because it has enhanced connectivity and reduced barriers around challenges to mobility for a range of people. Golant (2019) has recently argued that as there is an expansion in delivery of information, goods, activities, service, and care to home dwellings via internet connectivity, e-commerce, social media, smart homes, telemedicine, and robotic technologies, those with mobility limitations will be less constrained and able to be more self-reliant. These may be less available, however, to those unable to afford or negotiate acceptable access to them, particularly those with lower incomes, who are physically and mentally frail, and/or who are concerned about threats to privacy and control of their decisions.

Increased connectivity at home for some thus highlights and further amplifies existing inequalities and inequities. These include inequities in terms of access not just to Internet connectivity (absolute access, dial-up vs. broadband, prepay vs. plans, and quality and speed of connectivity) but also to devices within the home (where limited devices for accessing the Internet may mean inequities within households in terms of who has access to online). Even in the "developed" world, more than 13% of the population does not access the Internet (in the "developing" world, more than half the population have no access although numbers accessing the

Internet are growing) (Clement 2020). Lack of access disproportionately affects women, older people, and other minoritized groups.

Others describe increased isolation being at home, whether living alone or within households of busy people, and there are significant fears about the impact of this on people's health. For those already receiving and giving care and support at home, COVID-19 has created additional challenges. Care work at home is often less visible to both social networks and formal health systems alike (Wiles 2003, 2005), and for many caregivers, this is exacerbated in quarantine or lockdown conditions. Caregivers and recipients have been very isolated at home, especially without ability to get respite support. Service and support workers coming as home help and personal care have also been an issue, with limitations or restrictions on personal protective care and home care workers often at the bottom of the priority list to receive this gear. These limitations create concern and anxiety for workers and care recipients alike about potential risks of transmission. For those who are particularly at risk to COVID-19, this may mean reduced care or no care coming into the home at all. For many, new forms of connecting with health and other services, such as navigating online consultations, added additional pressure. Problems with global supply chains have led to medication shortages and anxiety. In some areas, deaths from COVID that happened at home or not in hospitals were not counted in tallies measuring the impact of the pandemic.

Homes themselves have also become markers of inequities. Lack of density and good-quality homes marks out privilege, which stands in contrast to those in high-density housing or crowded homes who have suffered the difficulties of social distancing more in terms of restriction and are at greater risk for transmission. For many, home has become the site of distress as many more households struggle to meet first-order needs for food and shelter. There have been increases in home-based violence and abuse. As the disruptive economic impacts of the pandemic have extended, we have seen the development of groups of "new poor" becoming under- or unemployed, with attendant effects on paying rents or mortgages. Many people are losing their homes as a result.

Feelings and experiences of home in the context of the COVID-19 pandemic and response have been mixed. While some have rediscovered the joy of home and experienced high levels of socially distanced support and contact with others in the context of lockdown, the pandemic also highlights the inequities associated with housing and home. Quarantine exacerbates loneliness and isolation for some and intensifies problems with abuse and conflict. It also highlights inequities between and within homes. The pandemic has dramatically accelerated and transformed the connectivity of homes in terms of online services and delivery, new ways of working and learning from home, and socializing and interacting otherwise. The uncertainties and hardships associated with the pandemic and its aftermath are particularly acute in the home, where procuring the basics of survival (food, shelter, warmth) becomes the prevailing focus for many.

Future research should include a focus on inequities in housing and how these contribute to or protect from COVID-19 transmission and how this could be better managed in future pandemics. Other relevant topics might include the experiences

of people working from home and particularly Internet connectivity across and between different places. With the strong focus on social connectedness and mitigating isolation and loneliness, it would be useful to better understand ways in which people have been able to maintain social connectivity despite restrictions around home and ways to protect the mental well-being of those confined to home in the context of risk or lockdown legislation. In terms of health and home, it will be essential to understand the experiences of people providing and receiving care at home in the context of pandemics and restrictions and how to optimize their well-being in these contexts.

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Chapter 30
Death, Devastation, and Failure in Long-Term Care: The Need for a Geographical Reengagement with the Sector

David R. Phillips and Gavin J. Andrews

1 Introduction

The study of long-term care (LTC) environments for older people (commonly known as residential, old age, or nursing homes) is a long-standing concern of the geography of aging/geographical gerontology. Growing in the mid-1980s, research has focused on diverse issues across numerous regional and national contexts including distributive patterns in provision; policy, regulation and financing; planning regulations and dilemmas; building design and use; referral and access routes; clients, care needs, care processes and homelife; and ownership, management, workers and staff (Andrews et al. 2005; Andrews and Phillips 2002; Cheng et al. 2011; Corden 1992; Falk et al. 2009; Ford and Smith 1995, 2008; Hamnett and Mullings 1992a, b; Harrop and Grundy 1991; Joseph and Chalmers 1996; Peace et al. 1997; Phillips et al. 1987; Phillips and Vincent 1986, 1988; Reed et al. 1998; Smith and Ford 1998). As the dates of these key references show, the production of research in this field has waned somewhat in the past decade; the once thriving field has stagnated, and LTC has been rather neglected by geographers. To speculate, this might be because of the emergence of home as a preferred and prioritized site of care for older people (often under the ethos of "aging-in-place" and aging in the *right* place) or perhaps due to a period of relative stability or even neglect in policies

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toward LTC provision across many jurisdictions. Whatever the reasons, LTC environments remain a crucial part of the caring landscape and show no signs of disappearing from it. Critically, as an academic situation, this recent neglect of LTC by geographers is unfortunate in view of developments this decade and the catastrophe that COVID-19 has meant for many LTC environments, the older people resident in them, and their families and care staff. Indeed, examining the crisis, we argue that this is more than sufficient justification for geographers to refocus current research onto LTC and make it a priority for the discipline, incorporating many of the theories, frameworks and methods at their disposal.

2 COVID-19 and LTC

Older persons have been identified globally as at risk from most infectious conditions which has been starkly emphasised by COVID-19. Many jurisdictions have required forms of segregation, isolation and safeguarding for older persons in the pandemic. Nevertheless, the exceptionally high mortality incidence in many LTC settings has been both surprising and alarming. Data suggest that, by early 2021, LTC deaths due to COVID-19, as a percentage of all deaths due to COVID-19, were 34% (UK), 48% (Spain), 64% (Ireland, 2020), 75% (Australia), 39% (USA), and 59% (Canada); some of these percentages were even higher in mid-2020 (Paulin 2020; Comas-Herrera et al. 2020/21; Suárez-González et al. 2020). Even acknowledging international reporting inconsistences—and undoubted underreporting among deaths of older persons with multimorbidities—this is a considerable "excess" mortality above the "expected" mortality among older people for their health status. The media and academics have predominantly referred to an ongoing "crisis" in LTC, rather an understatement in the light of these deaths and their impacts (arguably, more of a "humanitarian crisis" has occurred). There have been relatively few positive stories internationally: Hong Kong, Singapore, Korea, New Zealand and Japan, for example, initially reported low COVID-19-related morbidity in LTC. While this may change, it does suggest that disaster is not necessarily universal or inevitable (Comas-Herrera et al. 2020/21; Lum et al. 2020). Moreover, emerging patterns suggest that the share of deaths in LTC seems to stabilize in counties over time although it is not yet clear if the subsequent waves of COVID-19 infection will lead to a reduction or increase in that share of mortality (Comas-Herrera et al. 2020/21). Early indications in 2021 suggest that some if not all vaccines are efficient among older populations and may help ease mortaity in LTC settings, but efficient and equitable distribution of them will be key.

Behind and beyond these figures are many complex situations in terms of causes, impacts, blames, and responses that vary not only from country to country but very often within countries. Nevertheless, the following developments in Canada and the United Kingdom (UK) provide some insight into the diverse picture. A consensus seems to be that the crisis in Canada stemmed, in part, from early directives for people with confirmed COVID-19 to remain in LTC rather than be transferred to

hospital: LTC environments that were ill-equipped to provide intensive curative medical care for them and to prevent the further spread of the disease through infection control. Meanwhile, there is some agreement that, in the UK, the crisis stemmed in part from decisions to discharge thousands of untested older hospital patients into LTC environments, importing COVID-19 with them. Again, these were often LTC environments that were ill-equipped to provide appropriate medical care and prevent further spread. The outcomes in both counties were similar; LTC environments were left to cope alone lacking sufficient medical equipment (especially ventilators), personal protective equipment (including gowns, shields, and gloves), infection protocols and training (such as adjustments to interpersonal care, routines, and homelife), and safety infrastructure (such as negative pressure rooms and areas). A more general problem in both counties was that many care workers frequently worked in more than one institution/setting, posing a risk for transmission. This practice was quickly curtailed in both countries but, in turn, led to staff shortages compounded by other staff leaving the sector due to the dangers COVID-19 posed for them (coupled with deaths, a situation that resulted in the deployment of over 1700 members of the Canadian armed forces into Quebec and Ontario LTC environments).

Even for residents of LTC who have remained well and free of COVID-19, life has changed dramatically during the pandemic. Family visits, outside trips/activities, and incoming entertainment and therapies have generally been reduced, restricted, or completely prohibited. Indeed, some residents have not seen their loved ones in months or longer, and many have died from COVID-19 or from other causes without family and loved ones at their side. Impacts on local communities have also been notable, particularly in smaller towns. One example is the town of Bobcaygeon in Ontario (population 3,500, located about 90 min northeast of Toronto). The deaths of 29 residents in one LTC home "Pinecrest" was well-publicized, half of all residents there and a good part of the oldest generation of the town's population. In a show of community strength and unity, the town's people organized walks/drives and art-based activities, raising over $200,000 for a relief fund. This aims to purchase safety equipment; assist workers, seniors, and families in need; and provide grief counselling and therapy and other supports.

Recriminations and blame for deaths in LTC have been bitter and widespread in many places. A trend has been for the British to initially blame politicians and Canadians to initially blame institutions and management. These differences could reflect national cultures or be down to differences in actual responsibility. At a structural level, they could reflect the nature of the LTC sector; Canada's being more corporate, and the UK's more of a dispersed, almost cottage industry. However, in effect, most blame has eventually indicted central governments for poor regulation, quality standards, and funding in LTC. Webster (2021) notes that COVID-19 has highlighted the crisis in Canada's care homes and low quality of care especially in for-profit privately owned homes. Notably, many class action lawsuits have been initiated against operators and various levels of government in both countries. The causes, impacts, blame, and responses in LTC in many counties are now the topic of an emerging social and health science literature focused on diverse issues including

epidemiological and clinical characteristics (Graham et al. 2020; McMichael et al. 2020; Rawle et al. 2020); risk factors in death (Fisman et al. 2020; Gardner et al. 2020; He et al. 2020; Stall et al. 2020); limitations and changes in infection control, staffing, and practice (D'Adamo et al. 2020; Gardner et al. 2020; Gorges and Konetzka 2020; Hsu et al. 2020; McMichael 2020); and overall political and policy causes and solutions (Chen et al. 2020; Daly 2020). Also, very usefully, much information is compiled in the International LTC Policy Network's "LTC responses to Covid-19" analyses, reports, and resources, coordinated at the LSE (https://ltccovid.org/). The widespread crisis has led to calls in many countries for the reform of LTC, ranging from minor changes to the complete overhaul of current systems and practices (such as arguing for universal public systems as a way to increase regulation and safety). Only time will tell what happens to specific systems and how much authorities, professions, and societies are willing to learn from the tragedy.

3 Research Challenges in a Varied Sector Internationally

Prior to specifying a future research agenda, we should note that there are inherent challenges (1) in studying LTC and (2) in creating an international literature on the sector. With regard to the former, while access to LTC environments is always challenging—oftentimes due to fragmented, cautious, conservative ownership and management and needs to maintain clients' privacy—access has been made yet more challenging given the dangers of COVID-19, infection control and likely future variants of this and other viruses. With regard to reviewing the international literature, the subject (LTC) is not consistently defined internationally, which makes academic and policy conversations and comparisons difficult. LTC is very different in different countries in terms of ownership, size and client needs and profiles, and levels of social care vs. health care provided. Internationally, LTC ranges from large corporate-owned, hotel-like or hospital-like institutions with hundreds of residents to small units/homes accommodating just a few people, owned and run as individual family businesses and regarded as part of local communities. Moreover, financing, funding, regulation, standards, and oversight range considerably among countries and localities. Also recognized is that different countries report very different percentages of older populations residing in LTC and hence there are very different scales of, and reliance on, the sector. For example, the OECD (2019) report that while more than one in five people aged 65+ are in LTC in Switzerland (22%) and Israel (20%), fewer than 5% are so in Poland (1%), Portugal (2%), Ireland (3%), the Slovak Republic (4%), and Canada (4%). In many low and middle-income countries, data on LTC is scant and the sector goes largely unrecognised and unregulated. These differences and circumstances in LTC have to be acknowledged in future as we move forward in researching the sector. Nevertheless, there are some general international expectations. The WHO and OECD, for example, optimistically consider that LTC systems might "'enable older people, who experience significant

declines in capacity, to receive the care and support of others consistent with their basic rights, fundamental freedoms and human dignity" (WHO 2020).

4 Aligning Future Research Questions and Approaches with the Key Challenges for the Sector

Even with increases in aging-in-place policy and practice, LTC is likely to remain an inevitable and integral form of accommodation and care for older persons given the aging populations and broad societal trends toward reduced family size, ties, and caring responsibilities. Indeed, there even seems to be a general upward trend in percentages of older people residing in LTC internationally as the "oldest old" population increases. This does not mean LTC has to be poor or substandard or, in the case of COVID-19, dangerous. For example, WHO (2020) notes that LTC systems can provide good quality care, reduce inappropriate use of acute or formal healthcare services, and help families avoid catastrophic care expenditures. Crucially, LTC (via short respite care and in the long term) can relieve "caregiver burden" and release women—who are often the main caregivers—to pursue other forms of social and economic participation. In this context, we argue that a good way for geographers and others to reengage with LTC in the future in the wake on COVID-19 and help create a safer and better future is, as Donna Haraway might put it, to "stay with the trouble"; to not only dissect the past and the causes of failures in LTC to protect most vulnerable people from COVID-19, but also to align their research with the future challenges and changes the sector faces. This clearly means that there are many potential areas of interest which we pose as questions:

- What is the current unmet need and/or future projected need for LTC, and what are particular access issues in different national and local contexts? What forms of provision, building design, and regulation/inspection will help these needs to be met safely? What obstacles have to be overcome along the way, for example, in terms of building and equipping facilities, appropriately qualifying workers, and setting up regulatory systems?
- How might homelife and safety be improved, first via national policies and systems and second via practice and procedural changes within settings themselves? What are the roles of staff mix, staff specialist training (e.g., in use of personal protection equipment, infection control procedures), resident density, particular shared and private spaces, access by visitors, virus testing requirements, and specific situational protocols and responses? How can special needs and challenges be addressed that are often posed by a client group, some of whom have cognitive decline and who may not always comply with rules yet still need to be kept safe?
- How can relationships, communications, and procedures be addressed to minimize infection and improve safety? On one level, this might be between TLC and other sectors such as primary care, hospital/secondary care, social work, home care, and private suppliers of technology and equipment. On another level, it

might also be between different levels of government (e.g., in the USA, federal to state; in Canada, federal to province; in the UK, Westminster to county council). Finally, this might be between LTC providers and families, communities, and the public generally.

- How might LTC become a sector and form of care that is less marginal both in terms of how it is viewed and perceived (image/meaning) and in how it is measured (through deficiencies in training, equipment, pay, and other resourcing)? De-marginalizing the sector and the settings that comprise LTC might pay dividends in terms of providing safe, good quality, and positive experiences for older people and workers.
- How can the human rights and dignity of older people living in LTC be preserved to ensure they are not discriminated against solely because of their age and place of residence (eg avoiding unfair and extreme isolation and lockdown measures)?
- What kinds of geographical approaches, theory, methods, knowledge translation, and public/activist strategies can we deploy to address these areas and questions? What access and ethical issues arise, and how might they be tackled? What geographical subdisciplines might provide expertise and knowledge, for example, social geography, health geography, economic geography, urban geography, development studies, and so on? How might geographers work with scholars from other academic disciplines and nonacademic colleagues towards common improvement goals?

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Chapter 31
Refiguring Public Spaces?

Paul Simpson

1   Introduction

Public spaces hold a complex and contested status in contemporary life. Spaces such as parks and squares are often held up as sites of possible sociality and expression where people can congregate with others, be seen, and be heard (Ruppert 2006). At the same time, such spaces are also seen by some to be sites of potential fear and incivility (Amin 2006). The very status of such spaces as public has come to be at risk from increasing privatization and policing pursued in the interest of specific segments of "the public." This unfolds through the ever advancing and ubiquitous technological monitoring of individuals and their actions (Amoore 2013). This chapter reflects on the status of public spaces emerging from within the COVID-19 pandemic. It questions the extent to which the pandemic will represent a shift or refiguring of the terms of such debate over public space or simply be an event through which long-standing concerns are locked down and taken further.

2   Locking Down Public Spaces

A common feature of the varied COVID-19 responses across the world has been that restrictions have been placed on the use of public spaces. In an effort to reduce the spread of the disease, various limits have been placed on individuals' movements into and through public spaces. This has ranged from full lockdown measures entirely limiting individuals' movements outside of private property, to allowing

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individuals to go out to provide essential services or meet essential needs (i.e., shopping for food), to allowing members of the public to engage in certain permissible recreational uses of public space, potentially for a set number of times and length of time. At the same time, restrictions have been placed on the extent to which this can involve assembly. Limits have been placed on who (if anyone) can be met, where they can be met, how many can meet, at what proximity interactions can happen, and so on. Depending on national guidance, certain protections may be in place, with rigorous and regular handwashing most common, but also the use of hand sanitizers and/or the wearing of masks depending on the specific space being used. Given the varied rate, timing, extent, and knowledge of the spread of the virus, such restrictions continue to unfold and be revised with a varied and varying geography.

Alongside such restrictions on the use of public spaces during the pandemic, there have also been a range of accounts of rule breaking that have circulated through mainstream and social media. The term "Covidiot" was coined early on to describe individuals who, for example, fail to adhere to basic social distancing guidelines. What in the recent past might have been symbols of conviviality and sociality—hugs, handshakes, and so on—became stigmatized gestures. Further, what would normally be innocuous scenes in the UK—prone sunbathers in public parks—circulated and were debated widely. Later, images of crowded beauty spots in rural parkland areas, busy beaches, and bustling open-air markets came into concerned view. VE day brought scenes of illicit and impromptu street-party commemorations that circulated ambiguously in the press, the sentiment (and suggested, if not rigorous, social distancing) seemingly making it "okay" to report without judgment. Tales of a prominent political adviser driving blindly to a Durham castle came to be debated at length.

From these scenes and stories, collective feelings of outrage and condemnation have come to be felt among geographically distributed yet enclosed populations and "the majority" public who are adhering to the rules that have been outlined for them. In turn, such feelings have been given validation when rule breakers are presented by governments and the media as exceptions. Big data tracking movements are used to show that most are moving out into the world much less, both in distance and frequency. Strikingly lifeless images of normally bustling squares and streets accompany such commentaries, reinforcing the message of collective participation and sacrifice.

While perhaps more extensive and severe in measure, and in turn more palpable in how those measures have come to be felt, in some senses, the tensions outlined above in the restrictions placed on access to public space, in what can be done in them, in who is doing what, and in the judgment of certain uses or users of said spaces is nothing especially new. The extent to which such spaces are really open to the public or who "the public" really is have been debated for some time. Equally, thinking about the material character of public spaces and their design moving into the future, the extent to which this will move beyond already well-established concerns for "healthy," sanitary, and/or sanitized spaces can be questioned (see Honey-Roses et al. 2020). While a lot has changed in the rapid and ongoing unfolding of this global pandemic, public spaces have arguably seen the extension of a host of

trends that were already well established. We have a differentiated public, restrictions on access and conduct, monitoring and policing of "the public," the identification and stigmatization of certain individuals who do not adhere to the rules, and so on.

3   Refiguring Public Spaces?

To understand the current efforts to stall the spread of COVID-19 through the limitations placed on individuals' use and presence in public space, I am going to turn to ideas of immunity and reflections on the pervasive immunitary apparatus that arguably already operates across a host of realms of contemporary society (Esposito 2011). This provides a useful means of seeing how the current lockdown policies for public space are less a rupture in the ongoing evolution of public spaces and more a part of a longer genealogy of urban living.

While commonplace conceptions of contemporary public space have their origins in the nineteenth century where pavements/sidewalks were for wandering, for browsing shop windows, and for seeing and being seen—recall Benjamin's well-known accounts of various figures of public life like the Dandy, the Flaneur, and so on (Benjamin 2003)—we have for some time been living in the midst of an unfolding "immunitary" agenda. Immunitary here refers to "a protective response in the face of risk" from an external threat that presses up against the body both of individual and "the people" which is orientated toward the protection of such bodies from various forms of intrusion (Esposito 2011, p. 1). Relevant to our current circumstances, it is not hard to see this, for example, in a host of public health agendas and in the management of waste in urban spaces or in a range of urban planning responses to various past infections, outbreaks, or diseases that precipitated those efforts. Esposito (2011, p. 2) suggests that:

the risk has to do with trespassing or violating borders. Whether the danger that lies in wait is a disease threatening the individual body, a violent intrusion into the body politic, or a deviant message entering the body electronic, what remains constant is the place where the threat is located, always on the border between the inside and the outside, between self and other, the individual and the common. Someone or something penetrates a body – individual or collective – and alters it, transforms it, corrupts it.

As part of this troublesome breaching of borders, much of contemporary thinking around the public and public space takes the form of an extensive "immunitary apparatus" that seeks to sure-up the individual by excluding any troubling alterity and protecting "us" from our exposure to (human or nonhuman) alterity. That which is different to "us" is excluded or kept apart.

More specifically, such immunization unfolds in three parts: it is a reaction to a threat, it entails selective inclusion, and it is structurally aporetic. In this, we perceive a threat—an other who is different to us, an activity that is concerning to the majority, and a use that does not fit within our preconceptions of order and

appropriateness. In our current pandemic, an individual is infected with an unperceivable threat. From this, we draw up ideas on who is or isn't included, who is or isn't appropriate to a situation, who is or isn't really a part of the public, and what is appropriate action and what is not. In our current pandemic, we have social distancing and limits placed on who we can interact with. So-called "Covidiots," for example, are singled out and distinguished from the adhering public. And with that, we end up in a situation where "the public" or what is "public" is not actually so as they do not include everyone. Rather, we have a segmented, exclusionary, hierarchical sketch of anything deserving of such a title. In our current situation, we end up in socially distanced spaces which are not equally open to the public and in which all individuals cannot assemble freely.

This reading is not to say the temporary restrictions placed on individuals' engagements with public space are unjustified as some protesters are currently arguing in various public spaces around the world. Rather, it is to say that while the various regulations currently in place across the world might *appear* exceptional, they are not necessarily new. And from that, the question of what sort of actual return or repeal in these will take place in the future emerges as fundamental.

4   Blank Futures

Where does this immunitary reading of our lockdown situation leave us in terms of thinking about the futures of public space in/after COVID-19? What sort of issues or opportunities might present themselves?

Writing from the midst of partial lockdown and somewhere shortly after the (first) peak of the pandemic (in the UK at least), it is simply not possible to make definite claims on the future of public space, on what specific agendas and issues might emerge, or on what possibilities (for better or worse) might present themselves. What does seem to be clear, though, is that a range of long-standing questions—over policing, securitization, and their technological extension; over incivility and inequality; over individualism and aberrant behavior—will rumble on and potentially come into sharper and sharper focus.

In this sense, I have found it helpful to think of the future of public space as a blank. This is not to say that the slate has somehow been wiped clean by the pandemic and that some kind of entirely new future possibility—be it utopian or dystopian—might emerge. Rather, I'm using "blank" in the sense offered by Michel Serres (1991, p. 93 [emphasis added]) names "blank":

"a sort of neutral or, rather, multivalent element, undetermined by itself, that can take on any value, identity, or determination, *depending on the surrounding system that it finds itself inserted in*. … Like the chameleon, they are determined by their surroundings. Or by an external determination. Or by the ensemble in which they are put into play."

Important here is the two-sided nature of this blankness. It is potentially a source of both continuity and difference.

On the latter, there is a "motility" to the blank, meaning that it is "able to disregard the homogeneity of social order…and recognise instead the possibilities of order arising from the connections between heterogeneous elements that can be other to these categorisations" (Hetherington and Lee 2000, p. 176). It might be the case, for example, that private car use partly gives way to increased pedestrianization and provision for more active modes of travel; that pavements/sidewalks become more expansive to allow for a more socially distanced public; that increasing amounts of small-scale public park provision is installed throughout cities, affording access to more diverse visions of the public; and so on. It might be that there are changes in the sorts of sociability and incivility that have been suggested to characterize public spaces and that a collective sentiment of "being in this together" or some equally shared challenging encounter reshapes individuals' dispositions toward others, both similar and once thought different to them. We might find ourselves in a situation where the pursuit of immunity leads to a sort of affirmative response, allowing "the individual to open up to what is threatening to him or her in order to alleviate the grip that one's own self-protection has over the individual" so that "we may live in common, not thanks to homogeneity but because of our distinction and diversity" (Lemm 2013, p. 6, 9).

But that might all be a bit too optimistic. The blankness of future public space might equally mean that other already existing pervasive interests are met and that the "surrounding system" that Serres identifies—one which Esposito would term an immunitary thanatopolitics—continues to advance its interests apace through these spaces. It might be that greater degrees of policing and conduct management unfold; it might be that there is far less opportunity for public assembly, and we lose access to the much of physical public sphere that public spaces can present; it might be that our movements in such space become monitored with ever-invasive technological interventions legitimated by their primary use in "track-and-trace" virus management; and it might mean that those who don't belong or fit into "the public" find themselves even more marginalized, unable to make do in their already socially distant circumstances or sustain themselves through already precarious informal economies. We find ourselves moving further toward a herd immunity less focused on an ability to fight off infection and more orientated the protection of the individual and "the public" from what lies at their outside.

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Chapter 32
Consumer Spaces

Alex Hughes

1 Geographies of Consumption and the COVID-19 Crisis

The COVID-19 pandemic is powerfully transforming the spaces through which goods and services are consumed across the globe. The closure of high street stores; the queues for supermarkets, pharmacies, and independent stores; the increasing shift of more and more purchasing online; and the efforts of state departments and charitable organizations to provide food for the vulnerable are some of the notable features of a pandemic that has had profound effects not only on health and health-care but also on the economy and other aspects of everyday life. The contrasting implications of the crisis for different sectors of the economy and their associated spaces of consumption, from textiles to hospitality, represent important subjects of policy-orientated and academic research as the pandemic and its economic consequences unfold. In this chapter, I reflect on consumer spaces for food as an emblematic commodity entangled in the crisis. Geographical perspectives on consumption, which have been part of interdisciplinary research for several decades, offer lenses through which to view the many challenges that COVID-19 presents to food distribution and use. They can also be applied to envision more progressive and sustainable food consumption during and beyond the crisis.

The embeddedness of consumption in ordinary practices of everyday life has been an important focus of geographical research over the past twenty years. Following early work in the 1980s and 1990s on landscapes of consumption such as malls and theme parks, studies have since engaged with more mundane spaces, including food markets, grocery stores, and the home, and have interrogated the frugal and ethical dimensions of consumption as well as critiquing "the

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aspirational" (Lane and Mansvelt 2020). Influences of the state, business, and civil society on food purchasing and use, including issues of safety, quality, and lifestyle, are addressed in the literature alongside the agency of consumers themselves (Chen et al. 2019). Recent work on sustainable food consumption has followed social practice theory to emphasize the significance of routinized and habitual practices of ordinary life in (re)producing patterns of food purchasing, use, and disposal (Evans 2019; Lane and Mansvelt 2020). However, other research has embraced the ways in which consumers very consciously balance considerations of cost, care, convenience, quality, and ethics when purchasing food and incorporating it into their daily lives (Meah and Jackson 2017).

Prior to the COVID-19 crisis, Evans (2019) called for studies of sustainable consumption to challenge dominant narratives on the significance of habitual and routinized practices; to reconnect with cultural dimensions of consumer agency, whether they are injected with materialistic aspirations or moral concerns; and to grasp their environmental and social effects. As the pandemic so profoundly ruptures established routines of shopping, cooking, and eating, and presents a shock to food systems globally, it would seem apt to take Evans' (2019) cue. Geographical perspectives on consumer culture have potential to critically grasp the shifting landscapes of food consumption through the pandemic, from the implications of lockdown and restrictions on mobility for food supply to the changes in everyday shopping and cooking practices that for many have become more time-consuming, far from routine and can be shot through with anxiety. They can also contribute to an agenda—called for by many on the Left—for creating more sustainable spaces of consumption beyond the pandemic.

2   COVID-19 and the Changing Spaces of Food Retail and Consumption

Evans (2019) has followed the work of Alan Warde in defining the key elements of consumption practice as acquisition, appropriation and appreciation, adding devaluation, divestment and disposal to capture waste, reuse, and recycling. The pandemic and periods of lockdown have challenged the food systems in which all of these components of consumption are embedded—disrupting flows of goods; reconfiguring the spaces through which food is purchased and eaten; widening inequalities in access to food; and altering material culture.

Considering food acquisition and access, the first lockdowns and restrictions on mobility early in 2020 immediately tore through spaces of food consumption as we knew them. A significant effect was the closure of establishments for eating out—restaurants, bars, cafes, fast-food outlets, and markets—that had experienced such rapid growth globally over the past 20 years and the closure of schools where so many children had been catered for during the daytime. Goddard (2020) quantifies the significance of these closures for Canada, for example, explaining that 30% of

national expenditure on food prior to the crisis had involved purchases through this food service sector. That spend effectively shifted overnight to supermarkets, independent grocers, and outdoor markets permitted to remain open in some countries. This sent shock waves through retailers' just-in-time distribution systems, which initially struggled to cope (Goddard 2020; Power et al. 2020; Richards and Rickard 2020). In the UK, there was a £524 million rise in expenditure on groceries for April compared with the same month in the previous year, including an increase of almost 40% in sales through convenience stores (Wood 2020). Reports in the media proliferated with images and stories of panic buying, stockpiling, and empty shelves. However, the issue was not only one of significant anxiety on the part of consumers but also resulted from the lag times in retailers' distribution systems and production networks adapting to the shift in demand.

Another effect of the pandemic, lockdowns, and restrictions on mobility has been the increasing move of purchasing online and the associated rise in food delivery. In Canada, when the COVID-19 crisis took a hold in March, online purchases increased from 1.5% to more than 9% of all national grocery sales (Richards and Rickard 2020). A comparable figure of 10.2% was reported by Kantar for the UK in April, with those over the age of 65 reported to be the demographic group with the greatest increase, which was supported by retailers' systems for granting priority access to those least able to shop in stores (Wood 2020). Independent stores and food market vendors have made similar adjustments to delivery and online sales using platforms where they can, with Preiss (2020) noting the economic importance of this in Brazil where the market vendors rather than supermarket chains purchase produce from small, local producers. For consumers purchasing food in stores, the experience during the pandemic has dramatically altered with the introduction of one-way systems, physical distancing, and protective shields and equipment. The longer time periods required to shop have resulted in the resurgence of the weekly supermarket shop in the UK, swiftly breaking from a precrisis trend in more regular and smaller food shopping trips (Wood 2020). At the time of writing, commentators predict continued momentum in online purchasing.

The pandemic has also prompted significant change in practices of appropriating and appreciating food beyond the act of purchase, as well as shifts in disposal. Practices of unpacking, storing, and cooking food now include rigorous procedures of cleaning and careful planning regarding the timing and location of storage as consumers manage the risk of viral transmission in their everyday household routines. The planning of meals, in particular during initial phases of lockdown when food supplies were uncertain, has also demanded additional time and care. Regarding the appreciation and valuing of food, the lockdowns, restrictions on mobility, and the limits to the operations of the food service sector, even through phases of reopening, have been responsible for changes in cultures of consumption, including more shared meals in households, more cooking from scratch, and shared meals online with family and friends (Smithers 2020). Where eating out and shared meals between households are permitted, there are physical distancing restrictions in place and encouragement to avoid communal eating involving shared plates and utensils. Authorities in China, for example, have run campaigns to urge consumers to use

designated utensils for each dish and to avoid sharing platters (Kuo 2020). There have also been reports of greater frugality and reductions in household food waste (Smithers 2020), illustrating how practices of food disposal are also changing during the crisis. This is important in the context of goals to decrease high levels of food waste. In the UK in 2019, for example, food waste created by households and the food service and hospitality sector together represented 16–18% of food purchased (WRAP 2020).

3   Spaces of Food Consumption Beyond the Pandemic

There is fierce debate about the future of food systems, including spaces of consumption, as the pandemic continues, and also beyond it. Growing inequalities in access to food and food insecurity at local, national, and global scales demand urgent policy attention. In the Global North, for example, Power et al. (2020) note the likely increase in the proportion of the UK population who are food insecure (13% precrisis, including those who are marginally affected) due to rising unemployment and growing numbers of those who are vulnerable for health reasons. Many of the growing middle classes in rising power and emerging market economies are now in more precarious economic positions as a result of the crisis, with implications for patterns of food consumption (Dahir 2020). In the Global South, the current and potential problems of food insecurity aggravated by the pandemic are catastrophic, with Mukiibi (2020) commenting on the early challenges of emergency food relief programs across the African continent and calling for programs of alternative food networks tied to local modes of production rather than being reliant on imported food.

It is imperative that the more resilient food systems being called for, designed to withstand future shocks, are also sustainable environmentally and are not economically exploitative. Spaces of consumption play a vital role. Consumption practices of food acquisition tied to more diverse supply chains that are not over-reliant on imported food and which involve procurement of food from small producers are one part of this (Blay-Palmer et al. 2020; Mukiibi 2020; Preiss 2020). The support of consumers for independent retailers is another. More careful planning of shopping and meals that reduces food waste from the home, observed during the crisis, is another dimension of a more sustainable food system. However, there are challenges posed by the shift toward more online consumer spaces, which although accessible to small-scale traders, favor "big capital" retailers with the technological capacity and infrastructure to choreograph the food supply chain (Richards and Rickard 2020). As online purchasing continues, and potentially increases, research is required to understand consumers' lived experiences of navigating both virtual and physical retail spaces, and the social and environmental consequences of this. Such research needs to be responsive to the effects of the pandemic on changing corporate retail structures, the balance between the food service and grocery retail sectors, and the changing rhythms and spaces of working lives.

Any debate about the future of food systems taking lessons from the pandemic must take seriously the spaces and practices of consumption. The ruptures in the rhythms of everyday food consumption caused by the pandemic present an opportunity to experience and envision how sustainable food consumption might be practiced in ways that have more positive socioeconomic and environmental effects. Understanding the embodied and often emotionally charged practices of food appropriation, appreciation, and disposal through the pandemic is crucial to this endeavor. Following Meah and Jackson's (2017) observations about the ways in which consumers continually weigh up multiple considerations of care, convenience, cost, ethics, and quality, research is needed to grasp how such decision-making is refracted through the lived experiences of the pandemic. Engagement with consumption patterns and practices in both the Global South and Global North and across a wide range of socioeconomic groups is also important. Geographical perspectives have much to offer an agenda envisioning more sustainable food systems during and beyond the pandemic by capturing and learning from the ways in which the crisis works through diverse configurations of consumer practices and spaces in different countries and regions of the world.

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Chapter 33
The Place, Labor, and Networks of Transportation During COVID-19

Michael Widener and Julie Cidell

1 Introduction

As people around the world began to shelter in place to help prevent the spread of COVID-19, one of the most immediate and easy to observe changes to the daily patterns of everyday life was the sudden stop to global, regional, and local transportation systems. In cities with busy airports, the familiar stream of airplanes slowed to a trickle. Signs at the entrances of public transit stations informed travellers of closures and schedule changes. And for a few months, streets in major cities went quiet as only essential workers commuted. While not often considered places in and of themselves, transportation networks are locations that host many workers, commuters, and others looking to get from one location to the next. As it has on so many other aspects of life, COVID-19 has had a tremendous and possibly long-lasting impact on places of transportation. In this chapter, the impacts of the pandemic are considered at global and local spatial scales, and then thoughts about how transportation geographers can contribute are shared.

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2   Global Transportation

COVID-19 has changed how places and flows affect each other when it comes to systems of air travel and freight by making the underlying, unseen mobilities that so many of us depend upon suddenly visible. The question remains of how long that visibility—and its political implications—will linger after the pandemic has gone.

When it comes to air travel, there are three main impacts of COVID-19 that all reflect a common theme: the flip side of connectivity is vulnerability. First, air travel itself was the vector for the initial spread of the disease. Global city-regions like Milan and New York were among the first places outside of China to have significant numbers of infections. Per capita rates skyrocketed first in elite vacation places like ski resorts in the Alps and Rockies, later transmitted via air travel to northern Europe and Mexico (Linthicum 2020). As air travel has slowed, places that rely on long-distance tourists for economic survival like New Zealand are struggling with how and when to reestablish aviation connections to the rest of the world, lest a local outbreak occur.

Second, the aviation industry itself has changed rapidly and perhaps irrevocably. Airlines put older planes into retirement faster than expected, aircraft manufacturers shut down production lines (e.g., the A380), and airports scrambled to deal with massive declines in revenue. Route networks have been pared back, and entire airlines have gone out of business, resulting in airports losing service. Weather-related delays no longer cascade across North America when there is a thunderstorm at a hub airport because there are few enough planes in the air that the schedule is barely disrupted. And load factors are affected not just by the usual demand calculations but by hardened national borders that keep would-be travelers from countries with numerous cases from entering those that are relatively safe.

Finally, aviation is also a workplace. Flight crews have contracted COVID-19, with dozens dying from it in the early stages of the pandemic. These are now the people on the front lines dealing with recalcitrant passengers who do not want to wear masks, or those who are frightened and stressed from traveling, with no extra compensation as a result (Mzezewa 2020). Air travel also serves as a workspace for business travelers who have relied on face-to-face interaction even when great distances need to be crossed to achieve it. With the rise of work-from-home technologies, telecommunication might have to suffice for the time being and may substitute for significant amounts of travel in the future.

When it comes to freight and logistics, COVID-19 has had the strong effect of making visible people and places within our transport systems that are unfamiliar to most. As "essential workers," people employed at distribution centers, trucking, and other elements of the supply chain have continued to work in hazardous conditions. Amazon is one of many companies where workers have struggled to get hazard pay in accordance with those conditions and where lives have been lost (Ghaffary and Del Rey 2020). Those of us fortunate enough to shelter in place have relied on these workers to get us essential items, transferring risk from our bodies to theirs for a small extra charge.

The supply chain itself has become more visible. The much-vaunted disappearance of toilet paper from stores in March revealed the difficulty of instantly increasing supply for a product that normally has constant demand. The closure of restaurants and schools meant that food supply chains for milk, potatoes, and other agricultural products were shut off and could not easily be rerouted to supermarkets where demand had increased, leaving visible piles of produce rotting in the fields or milk poured down farm drains. At a larger scale, ships were backed up in the ports of the Global North as demand for goods reduced, and oil tankers were left floating at sea with nowhere to go. At the same time, between over 120,000 sailors are stranded at sea due to lockdown measures that forbid them as foreigners from disembarking to switch crews (Kaufmann 2020). The just-in-time model of production and the global logistics systems accompanying it have shown its limits. Going forward, will any redundancy and surplus be reintroduced into the system, or will there be pressure to return to the old hyperefficiency as quickly as possible?

3   Local Transportation

Just as the global flows of people and goods have changed during the initial months of the pandemic, local places of transportation have also seen dramatic shifts. Of course, these changes are not uniform across all regions and populations, but as the response to COVID-19 has evolved, general patterns in changing local transportation have emerged. Mobility data released by Apple and Google have shown that during the initial months of COVID-19 spread, travel within cities drastically slowed as residents were encouraged to stay at home, leaving mostly essential workers moving through the streets. Early explorations of these data indicated the sharp reduction of travel helped to enforce physical distancing protocols, tying larger decreases in travel with reductions in COVID-19 spread (Yilmazkuday 2020). However, as of July 2020, these data indicate mobility is again on the rise across the globe, regardless of the local number of cases. While the general local transportation trends are useful for numerous reasons (e.g., estimating spread), there are many important questions transportation geographers must ask about how intraregional movements are changing as the pandemic evolves.

To start, the initial lockdown highlighted many of the transportation inequities experienced by lower-income workers, and especially those who rely on public transportation. Grocery store employees and service workers at healthcare facilities, for example, continue to perform valuable and essential labor, allowing households to meet their basic needs and sustain critically needed medical services. Simply by going to their jobs, these workers are potentially exposing themselves to a deadly disease. But the reliance of lower-income workers on transit puts them at even further disadvantage in two ways. First, public transportation requires nonacquaintances to travel in relatively close proximity in an enclosed vehicle, which increases risk of transmission. Because of this, there have been calls to avoid use of this mode by the medical community (Sen-Crowe et al. 2020) without serious thought about

alternatives. Second, with the overall population of commuters dropping to unprecedented levels, transit systems around the world have reduced service. A recent study demonstrated that in some cities, there was a trend showing lower-income "vulnerable" neighborhoods being disproportionately impacted by cuts to transit (DeWeese et al. 2020). Beyond making the commute of transit-dependent essential workers more difficult, these service cuts also place a burden on the entire transit-dependent population who use this mode to perform important activities (e.g., grocery shopping).

With the aforementioned reduction in public transportation and most people not commuting by any mode, a second emerging phenomenon worth examination by transport geographers at the local scale is the emergence of movements to create streets more welcoming to active transportation. As the number of people using cycling as a way to avoid busses, subways, and ride-sharing, or to simply catch some fresh air, cities around the world have responded to demands to reexamine how road space is allocated. From Kampala to New York City, relatively cheap and quick-to-implement cycling infrastructure projects have reclaimed lanes formerly dedicated to automobiles. In other cities, governments have moved to increase space for active transport and outdoor exercise for cooped-up families. While these "take back the streets" initiatives have generally been well received, it is critical that they are distributed equitably across neighborhoods and cities, so their advantages are not only enjoyed by those with the most political and social capital.

A third topic for exploration by transport geographers includes asking how the pandemic is affecting workers who occupy the liminal spaces that move people and goods within regions. Transit employees and delivery workers have continued to provide their services without pause, but the pandemic has revealed serious issues with these lines of work. Many who work as deliverers—and thus in a constant state of transport—are contingently employed, receive low incomes, and lack health benefits. Workers in Brazil who deliver food for popular apps recently protested their working conditions, noting the sharp increase in demand and precarious working conditions (Rochabrun and Mello 2020). And while in many cases transit workers are afforded protections through their unions, the pandemic has exposed how unprepared public transportation agencies were for this scenario. For example, in New York, dozens of transit workers have died, with interviews pointing toward disorganized initial responses to limiting passengers on vehicles and reprimanding drivers who brought their own masks and disinfectants to work (Goldbaum 2020).

4   How Will Places of Transportation Change?

It is likely that the transportation networks established before the pandemic will be substantially different for the short and medium terms. With public transportation agencies facing financial crises, will governments step in to fully fund and potentially expand these systems to reduce local transportation's contribution to climate change? Will contingently employed deliverers acquire fair wages and other

employment protections? And will carbon-intensive air travel and global freight systems be reexamined, or will a new system emerge to replace globalization that is less vulnerable to the health and societal impacts of future pandemics?

COVID-19 has clarified the role of transportation in both enabling and restricting physical and social mobility. Transportation geographers are equipped with the theories and tools necessary to navigate the spatial and temporal scales that places of transport transcend, link them to other relevant concerns (e.g., climate change), and begin to address key questions that will drive transport policy in the twenty-first century. However, longer-term positive social changes to places of transportation, and those who inhabit them, will require sustained activism to come to pass.

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Chapter 34
COVID-19: Pandemic on an Urban Planet

Roger Keil

1 Introduction

In *Plagues and the Paradox of Progress*, Thomas Bollyky (2018, p. 107) mobilizes Jane Jacobs to posit that "cities were once the most helpless and devastated victims of disease but they became great disease conquerors." True to the subtitle of the book—"why the world is getting healthier in worrisome ways"—Bollyky readily admits that Jacobs's puzzle has not yet been fully resolved. Today's urban world is one of great unevenness, and that is reflected in the different ways cities have dealt with the various infectious disease, or "monsters at their door" as Mike Davis (2006) might have it. Now that the monster has "entered" in the form of the novel coronavirus SARS-CoV-2, it does its relentless work, making humans around the world ill with COVID-19 (Davis 2020). The rapid spread and planetary impact of COVID-19 is a function of being the first pandemic of the urban age. By any standard, statistically (United Nations 2019) or epistemologically and ontologically (Brenner 2014), we are now living in a majority urban society. Yet Bollyky (2020), for one, differentiates two kinds of urban worlds: one that is settled, resourced, and sufficiently infrastructured, and one that is emergent, underresourced (and underdeveloped), and lacking infrastructures. Clearly, the path of the pandemic—so universal, so global at first glance—like other outbreaks before it, primarily and mercilessly exposed the unevenness of this urban world both in impact and response. But as the urban world has many aspects of uneven development, the response to the virus was often surprisingly unpredictable and unsymmetrical: some of the wealthiest cities with the most advanced health-care systems suffered many infections and high rates of deaths while informal settlements in poorer cities often succeeded to combat

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COVID-19 with community-based methods that had been honed in previous or ongoing outbreaks (Ali et al. forthcoming).

In 2003, another coronavirus, severe acute respiratory syndrome (SARS), took its toll on a number of cities predominantly in east and southeast Asia and Canada. While it never reached the pandemic proportion of COVID-19, it sent shock waves through the network of global cities and financial centers such as Hong Kong, Toronto, Beijing, and Singapore (Ali and Keil 2008). In 2020, it also served as a portent of what was to come with COVID-19. Global cities turned out to be a prime site for infection because of their connectivity in the capitalist commodity chain but also through their migrating diaspora populations (Ren and Keil 2017). Airports turned out to be focal points of infection control as did adjacent or related spaces of globalization. Global urban nodes have long been hit hard by disease outbreaks, long before urban life was common across societies that remained agricultural and rural for the most part. One such example has been Istanbul. Modern-day Istanbul, like its prior incarnations Byzantium and Constantinople, has perhaps been the most iconic of all global cities. A center of any known world from humankind's earliest urban settlements to the current age, the city symbolizes like no other a crossroads of cultures and communities, a transportation hub, an intellectual center, and an economic powerhouse. Perched on the isthmus of the Bosphorus, Istanbul, has been a way station between many worlds, Asian and European, Islamic and Christian, the south and the north.

Being so exposed has advantages as trade routes pass through the city, ships come from all corners of the world. Today, Istanbul has, by some counts, the world's biggest airport and hosts Turkish Airlines, the world's largest airline "by destination served," but it also borders on volatile geopolitical regions that have seen conflict for years and have sent millions of refugees to and through the city (The Brussels Times 2019).

Due to its position in the center of so many historical and current flows, Istanbul has always been a prime site for the outbreak of infectious diseases. This was the case, for example, when the medieval bubonic plague moved through its port. The disease caused by the bacterium *Yersinia pestis* had travelled along the far-reaching trade routes that connected Europe with China. Ships of infected fugitives from the Crimean city of Caffa (today's Feodosia) came through Istanbul on their way to Sicily, often seen as the origin of the plague pandemic on the European continent—cited, with the "Spanish flu" of 1918, as among the most destructive contagion events in human history (Kelly 2006; Varlik 2015).

Even in this current pandemic, Istanbul was initially the most affected place in Turkey which prompted the country's health minister Fahrettin Koca to declare that "Turkey's Wuhan was Istanbul" (Associated Press 2020). But COVID-19, in contrast to SARS before it, did not stay in the global cities. It became a problem much more of the extended urban landscape that is now characteristic of our global settlement pattern.

2   A Pandemic for Every World

A common dictionary definition of a pandemic is "an epidemic occurring world-wide, or over a very wide area, crossing international boundaries and usually affecting a large number of people" (Kelly 2011). Yet every pandemic is both a *quantitative* reality—called pandemic because it has a measure of distribution across nations and regions—and a *qualitative* and somewhat imagined/constructed reality; each pandemic is as big as the world we imagine it to happen in. The world of the plague in the 1340s was a different one from the world of the "Spanish flu" after World War I, for instance. And the world of COVID-19 dramatically differs from the one of that pandemic a century ago.

Of course, pandemics always occur on the same physical planet, but they are experienced in vastly different imagined realities. This is no different from COVID-19. The current crisis shows us the perimeters and the parameters of the world we inhabit. COVID-19 exposes an expanded perimeter of the east-west and north-south world economies. The Chinese Belt and Road geography begins to reveal its reach, the world's two remaining superpowers square off (with one ostensibly rising, the other one descending), and the nature, sites, and impact of human life have become vastly expanded in extensive and massive forms of global urbanization. The parameters of that economy also change as the territories, politics, and governance mechanisms of the urban world shift simultaneously with the spread of the virus (Dodds et al. 2020). The parameters are further transformed as the narrative of the virus's impact develops in seeming simultaneity in a digitally connected world of webinars and podcasting, allowing for instant comparativity and place-specific nuance at once (Rogers et al. 2020).

Looking at the large literature on urbanization and disease and the broad spectrum of infections that have afflicted cities across the world and in history, we can differentiate demographics, infrastructures, and governance as enduring themes (Connolly et al. 2020).

3   Demographics

For the longest time, cities and urban life were marginal to the human experience. Even in 1918, when the "Spanish flu" made 20–40% of the world's population sick and killed 50–100 million, only 15% of the world's 1.9 billion people, roughly 270 million, lived in settlements over 20,000, most of them in Europe and North America (United Nations 1969). Today, the demographic tables have turned, and by any measure, there are now more urban dwellers than rural people, and those urbanized humans are both concentrated in large megaregions and dispersed farther afield in connected settlements of all size and form. "Urban society" now determines the constraints and possibilities of our lives, and as we now realize, also our illness and

even death. The entire urban expanse now houses 4.4 billion humans out of a 7.8 billion total by some measure, which is 56% overall (United Nations 2019).

Whereas COVID-19 is the first pandemic affecting the population of an urbanized planet, it is a pandemic of the social and spatial periphery. It creeps into the regions of our society that are least protected and are most dispersed. The capitals of capital and capitalism—New York, London, Milan, and Wuhan—seem to have been most affected at first. But if we look closely, there are also the Detroit's, Wolverhampton's, Bergamo's, and Toronto's impoverished inner suburbs that have taken the brunt of infection, illness, and death (Biglieri et al. 2020). A world of massive global suburbanization has been expecting this virus (Güney et al. 2019). This is an extended world of residential, work, and recreational landscapes and institutional spaces of care, policing, and control. It includes university campuses and meatpacking plants, the warehouses, and switching stations of e-commerce companies in suburban or rural areas out of most people's sight. The pandemic has highlighted the significance of those usually invisible peripheral workplaces and workers' vulnerability as it has cast a spotlight on jobs related to other platform-based work such as AirBnB or Uber that had only recently been celebrated as innovations of urban life.

It is many of the weakest, most peripheral communities, racialized, vulnerable, and marginalized at the best of times, that have been most affected in this pandemic. In many countries, the elderly have been prime victims of COVID-19 not just because of their biological age but also because many of them are forced to live in underfunded, overcrowded, badly designed, geographically segregated facilities; this has been a social (and sometimes spatial) peripheralization with consequences (Biglieri et al. 2020).

4   Infrastructure

Pandemics don't happen in a world that is not connected through local, regional, national, and importantly global infrastructure. And the distribution of, access to, and impacts from those infrastructures are highly unequal. Today, our means of transportation have accelerated, and the routes of connectivity have been shortened. At the times of SARS in 2003, the global airline industry transported just under two billion annual passengers. When SARS-CoV-2 first boarded a plane in the body of a human being, that number had risen to 4.7 billion (Mazareanu 2020). But it isn't just international travel that is deemed a source of rapid and widespread transmission. Regional, and indeed urban, traffic and transit contribute to heightened levels of interpersonal contact. Nonessential travel was advised against everywhere as lockdown measures were taken. While many, especially essential workers in our cities that have to travel to their jobsite, are still reliant on public transportation, passenger numbers across municipal transit systems plummeted dramatically since isolation measures were implemented (CBC News 2020). Many transit workers fell ill, and some died.

Yet the availability and accessibility of infrastructures for mobility at various scales—across continents and across the neighborhood—have a flip side. For many individuals and communities in today's urban world, there is forced mobility as experienced by refugees, many of them in camps and other crowded spaces. In cities across the world, it is the poor who are both most reliant on public transit and often kept from using it as service levels where they live and work are low, and ticket prices are too high.

5 Governance

The importance of cities as sites of global health governance seemed to have grown since the SARS epidemic put large urban regions and their relationships on the map. At the time, health governance experts like David Fidler (2004) assumed we might be entering a post-Westphalian era of minding the world's affairs relating to disease, health, and well-being. The World Health Organization passed the International Health Regulations in 2005, which codified the protocol among member states of the WHO to the organization and to each other. In 2009, the WHO followed up with a document titled "Cities and Public Health Crises" that explicitly recognized the role of cities in international health governance. Yet during COVID-19, 17 years and three pandemics later, the role of cities in global health governance appears to have advanced more slowly than some had assumed. Still when in North America, for example, urban centers and suburbanized regions saw the death toll rise in their poor and racialized neighborhoods and institutions such as long-term care homes, and municipalities took some matters into their own hands. Moreover, as the streets of the cities under lockdown became the stage for large-scale protests following the murder of George Floyd in May 2020, the politics of urban justice bled into the governance and planning for recovery toward a different urban society wherein racial justice, climate change, and public health security became part of urbanist agendas.

6 Conclusion

For an urban take on COVID-19, we can leave it at four possible lessons. (1) We all live in an urban society, and the diseases we have most likely are diseases in and of that urban society. (2) The urban is not a collection of distinct towns and cities but a set of built, social, and natural environments that are connected through urban life-styles and priorities shaped by urban life's demands and needs. (3) In this urban world, local and regional jurisdictions remain important, perhaps more than ever, as bounded forms of territorial decision-making and governance areas that are also connected to other such areas regardless of their location in a particular nation state; and (4) the urban society, or this urban world, produces new types of social conflict and politics which will demand responses from authorities far and wide.

These insights leave us with an expanded range of future research and action challenges. Fixing cities in light of the COVID-19 experience must take into account what climate justice writer Mary Annaïse Heglar (2020) has called "the age of crisis conglomeration. It is no longer useful or honest or even smart to look at any of them through a single lens." As an urban research problem, the pandemic, at a minimum, needs to be seen in relation to the issues revealed by the structural anti-Black racism in our cities and the devastating consequences of the climate crisis for precarious urban life (Acuto et al. 2020). The immediacy of threatening contagion in this outbreak must be brought in connection with the slow burning crises that Black, Indigenous, and other people of color have been enduring for hundreds of years. Urban life has always been complex and complicated, and issues have been difficult to separate out from one another. Housing and transportation, for example, have forever been linked in many ways. But the layering of social, political, environmental, and health crises as we have experienced in 2020 will not allow receding to any singular analysis or research strategy. In practical terms, however, it will not suffice or be automatically productive, of course, to point to climate change or urbanization as root processes for the changes we see happening in real time today, or to capitalism as the driver of rising inequalities and exploitation, or to reduce every issue of urban life to histories and geographies of colonization and slavery *without being specific as to how we are going to research the particular consequences of these processes*. While the pandemic has been a universal experience in urban society, our research needs to reflect the experience of the specific communities that have been affected and seek their participation and even leadership and guidance in all disciplines of urban research. The same is true for action. While urbanists have been quick to point to rapid changes to urban form and fabric as a precondition for meeting the joint objectives of social distancing and reduction of greenhouse gases—restrictions to automobility, increased infrastructures for active transportation, etc. are obvious examples here—the city after COVID-19 must ultimately be shaped by more far-reaching social justice interventions that will allow for different forms of redistribution and tenure in housing, safe access to public space including new walking or bicycle infrastructures, and mobility justice more generally.

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Chapter 35
Geographies of the Rural and the COVID-19 Pandemic

Andrew S. Maclaren and Lorna J. Philip

1 Introduction

The COVID-19 pandemic offers a lens through which to (re)consider strengths and weaknesses of contemporary rural society. Such a place-specific perspective on the pandemic provides an opportunity for rural geographers to further their explorations of how everyday lives are experienced and to reflect on positive, negative, short- and long-term outcomes of the crisis. 'Rural' is complex and diverse, the 'other-than-urban meets the multifarious conditions of vastly differing scales and styles of living' (Cloke 2006, p. 3). In this contribution, we focus on rural places within the Global North and are guided by Gallent and Gkartzios' (2019, p. 39) observation that 'rural areas can be defined by their assemblage of material assets (patterns of land-use, economic activity, built form, etc.) and immaterial qualities (their particular social life and the subjective experiences of being in a rural space)'. Amidst this plurality of material and immaterial attributes, rural geographies and geographers have focused on how people live in these diverse *places*, considering a study of rurality as 'the study of the processes through which rurality is produced, reproduced, and contested, and of the places and practices that are associated with "rural" ways of being' (Woods 2009, p. 429).

The practices and rhythms of everyday life have been disrupted by COVID-19. Comparatively few commentaries on this disruption have focused specifically on

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impacts of the pandemic beyond urban areas. Here, we offer some reflections on how rural contexts embody and enact place-based experiences and responses to an emergency situation, illustrating vulnerabilities and strengths in response to the pandemic that have implications for rural futures.

2   Rural Spaces at a Time of Crisis

The effects of COVID-19 in rural places are too many and varied to be fully dissected here. By means of illustrating place (rural)-specific experiences felt in many national contexts, four themes are now considered.

2.1   *A Rural Safe Haven*

Population density is one of several factors determining vulnerability to COVID-19. Worldwide, the highest numbers and rates of infection have been reported in large cities (Quinio 2020). However, rural communities have also seen outbreaks of the virus, challenging the 'safe haven' narrative which represented rural areas as a refuge from infection where small, dispersed populations facilitated social distancing, and attributes of the natural environment would support a better quality of life during a period of lockdown. As COVID-19 spread, an urban to rural exodus was witnessed across the Global North. Large numbers of people who owned a rural second home or a camper van or had family members already resident in a rural area took flight as the imposition of national lockdowns loomed (see Gallent 2020). Concerns about this exodus were quickly raised by rural communities and their civic and political leaders. In the United Kingdom, despite the national lockdown imposing travel restrictions, some rural communities were so concerned that they took direct action during lockdown to keep non-locals out, erecting 'keep out' notices and closing car parks and other visitor facilities. They were fearful because local health and social care services and the physically distant hospitals serving their communities lack the specialised facilities, equipment and staff required to deal with a COVID-19 outbreak: COVID presented a risk to already fragile rural health and care services.

2.2   *Living in Rural Places: Fragile Services and Community Responses*

Rural communities are often tight-knit and socially cohesive entities where community spirit is strong and social capital is deployed to support a myriad of formal and informal activities, services and facilities. But these actions are not simply

enactments of an idyllic rural life. They are often the outcome of efforts to compensate for inadequate local services and facilities which have become more pronounced in recent years in response to the roll back of public services and concentration of social and private sector services – from post offices to pubs, doctors to dentists, banks to bakers – up the urban hierarchy. Put crudely, it has been out of necessity that 'tight community networks able to self-organise to adapt to structural changes' (OECD 2020, p. 5) have evolved.

One underlying structural change of rural communities has been demographic ageing. However, rural geographies of ageing have created a strength of rural places. Those who live in rural areas are more likely to volunteer than their urban counterparts (NCVO 2019), and volunteering rates are highest amongst the 'young old' (those aged 60–74). However, significant numbers of those normally involved in physically delivering voluntary, community and social enterprise activities were prevented from doing so by social distancing and shielding guidelines, introduced because older people, especially those with underlying health conditions, are those most likely to fall seriously ill if they contract the virus. The volunteer pool could have dropped substantially at a time when demand was increasing, yet numerous examples of innovative responses have been reported (see Harrison 2020) which have included younger community members and local businesses taking action and the deployment of digital platforms by people of all ages which has helped to counteract the loss of in-person interactions.

Retail options within most rural communities are limited (Wilson 2017), with rural populations used to travelling for 'the big grocery shop' or for occasional, 'big ticket' items. With the growth of digitalisation, many rural residents are habituated to online shopping to mitigate deficiencies in the local retail sector. During the pandemic, national governments encouraged the public to make use of online retail services. However, the pandemic compounded existing barriers for rural residents such as hefty delivery charges or specific carriers not delivering to remote addresses. Difficulties in securing delivery slots for items such as groceries proved particularly problematic for rural residents without alternative local shopping options. Online retail also relies on customers and suppliers being digitally enabled: the pandemic has further highlighted existing rural digital inequalities.

2.3   COVID-19, the Rural Economy and Employment

Rural places are often considered synonymous with farming landscapes and an agricultural economy. COVID-19 has had a substantial impact on the farming sector due to vulnerabilities within the food supply system (Maye 2020). Local and international travel restrictions have made it difficult to recruit the seasonal workers horticulture relies upon, and maintaining social distancing is difficult whilst undertaking many agricultural tasks.

The OECD (2020, p. 14) articulated a timely reminder that 'rural economies are particularly vulnerable to economic shocks due to their less diversified economic

base and greater dependency on tradable activities, which tend to suffer during economic shocks'. The backbone of the rural private sector is small, often micro, businesses, many in the service economy (including leisure and tourism) and small-scale manufacturing and retail. These enterprises support numerous rural jobs and the OECD's warning that 'without further support, one-third of SMEs are at risk of going out of business within one month, and up to 50% within three months' is of concern (OECD 2020). Some rural enterprises have been able to amend their business model to incorporate home delivery or to produce a new product, contributing both to local community resilience and ensuring sufficient cash flow to keep the business viable in the short term. Many businesses, including non-essential retail, tourism and leisure, were required to cease trading under national lockdown restrictions and, despite job retention schemes and the availability of various government-backed loans, face an uncertain future (Phillipson et al. 2020). The influx of tourists that sustain the economy of many remote rural places may not materialise for some time after domestic and international travel restrictions are lifted, further compromising business viability once lockdown is eased.

2.4   A Rural Digital Economy and Society

The COVID-19 pandemic has enforced working from home at rates hitherto not seen. The ability to do this, and for businesses to enhance their digital capabilities, for children to engage with online education and for personal interactions to be maintained via social media and videoconferencing, requires domestic and business premises being served by fit-for-purpose digital telecommunications. Rural ICT infrastructure supporting reasonable upload/download speeds and reliable connections is far from universal, thus the rapid upturn in deployment of digital platforms to support all domains of life as the pandemic took hold across the world presented a further challenge in rural places and highlighted existing territorial digital divides (OECD 2020) and the need for rural places to become more digitally connected.

3   Post-pandemic Differentiated Outcomes for Rural Places

The COVID-19 pandemic has simultaneously brought new challenges, stimulated innovative community responses and exacerbated existing inequalities that all warrant interrogation from a place-specific perspective. As we seek to adapt to a 'new normal', what may be in store for rural communities across the Global North? Rural areas, especially remote and sparsely populated areas, were already economically fragile before COVID-19 brought additional economic travails. For example, what will the shape of the rural tourism industry, a mainstay of many local rural economies, be in 5 years' time? Without further, and longer-term, external intervention, their public, private, voluntary, community and social enterprise sectors may lack

the financial and social capital required to 'bounce back' from the pandemic. Rural areas thus face an uncertain economic future, and national governments should take action to ensure that they are not overlooked in the post-pandemic recovery programmes.

Discussions in the media and other forums suggesting that COVID-19 will prompt a new wave of counter-urban migration have continued months after nationwide lockdowns were first announced. On a positive note, 'partial social restrictions or total lockdown experienced in some countries could have reverted citizens' priorities leaving space for "rural renaissance"' (de Luca et al. 2020); representations of the rural as a 'safe haven' may provide a stimulus for a rural population turnaround in the many areas where depopulation is an endemic challenge. However, an influx of comparatively affluent newcomers could, in some locales, exacerbate existing housing challenges, adding competition for limited housing stock, pushing prices up and further threatening the affordability of housing for the existing resident population. In-migration may be spatially concentrated in a few 'attractive' destinations, or it may be a catalyst for a population revival in others. The proven experiences of many employees that they can work effectively from home may create new opportunities for more remote working that in turn allows preferences for living in rural places to be realised. Fewer commuter journeys could have environmental benefits, and, with less money being spent on travel, rural residents who transition to working from home may increase their spending in local shops and on local services, helping sustain existing jobs and perhaps stimulating the creation of new employment opportunities. The myriad expressions of community solidarity and endogenous social innovations in response to the crisis could further enhance the liveability of rural places, provided that sufficient local capacity to sustain voluntary efforts beyond the short term is retained. Pressure on local housing supply, house prices, utilities and public transport and the social turmoil that can arise following a recomposition of local populations a rural renaissance could bring may outweigh any potential stimulus to rural economies. Moreover, if efforts to redress the digital divides already acting as a drag on rural areas continue at a glacial pace, will a perception of 'rural places as backwaters' remain, with places unable to support the new future of home working, e-commerce, e-business and e-social lives?

At the time of publication, an end to the pandemic, and the havoc it has wreaked on the global economy and on the lives of individuals, is appearing on the horizon, underpinned by mass national vaccination programmes the scale of which have not been seen before. What can be said with certainty is that the COVID-19 pandemic has had tangible, place-mediated impacts on material and immaterial expressions of contemporary rural life. There is considerable scope for new research spanning immediate and longer-term timescales that seeks to track and evaluate COVID-19-related change and its impact on rural people and places. For example, research in the medium term that identifies and evaluates patterns, drivers and impacts of a COVID-stimulated urban to rural movement of population would offer insights into future demographic trajectories and associated socio-economy sustainability of various types of rural area. New research opportunities exploring emerging relationships between place of residence and place of work, travel patterns and consumer

behaviour have been opened up by the pandemic, findings which would inform transport planning, support further calls for investment to address digital inequalities and, potentially, help efforts to sustain rural town centres. Will the community spirit engendered by lockdown persist, further enhancing the appeal of rural areas as 'good places' in which to live? Is the volunteer base capable of responding to other external shocks, such as further retrenchment of public services as the state seeks to repay the debt incurred in responding to the pandemic? Looking to the future, which rural areas will be 'winners' and which will be 'losers' as a new normal is established? We can only hope that the insights rural geographers and others concerned with rural places continue to offer, as the world lives through this unprecedented period of turmoil, help lay the foundations for better, more sustainable rural places in the future.

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Chapter 36
Global Spaces: COVID-19 and the Reconfiguring of Global Health

Clare Herrick and David Reubi

1 Introduction

The global pandemic of novel coronavirus and its associated disease, COVID-19, has been described by *Lancet* editor Richard Horton as 'the most acute global health crisis since HIV' (Horton 2020a, p. 1534). Certainly, the global case numbers and associated death toll are unprecedented, but so too has been the international response. This may be a 'global health crisis', but much of the management of the pandemic has been configured at the national scale and experienced at the most local of scales. Indeed, while the World Health Organization (WHO) has played a very visible role—and arguably been far more timely in its response than during the West African Ebola outbreak of 2013–2016—it has also now seen its US funding pulled by President Donald Trump for its purported support of China during the pandemic (Horton 2020b). While the actions of the United States are perhaps the most high profile, it should be remembered that there are significant geopolitical tensions between member states, and COVID-19 has only exacerbated existing divergencences in country-level global and national health priorities. The current 'global health crisis' is thus not simply the threat to human life but one that now stretches into the very existence of the enterprise of global health itself.

As we will argue here, this existential crisis has been magnified by the very ways in which global health is configured and understood. Central to this have been the implicit and explicit geographical configurations that 'make up' the field. COVID-19 has thus rendered global health both indispensable and utterly obsolete as the

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problems long associated with *elsewhere* have come to be the problems of *home*. Indeed, as the presumed differences between the high- and low-resource countries of the Global North and South are thoroughly imploded by the effects of a novel virus, this chapter will explore how the future of a global health enterprise so dependent on the maintenance of such geographical distinctions and imaginaries now looks deeply uncertain.

2 The Imagined Geographies of Global Health

For a domain that is so inescapably geographical, it is notable that geographers have tended to be at the disciplinary margins of global health (Herrick and Reubi 2017). Yet global health cannot be understood without also considering the spatial and the scalar. The notion that global health is somehow 'global' in scope has been revealed to be a fallacy given the very distinctive geographic flows of expertise and investment across the world and the existence of numerous 'hotspots', particularly in sub-Saharan Africa (Brown and Kelly 2014; Herrick and Reubi 2017). Indeed, a recent series of exchanges in the *British Medical Journal* highlight the tenor of the debate over these geographies of global health. In it, King and Koski (2020, p. 1) propose that global health be defined as 'public health *somewhere else*'. This assertion is based on the notion that global heath is the practice of 'public health somewhere – a community, a political entity, a geographical space – that [is not] home' (King and Koski 2020). In essence, doing global health means travelling away to do what would be called 'public health' should its practitioners have remained at home. The need to travel—even in the face of great need at home—King and Koski argue, is underpinned by a 'sense of duty to address inequalities' and 'deep commitments to social justice, equity and solidarity' (King and Koski 2020). They further argue that global health is underpinned by an 'assumed expertise gradient' and a 'perception that problems elsewhere are simpler than those at home' (King and Koski 2020, p. 2). The outcome of this, they suggest, is that 'somewhere else' becomes a 'blank slate for intervention' and is justified by an often 'uncritical faith in Western expertise', where 'we … from wealthy countries in the global North have superior understanding about how best to identify, prioritise and solve pressing health problems' in the Global South (King and Koski 2020).

Others have made similar arguments. Betsy Brada (2011, p. 285), for example, draws attention to the ways in which 'resource-limited or resource-poor settings' are constructed as 'the quintessential spaces' of global health in medical education and practice. Specifically, she shows how American doctors and medical students coming to do work placements and internships in Botswana's largest hospital describe the practice of medicine there, compared to the United States, as 'going back in time' to a place characterised by 'limited resources, inadequate guidelines, outmoded practices and medical staff who are … incompetent' (Betsy Brada 2011, p. 297). In the same way, Todd Meyers and Nancy Rose Hunt (2014, p. 1922) question why global health is 'limited in practice or imaginations to formerly colonised

worlds from Africa to India marked by extreme poverty, catastrophe, disaster and war'. Why, they ask, do places like Detroit with their high 'rates of disease, of crime and insecurity, of penury and income inequality' remain on the 'periphery' of global health? Should we not include this 'other global South' in global health efforts? (Todd Meyers and Nancy Rose Hunt 2014). These questions have been rendered even more urgent by the starkly nationalistic responses to COVID-19 across the world that have seen the geographies of human 'need' fundamentally reworked.

3   COVID-19 and Global Health

As Jean-Paul Gaudillière and Claire Beaudevain (2020) have argued in a recent piece in *Somatosphere*, the COVID-19 outbreak has the power to disrupt these imagined geographies of global health and 'the illusory dichotomy between the Global North and the Global South' in a number of ways. Most obviously perhaps, the outbreak has upended the usual geographical distributions of infectious disease mortality and morbidity. Indeed, as a global pandemic, COVID-19 is affecting people *everywhere*, from China, Iran, and Italy to the United States, Brazil, and India. In other words, the outbreak has revealed that the threats posed by novel viruses or 'emerging infectious diseases' (Weir and Mykhalovskiy 2010) are real for all of us. It has also highlighted the complacency of countries in the Global North which, believing that such pandemic threat was a problem of *somewhere else*, failed to prepare against a catastrophe that many in the field have warned of for years (Morse and Schluederberg 1990; Oaks et al. 1992; Garrett 1995). Even where their own pandemic preparedness exercises indicated both the very real threat and the absolute lack of national capacity to respond—for example, see Exercise Cygnus in the UK—politicians not only ignored their own advice but, in many countries, actively dismantled and defunded the very infrastructures needed to respond.

COVID-19 has also severely compromised the presumed resource gradient between the Global North and South. This was vividly illustrated when European countries and the United States, having outsourced much of their industrial production capacities during the last three decades of economic globalisation, scrabbled to acquire personal protective equipment supplies from the Global South while middle-income countries like China and Russia donated personnel and resources to the European and American health effort (Gaudilliere and Beaudevain 2020). Within European hospitals, the lack of treatment protocols for COVID-19 patients and scarcity of essential medical equipment and drugs have forced doctors to engage in the same kinds of 'improvisation' more usually associated with medical practices of the Global South (Livingston 2012). The frequent critiques of global health's 'neo-colonial' overtures (Horton 2013) have been upended and complicated by COVID-19. Indeed, as Gaudillière and Beaudevain thus contend, 'the COVID-19 pandemic could mark the moment when a vision of European hegemony bound to outdated 20th century post-colonial experiences was finally shaken to its foundations' (2020, np).

Imagined geographies of global health have long been entrenched by flows of 'soft power', with not just resources but also expertise moving from North to South. This too has been disrupted by COVID-19 in a *literal sense* as global health projects and interventions across the world have been paused by travel bans and restrictions. And, also in a *figurative sense* as the usual, northern sources of expertise slam up against the absolute limits of knowledge of this novel virus, and the evidence emerges that the trajectory of COVID-19 has, thus far, been less severe (and arguably better managed) in the many of Africa's global health hotspots. It was Chinese rather than American or European scientists that first sequenced the genome of the COVID-19 virus. Chinese biotech companies are also at the forefront of the race to discover a vaccine against the virus. Moreover, many countries in the Global South have significant expertise and experience in infectious disease containment, testing, tracking, and tracing—precisely the inadequate infrastructure that has been so heavily critiqued in the United States and European responses. So, for example, while we must be careful not to erase the history of the often-chaotic and heavily critiqued response to the Ebola outbreak (Medecins Sans Frontieres 2015), it is undeniable that West Africa has gained expertise and experience from its fight against Ebola that is now being utilised in the COVID-19 response (Dalglish 2020).

4   Future Inequalities and Narrowed Geographies

But COVID-19 has not displaced the needs and differences that have long justified the enterprise of global health. Rather, the gross inequities in the disease's mortality profile—age, health status, ethnicity, deprivation, and occupation—have magnified the inequalities within and between countries. This is as true at home as it is elsewhere. The economic catastrophe that is now starting to unfurl from stringent viral containment measures across the world will create new forms of global health crisis. It is an irony of global health that as the field has grown exponentially and tackled some of the key drivers and outcomes of poor health and inequality in multiple countries of the Global South, health inequalities have been allowed to deepen across many countries of the Global North. Really then, the conditions that we have come to associate with global health *somewhere else* have long been a tragic reality at home too. COVID-19 is thus 'exploiting and accentuating existing health crises worldwide' (Horton 2020a, 1534) precisely at a time when the future and funding of global health seem so uncertain. Many in the field are calling for 'a more democratic, more multipolar, more networked, and more distributed understanding and operation of global health' (Dalglish 2020, 1189).

But as the fear that the pandemic threats long associated with *somewhere else* are now firmly embedded *here,* the tension between international cooperation and solidarity and retrenched nationalism seems irreconcilable. It might have been hoped that experiencing the same fears, anxieties, uncertainties, illness, and death as millions of others throughout the world would build a sense of global empathy. Our fear, however, is that the geographical horizons of 'global health' may well have

turned firmly inward, as the blame game about the virus' origins and the race between nations to secure access to PPE, vaccines, and therapeutics accelerates. Others are less pessimistic and point out that COVID-19 has sparked significant social movements, concern with inequality and its effects, and renewed calls for social justice. The pandemic has also sparked new forms of public-private partnership, investment, and innovation. COVID-19 should remind us that collective wellbeing is a fundamental prerequisite for individual wellbeing. It might also, as Marisa Casale (2020) asserts, provide the foundations for a transformed and transformative global health, far more aligned to human needs. The path ahead is still being built. Let's then hope that global health can emerge from this pandemic with a clear mandate for change.

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Chapter 37
Why Green and Blue Spaces Matter More Than Ever

Ronan Foley and Marco Garrido-Cumbrera

1 Introduction

Exposure to nature can contribute to improving the physical and psychological health and well-being of the population (Lachowycz and Jones 2013; Van den Bosch and Ode Sang 2017; White et al. 2019), and the global spread of the COVID-19 pandemic in 2020 has increased interest in and the importance of the role of natural environments. This has led to specific attention on "nearby nature," particularly on green/blue spaces, heightened by spatial constraints imposed by a range of lockdown measures across different countries and populations (Atkinson 2020; Honey-Roses et al. 2020). This revived interest in the value of natural spaces to health and well-being has additionally inspired recent research by medical/health geographers (Bell et al. 2018; Foley et al. 2020). Research on green/blue spaces considers more fully complex assemblages of human and nonhuman actors and forces that shape health and well-being outcomes within such spaces (Andrews and Duff 2019). In addition, wider issues of access to, and utilization of, healing and curative resources remain important for spatial equity and health outcomes (Rojas-Rueda et al. 2019). This has emerged as a core issue during a COVID-19 pandemic where a structured reordering of access to nature has emerged, both in the specific closure of parks, gardens, and coasts and in relation to different lockdown regimes (Jassi and Dutton 2020). At best, there has been

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limited or reduced access to public green/blue spaces, and this has renewed appreciation for the health-enabling value of nature (Duff 2011; Britton et al. 2018). It has also uncovered wider structural issues around differential access to green/blue space based on housing, work, and other markers of social and economic equity (Goodair et al. 2020). What seems most clear is that green/blue spaces matter more than ever in terms of their everyday value as health-enabling settings.

2   Health-Enabling Green/Blue Space

Building on therapeutic landscapes research, a focus on health-enabling green/blue spaces has spun out in different directions in the past decade, reflected in disciplines like psychology, physiology, and planning (Bell et al. 2018; Reese et al. 2020; Scott 2020). Specific approaches to valuing green/blue spaces for health and well-being incorporate social prescribing and health promotion as well as ecosystem services and natural capital (Astell-Burt and Feng 2019). The value of green/blue spaces for enabling physical activity and mobility more broadly has also been evident during lockdowns (Woods et al. 2020). Given enhanced levels of societal stress and anxiety around the pandemic, more passive well-being dimensions such as nature fascination and stillness are also being considered more fully (Atkinson 2020; Otu et al. 2020).

Recent research on green/blue spaces recognizes a heterogeneity of types, forms, and functions that shape therapeutic experience differently (Andrews and Duff 2019). Additional heterogeneous health-enabling practices shape how we use such spaces as healing resources over time (Phoenix and Bell 2018; Shanahan et al. 2015). The sustained importance of access and utilization has emerged through embodied geo-narrative work on sensing green/blue space that meaningfully combines individual and communal perspectives (Bell 2019; MacPherson 2016; Atkinson 2020). Recent research on green space has identified preferences for complexity and variation in elements such as tree height, species variability, or canopy form (Astell-Burt and Feng 2019; Mills et al. 2015). Other studies identify health benefits from enhanced exposure to green space including reduced hospitalizations and better respiratory and cardiovascular health (Bratman et al. 2019). From blue space research, the value of water margins has specifically emerged as well as enhanced physical activity and shared social encounters near coasts, rivers, canals, and lakes (Foley et al. 2019; Gascon et al. 2018; Wheeler et al. 2012). Methodologically, this research emphasizes embodied, emotional, and experiential elements, using in situ geo-narrative approaches coproduced with individuals and communities (Foley et al. 2020).

3   COVID-19 and Green/Blue Space

During COVID-19, innovative work is emerging, both because and in spite of reduced or restricted access to nearby nature. The primary modes of COVID-19 transmission are direct contact with an infected person or their respiratory droplets

(WHO 2020). Urban design greatly influences the degree of interaction between people as the agglomeration of housing, economic, and services activities in specific areas causes population concentrations in small sections of the space (Duarte Pinheiro and Nuno Cardoso 2020). Different strategies to reduce the spread of COVID-19 and the risk of transmission have led to the closure of services such as parks, playgrounds, and picnic or outdoor exercise areas, limiting the possibilities of access to green/blue areas in many cities (Freeman and Eykelbosh 2020). The COVID-19 pandemic has caused a change in behavior patterns, increasing the population's awareness of the importance of green/blue spaces (Rousseau and Deschacht 2020). Quarantine is associated with increased psychological distress, post-traumatic stress disorder (PTSD), depression, and generally higher levels of stress (Brooks et al. 2020). Contact with urban nature can offer people the opportunity to escape from domestic confinement and enjoy its positive effects (Samuelsson et al. 2020). COVID-19 is an opportunity for urban planners to release more space on the streets for pedestrians and cyclists, moving toward greener cities (Honey-Roses et al. 2020).

Emergent research by medical/health geographers has focused on social inequalities in access to nature for health promotion, highlighting disparities and differential health outcomes across places and spaces (Bambra et al. 2020). As people follow the daily reporting of deaths/cases at global level using geospatial visualization tools, they recognize something health geographers have always known; that spatial variations in mortality and morbidity occur across multiple scales, are persistent, and discriminate against the vulnerable in most societies (Brown et al. 2017; Johns Hopkins 2020; Kamel Boulos and Geraghty 2020). Although the population group most at risk from COVID-19 are the elderly, those with certain underlying medical conditions and other risk factors such as ethnicity and socioeconomic deprivation highlight important health inequalities (Clark et al. 2020; Wang and Tang 2020). There are embedded structural reasons why ethnic, indigenous, and other marginalized groups in societies have been disproportionately affected. In the United States, deaths due to COVID-19 are disproportionately high among African Americans compared with the population overall (Van Dorn et al. 2020). Other vulnerable groups include people with low incomes, poorer education, and less access to healthcare and nutritious food (Galea 2020). From a specific green/blue space perspective, there are clear social class gaps in terms of access to green/blue spaces; new detailed maps of green/blue space provide a useful initial base to help identify availability as a specific spatial component (Fields in Trust 2020; Jassi and Dutton 2020). There will be a specific need for work that uses innovative geocomputational analysis, modelling, and visualization to link disease geographies with resource availability, taking advantage of innovative data science for multilevel and multi-scalar analysis (Franch-Pardo et al. 2020; Garrido-Cumbrera et al. 2018). A quantitatively framed relational geography of health and well-being, using a spatial overlay approach, can model where green/blue spaces "fit" against geographies of certain vulnerable populations and groups based on known characteristics linked to housing and deprivation (Bambra et al. 2020). Such overlays can consider at local

geographical scales how significant socioeconomic status (SES) can be in relation to COVID-19 cases and deaths (Rojas-Rueda et al. 2019).

Accessibility to and utilization of green/blue spaces also inform ongoing work by health geographers on COVID-19. Using a range of qualitative methods, researchers from the GreenCOVID study in Spain, England, and Ireland as well as researchers in the United States and other countries are exploring complex relational geographies of how people perceive, use, and value green/blue space during lockdowns (AGE 2020; University of Winchester 2020; University of Michigan 2020). While generating valuable information on individual health and well-being, individual surveys identify how and where people have lived through lockdown and how different relational elements (housing, family supports, views, and built environments) have shaped lack of access and thwarted utilization of natural spaces. Methodologically, longitudinal work and other cohort studies take advantage of regularly collected data waves to extend to spatial associations with green/blue space (Astell-Burt and Feng 2019; Rojas-Rueda et al. 2019). Such research is already underway in Ireland using the latest fourth wave of TILDA (a national survey for people over 50), while regular annual surveys such as the Health Survey for England and EU-SILC are already beginning to hint that access to nearby nature is more important for poorer people (Dempsey et al. 2018). In Spain, the Institute of Statistics and Cartography of Andalusia has recently released a regional survey on habits and living conditions during the lockdown (IECA 2020). Ongoing survey work may also explore variations in access between private and public green/blue spaces, a topic ripe for further examination given differential health outcomes during the COVID-19 pandemic (Fields in Trust 2020; Jassi and Dutton 2020).

Beyond the academic world, the COVID-19 pandemic has seen an explosion in citizen cartographies of health; mapping out nearby nature is a common outcome of the spatial confinement brought on by the pandemic (Bliss and Martin 2020). We are seeing such "mappings" emerge as a process/tool to manage increased stress and anxiety yet also provide a re-sensing of the value of exposure and contact with nature (Bell 2019; Clavin 2019; Foley et al. 2020). Emergent themes such as "natural callings" and "psychic landscapes" show complex differential "affects" emergent within and between places as emotions, anxieties, and well-being have been negatively affected during the lockdowns (Holmes et al. 2020). In exploring how and why people used specific spaces during lockdown, one can begin to identify enhanced values and meanings. Will they linger or stick/accrete into daily practices post-lockdown or provide renewed foundations for a stronger citizen valuing of green/blue space? Those new mappings also show the importance of the senses and enhanced access to them in quieter and more open spaces of sight, sound, smell, and touch (Bell et al. 2018). In tandem, renewed awareness of the value of green/blue spaces is equally evident in research on the impacts of pollution and climate change on those same resources, referencing Australian bushfires immediately pre-COVID-19 and the evident reductions in air pollution early in the pandemic (Rousseau and Deschacht 2020). There are already discussions on how COVID-19 will reshape planning, architecture, and built environments and provide opportunities for green/blue spaces care and conservation, simultaneously recognizing the

need to design them more effectively in new developments for enhanced societal health and well-being (Scott 2020).

4   Post-COVID-19 Assemblages of Green/Blue Space

In a recent essay on subjective well-being, Atkinson (2020) argues for a relational approach that moves beyond a toxic individualism to a more "wholesome" tonic linking social, communal, and networked assemblage of care. This translates readily onto ways in which green/blue spaces have been used during lockdowns to produce more hopeful senses of community and shared well-being. COVID-19 has made us increasingly aware of this in relation to green/blue space as wider dimensions of built environments, class, ethnicity, and public policy are shaping very different health outcomes for affluent and deprived populations across the globe. While some dimensions of health-enabling green/blue space are common, important socioeconomic and cultural variants around weather, ownership, practice, prohibitions, embodiments, and shared living spaces also exist (Groenewegen et al. 2012). Duff (2011) notes that therapeutic properties of place are relational achievements, produced by the unique convergence of enabling resources in place. We are living through a unique global and societal moment that emphasizes and revalues the importance of green/blue spaces providing a unique natural resource in multiple places and forms. While the utilization of green/blue space is shaped by family, gender, and work/social balance, a wider geography of care is also evident in the creation of dedicated access for older and medically vulnerable populations (Morrow-Howell et al. 2020). Here ironically, prohibitions of access for positive purposes for one group (older people) work by the exclusion of others (children and families).

In forming new appreciations for green/blue space, it is important to consider divergent aspects of that experience, simultaneously close-in/experiential and distal/structural. Green/blue spaces allow the citizen to satisfy basic daily needs such as leisure, recreation, and physical activity. At the same time, these spaces allow for the improvement of well-being through contact with nature, tranquility, spirituality, or personal reflection, which are essential for psychological relief, especially relevant in these times of uncertainty, economic collapse, travel restrictions, and diminished social contact. Therefore, the COVID-19 pandemic offers green/blue space researchers' new perspectives, directions, challenges, and opportunities, specifically around methodologies and policy intervention. Given the difficulties of doing grounded research during lockdown, we might give fuller agency to public and citizen science findings and perspectives as well as more clearly artistic and affective accounts. Publishing through preprint articles provides opportunities for health/medical geographers to flag up preliminary findings from national and local surveys on impacts, home environments, and health outcomes and contribute to multidisciplinary research (Holmes et al. 2020). Research on ecosystems services and natural capital tends to focus on a quantifiable value for green/blue space that's helpful but

can often drive discussions in a specific direction (Bratman et al. 2019; Bullock et al. 2018). There are other ways of valuing our nearby green/blue, including fuller recognition of access, rights, and care that can challenge existing cultural understandings. The impact of COVID-19 has forced a stripping back on immediate home environments and emphasized the importance of green/blue as spaces of respite. How do we societally measure a renewed appreciation of natural spaces to ensure a more holistic identification of their functional properties as wider therapeutic assemblages? Finally, measured health and well-being outcomes on the differential impacts of green/blue space mirror other markers of inequality around deprivation, ethnicity, or chronic illness. They emphasize the social and spatial components of the pandemic's impact in terms of environmental justice and provide a clear route for action for future research on green/blue spaces for health geographers. The reduction in economic activities and mobility caused by the pandemic must be seen, not just in terms of its negative effects such as reduced GDP or increased poverty but also as an opportunity to restore the natural environment, a new inclusive and green economic model, and enhance the salutogenic value of green/blue spaces while reconnecting people with nature.

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Chapter 38
COVID-19 in the Developing World: Curse or Blessing?

Susan Elliott

Disclaimer: It is well known that I am a glass half full sort of person. Others may not see the *blessing* aspects of the virus, but in reflective moments, I see at least three. First, this pandemic has made me a better global health researcher and a better health geography teacher. Second, this global pandemic has shone a spotlight on health as a social science, which is what health geographers and other health social scientists have been preaching for some time (Wilkinson 1996; Elliott 1999). And third, this global pandemic has shone a spotlight on existing inequalities in health and wellbeing that *might possibly* result in changing dynamics in access to health-related resources post-pandemic, thus facilitating pathways to the Sustainable Development Goals (SDGs) (UN 2015a), and hence global health and wellbeing.

As a global health researcher with a major focus on WASH (water, sanitation and hygiene), this pandemic could not hit any closer to home. In the early days, we were told that the best way to stem the spread of the virus was to wash our hands frequently with soap and water. In most parts of the world where I work (Sub-Saharan Africa, Southeast Asia, parts of Latin America) there is no water. And in many parts of those worlds, the water one has access to is not safe or clean and just to be clear; washing your hands in dirty water with soap does not make them clean. Indeed, approximately 2.9 billion people lack access to safely managed sources of water around the world and 4.5 billion people lack access to safely managed sanitation services (WHO and UNICEF 2017). Disparities in access also exist across spatial scales (household, community, national, regional, global). For example, 58% of those who use surface water sources for consumption live in sub-Saharan Africa (WHO and UNICEF 2017). Within countries in these regions, further disparities exist based on socioeconomic status (rich vs poor) and geographic location (urban vs rural) (Dora et al. 2015).

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We cannot ever talk about water without also talking about sanitation. In this vein, open defecation is often the alternative to limited access to sanitation facilities, and this has negative impacts on the environment as well as local water supplies and spread of water-related diseases (WHO 2019). Lack of toilets and poor management of waste from toilets cause transmission of diseases like cholera, as well as psychosocial stresses, adolescent female school dropout, and women's safety and privacy (Abu et al. 2019). According to the WHO/UNICEF Joint Monitoring Program for Water Supply, Sanitation and Hygiene (JMP), 673 million people around the world practice open defecation. The lack of access to toilets is more prominent in rural areas and two-thirds of people without sanitation services live in developing countries. The lack of access to safe water, sanitation, and hygiene exposes many already vulnerable populations to preventable waterborne illness such as cholera, hepatitis E, and diarrheal diseases. The lack of access to water also has negative impacts on education as limited access to WASH leads to an increase in dropout rates, lateness, and absenteeism (Jasper et al. 2012); children often arrive late or are absent from school if they have to collect water or if they have to watch younger siblings at home while their mothers go to collect water; this eventually affects academic performance (Jasper et al. 2012).

Furthermore, there are significant and seemingly insurmountable gendered aspects to the water, sanitation, and hygiene (WASH) issue. For example, women and girls are primarily responsible for collecting water for their households, leading to loss of productive time and calories (Bisung and Elliott 2018). In their role as primary water collectors, they are also subject to not only a range of waterborne illnesses but also violence (structural, physical, sexual, psychosocial), disproportionately impacting the gendered aspects of WASH vulnerabilities. Who knew something as simple as water could affect so many aspects of the human condition?

> *Plumbing poverty is produced through the conditions of infrastructural violence – the slow burn of water insecurity that negatively affects human life and capacity for human development* (Deitz and Meehan 2019: 1106).

These issues affect not just families and households. The WHO/UNICEF joint monitoring program reports that in sub-Saharan Africa (SSA), only 51% of healthcare facilities have access to basic water services and 23% have access to basic sanitation services. In a 2018 review of 78 Low-to-Middle Income Countries (LMICs) by Cronk and Bartram (2018), they found that only 2% of the healthcare facilities provided water, sanitation, hygiene, and waste management services.

July 28, 2010, the UN declared water a human right (UN 2015b). A full decade has passed. This global pandemic has shone a spotlight on the lack of access to WASH for a large proportion of the world's population, and hence the lack of a basic public health tool *necessary* to stem the spread of this (or any other) virus. As a global health researcher, I came to the conclusion many years ago that *all health is global health*. This is implicit in the COVID quote from the UN Secretary General, Antonio Guterres, that: we are not safe until everyone is safe (UN 2020). But lest we think this applies only to the *developing world*; consider Canada where 1% of the population (a small percentage that translates into a large number of human beings)

continues to lack access to safe water and sanitation in the face of a global pandemic virus. This 1% represents primarily the Canadian Indigenous population, already marginalized due to the legacies of colonialism (Fig. 38.1).

In the USA, similar inequalities were uncovered in the early days of the virus (March 2020) when it was discovered that poor, inner city households were living without water and sanitation facilities due to their economic status; that is, their water had been cut off by privatized water companies because they were too poor to pay for their water (Lakhani 2020). This translated into over 60 million low income households. Middle income countries are not immune. Recent research on irregular settlements in the posh hotel zone of Cancun, Mexico, for example, reveals low or no access to safe water, sanitation or even electricity (Hall et al. 2020).

Over the past approximately 12 months, a surprising finding for many of my global health colleagues has been that the *direct* impact of the virus on populations in sub-Saharan Africa (SSA) (cases; mortality) has not been as devastating as we
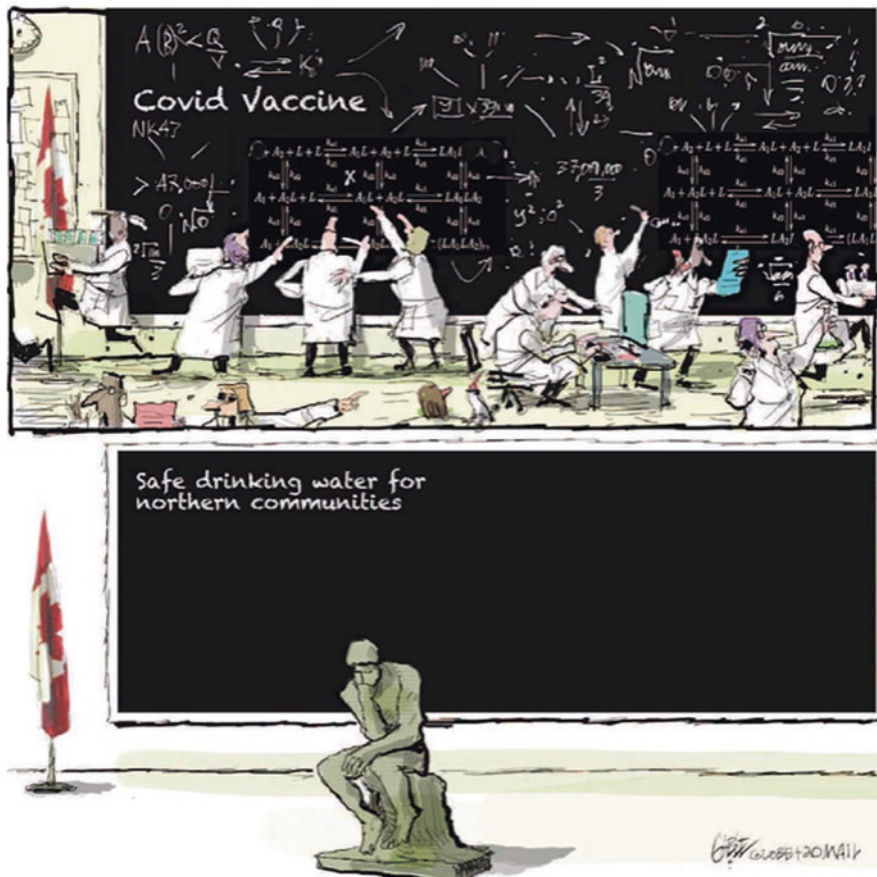

Fig. 38.1 Editorial cartoon, *Globe and Mail*, December 4, 2020

initially thought may unfold. There are a number of potential explanations for this, most of which are speculation based on years of service in this research area. The first is that these populations are used to dealing with infectious diseases as they remain a significant cause of morbidity and mortality in these regions. The second is the lack of health service infrastructure that is most likely affecting basic testing and surveillance activities. The third is the trope of corruption—those in positions of (decision making) power ignoring public health messages for reasons of personal gain. The fourth is yet another trope—that of ignorance of the basic science of health determinants and impacts in the general population, resulting in the attribution of ill-health experiences to meta-physical phenomena (God's will; witchcraft). At the same time, we see countries with unstable political systems using the veil of a global pandemic to cloak local militaristic (style) take-overs and/or civil unrest happening with very little global (media) attention (e.g. Ethiopia, Uganda). We know that where there is civil unrest, morbidity and mortality rates climb due to unstable health infrastructure and decreasing access to basic necessities of life such as food, water, and shelter.

While the *direct* impacts of the virus have not yet been widely reported in much of SSA and other developing nations, many feel the writing is on the wall and it's just a matter of time. In the meantime, the *indirect* effects of the virus are garnering little attention globally. For example, out of 2020 we will see significant increases in miscarriages, stillbirths and infant mortality due to lack of access to prenatal care, transportation to health care centres and access to essential services for women in need. Much of our information around these issues comes from two sources: first-hand reports from our friends working on the ground and mathematical, predictive models. In the context of the first, my colleague/friend reported this story to me: imagine being a birth attendant in a health care centre in rural Uganda where you spend the morning delivering six babies, every one of them still born; this was week 1 of the lock down. With no public transportation available, women waited until the last minute then spent precious money on private transport to a health centre to endure this outcome. Job loss, food insecurity, loss of home and shelter, the list goes on; for example, Busch-Hallen et al. (2020) predict that a high risk scenario could result in almost 150,000 child deaths across 129 low and middle income countries (LMICs) over a 1 year period—plus additional morbidity—as a result in reductions in the prevalence of breastfeeding due to COVID-19 disruptions. Significant reductions in lifesaving vaccinations due to travel restrictions and interruptions in the supply chain will also result in significant increases in childhood morbidity and mortality due to diseases that should now only reveal themselves in the history books. For example, Robertson et al. (2020) modelled increased childhood mortality and morbidity as a result of the indirect effects of COVID-19 (Fig. 38.2). The predictions are sobering and the effects, multi-generational.

Some countries (e.g. USA, Ghana) have taken steps to ensure access to safe water during the pandemic. Can we raise awareness in the developed world that global access to safe water and sanitation means that I am going to have greater protection in my high-income country from the global spread of a pandemic virus? Can I convince my health geography students that all health is global health? I feel

Fig. 38.2 Baseline and additional maternal and child deaths per month by scenario (Robertson et al. 2020)

my chances of doing so are heightened by the fact that these young people have first-hand experience of the causes and consequences of a global pandemic. Can we encourage these countries that have taken action on water and sanitation to keep this going beyond the pandemic? This left-field application of the UN Human Right to Water would result in incredible progress towards not only SDG 6 (water and sanitation for all by 2030), but also SDG 5 (women's empowerment) and SDG 3 (health and wellbeing for all).

There is of course another side to this coin, and that is access to treatments and vaccines for the COVID-19 virus, once developed. At time of writing (early

December, 2020) the first vaccine has just been approved by a national government—the UK (Isaac 2020). This trajectory has indeed happened at 'warp speed' but the rollout will again shine the spotlight on existing global inequities; indeed, it already has. There are several more vaccines on the cusp of approval at time of writing (Chung 2020), and the hope is herd immunity within the next 6 months or so—in the developed world. What will happen in the developing world? There are two significant barriers to global availability of vaccines and treatment. The first is vaccine nationalism; that is, countries will want to vaccinate their own populations first in order to restore their own economies. The essential problem of course is that developing nations do not have the internal capacity to develop and/or manufacture their own vaccines so they are reliant on the kindness of others; they will stand at the back of the line. Even some wealthy countries are challenged in this vein; my own country—Canada—has the internal capacity for development (Chung 2020) and a couple of our vaccines are well supported by federal funds for development, but we have no internal capacity for manufacture. As a result, Canada has purchased ten times the amount of vaccine required by our population—in essence, we are hedging our bets. While we will not be the first in line, we will not be far behind.

And then there are Trade Related aspects of Intellectual Property Rights (TRIPS) held by the World Trade Organization (WTO). Essentially, this means that those who invent treatments and/or vaccines retain those intellectual property rights—that is, the patents - over those discoveries and therefore can charge whatever the market will bear without the possibility of sharing the formula or recipe with others who could produce, for example, generic brands of the same vaccine and/or treatment. The bottom line: global health or private profit? A similar situation occurred in the context of HIV/AIDS when the WTO was challenged on TRIPS for treatments which were costing upwards of $10,000 annually. When successful, the challenge resulted in a reduction of these costs to approximately $300 per year, and the savings of hundreds of thousands if not millions of lives (Sihanya 2005).

In the current context, South Africa and India have asked for a TRIPS waiver to ensure equitable access to COVID-related diagnostics and treatments until a conclusion to the pandemic is declared by the WHO. Member countries of the WTO have been asked to support them in this bid to attain herd immunity in LMICs. The vote will happen December 10th, 2020 and requires 75% in favour or else this will not happen and LMICs will have to stay at the back of the line: global health vs private profits.

The pandemic has galvanized the opportunity for the health geography community to expand our commitment to inequalities and our research repertoire to engage with global health (Elliott 2017); all health is global health. Specifically, we need to expand our interests in the social determinants of health to other parts of the globe, particularly developing nations facing a very different context for the experience of COVID-19. In so doing, we need to inform our work theoretically, perhaps drawing more broadly and critically on (feminist) political ecologies of health. Finally, we must be more mindful of the translation of the knowledge we are creating. To be clear: we are not advocates, we are researchers. We cannot, in my view, advocate on behalf of the populations and communities we research without overstepping our

boundaries and/or losing our credibility. We can, however, come alongside those populations and communities using integrated knowledge translation methodologies informed by allyship in such a way that we advocate not for them, but for the evidence. That evidence can then be used by those populations and communities to effect relevant change. Through this process of bearing witness, health geographers will not only have an impact, but potentially make a difference.

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Chapter 39
Art-Spaces

Check for updates

Sarah Atkinson

The constraints imposed by lockdown over the spaces for everyday life have disrupted our activities, interactions, and self-expression. Although this spatial disruption may generally be beneficial, harmful or neutral to wellbeing, there is widespread concern of potential and substantial negative effects in the specific context of the pandemic. While this is a global phenomenon, this chapter will largely draw on the experiences in my own country, the United Kingdom (UK), where governments, health agencies, and a plethora of online sites issued advice for self-managing and maintaining personal wellbeing. Exhortations nearly always include suggestions for engaging with the creative arts and for learning a new skill. For geographers, these two pathways to self-management of wellbeing partly overlap given calls to take a broad conception of the arts that includes skilled crafts (Hawkins 2018). Geographers have critiqued the hyper-individualized and often internalized conceptualization of wellbeing in circulation (Atkinson 2020) and, instead, treat our spaces of wellbeing and health as inherently relational and situational assemblages (Atkinson 2013). The disruption of wellbeing assemblages, and the restorative potential of arts and artistry, intersect geographical debates including the relation of the individual and the social (Atkinson et al. 2020); the blurring of discrete spaces of home, public, leisure and work (Easterbrook-Smith 2020); the nature of representation (Anderson 2019); and the interface between arts and digital technologies (Hunt and Atkinson 2019).

The creative arts and crafts, for participant or spectator, may enable the exercise of expression, emotion, imagination, education, and communication and expand the spaces and times that we meaningfully inhabit. A recent comprehensive review, commissioned by the World Health Organization (WHO), establishes the widespread benefits to health and wellbeing in relation to both prevention and promotion

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and management and treatment that are associated with the arts (Fancourt and Finn 2019). Much of the literature focuses on the individual benefits that may arise from a re-imagining of identity, capacities, and possibilities. There is, however, limited exploration of the pathways mediating engagement and benefits. The exceptions include geographers, exploration of spatialized processes relating to various forms of temporary disruptions to everyday assemblages, which intimate potential debates opened up by spaces of arts and crafts in lockdown. These include: decontextualization through an interior psychological locatedness that enables "a temporarily all-consuming occupational space" (Parr 2006, p. 155); contextualized recognition by oneself and others in response to the art produced (Tan and Atkinson 2019); recontextualization through the destabilization of a wellbeing assemblage and explorations of new relational constellations (Atkinson and Scott 2015).

The arts sector in the UK has responded rapidly to the needs and opportunities of the pandemic lockdown (see e.g., BBC Programmes 2020). A relatively conventional offer shifts normal business online, including virtual access to galleries and museums (Feinstein 2020); resources for arts and crafts with children (BBC Bitesize 2020); and streamed live performances, albeit lacking the vibrancy of a live gig (Clapp 2020). Entertainment at home through the consumption of streamed media has hugely boosted the fortunes of digital providers, such as Netflix (Thomas 2020). These offers align with advice for enhancing personal wellbeing through individual arts and crafts engagement. Other emergent spaces indicate that the benefits of arts and crafts can go far further. One art-space experiencing huge growth is the youth platform TikTok, whose success as an online space of creativity may reflect the combination of fun, physical activity, creative flexibility, and social communication (Kale 2020). The timely offer of Netflix Party has enabled socializing at a distance through synchronized viewing and commentary of shows and films (Heritage 2020). Greater exploration of cooking, and particularly the somewhat artisanal activity of baking bread, has also emerged as a popular trend. While this is a craft good for occupying children, it also expresses all kinds of interesting social and spatial relations that blur leisure and work-spaces, class, and other forms of social recognition (Easterbrook-Smith 2020). The combination of arts and online platforms have also enabled a collective sense of wellbeing through visual and verbal imagery by, variously, sharing sorrow, and loss (BBC News 2020), celebrating key workers (BBC Music 2020) and dreaming of hopeful futures (350.org 2020). The hybrid, interdisciplinary field of geohumanities has coalesced around emergent and interrelated strands of research on creativity, arts, and artists on the mobilization of digital technologies and on a constellation of emotions, affects, embodiment, and atmospheres (Dear et al. 2011). There has been, however, a separation between those working with data and digital technologies, and those working with creativity, practice, and performance (Hunt and Atkinson 2019). The increased dependency for connection to worlds outside the home on the mediation of digital technology and online spaces erodes this division and pushes the geohumanities towards merger of its sub-areas.

The offer of spaces that merge arts, crafts, and digital technologies privileges visualization and sound to the almost total exclusion of other senses. The particular influence of visual imagery is well recognized, and, in comparison to words, results

from the ease of accessing information and the greater likelihood of remembering images, both related to the speed at which the brain processes images. This advantage for getting messages across to target audiences is well known by the marketing industry and public health messaging has exploited this potential during the pandemic (see, for example, the hand-washing sing-along for young children with the popular character Peppa Pig by WHO 2020). The power of visual images can, however, also exacerbate existing disadvantages and promote new difficulties. The pandemic has spawned a rapid increase in related misinformation, fake news, and conspiracies, often involving images or videos mislabelled or manipulated (Brennan et al. 2020). Similarly, imagery and sound can be used through social media platforms to accuse and shame making some feel as if they are under constant surveillance (Noor 2020).

The geohumanities and related strands of health geography have emphasized attending to the lived and differentiated experiences of health and ill-health. The interactions of visual imagery, words, and sounds with experience varies from reflecting, capturing, or exploring experience through to mediating, shaping, or even determining experience. Anderson (2019) calls for geographers to recognize the 'force' of representations and, rather than merely examining what representations stand for, to ask explicitly what work they do and particularly as part of 'relational configurations' that shape inequality. Artists have taken inspiration from and responded to the pandemic through conventional forms, including street art (The Guardian 2020a). Street art has an ethos of offering provocation, reflection, or political commentary on the issues of the day, often through humour and a sense of the carnivalesque (Mitman 2020). The COVID-19 street art continues this by celebrating the front-line workers (see Ford 2020 for Banksy's 'Game Changer'), mocking politicians (see Scooj 2020 for spoofing Trump's disinfectant advice) or reflecting on wider popular experiences such as panic buying or home schooling. Mitman (2020) argues that the interaction of street artist, audience, time, place, and transgressions of usual social structures and hierarchies may provide "momentary respite from … the psychological weight of the global COVID-19 crisis." Arts-spaces reveal their political potential and the force of representation further through new creative and arts-related responses to the pandemic. The wide reach of digital media facilitates arts-based political messaging; the poem in the UK 'You Clap for Me Now' flags the hypocrisy of applauding key workers while espousing anti-immigrant sentiment given the extent of overlap between these categories (The Guardian 2020b). The emergence of the Black Lives Matters (BLM) movement during the pandemic following George Floyd's death responds to racialized inequalities which include the high mortality rates from COVID-19 in Black and minority ethnic (BAME) communities. Part of the BLM demand for a more comprehensive and inclusive account of history questions how art encounters history, experiences, and values through the debate over public statues of eminent historical figures involved in the differentiated lived experiences of wellbeing, or the lack thereof, during the slave-trade. Finally, the economies of the pandemic reveal and produce inequalities in which there are winners and losers. Streaming platforms, such as Netflix and TikTok, have seen a significant growth in business. Basic cooking ingredients such

as flour and yeast sold out fast in many countries, including the UK, and were in short supply in shops for some weeks at the start of the lockdown. At the same time, lockdown may exacerbate the recognized precarity of creative and cultural work bringing economic stress for performing artists and performance venues (Comunian and England 2020). Summer music festivals, now cancelled, normally constitute the key earning season for many musicians (von der Brelie 2020) and performance venues already operating with small profits will struggle to reopen (Sweney 2020).

This short exploration of the spaces of arts and crafts during the 2020 pandemic reveals how the tendency only to attend to the benefits to individual wellbeing from individual engagement limits our understandings of art, crafts, wellbeing, connection, inequality and history. The radically spatial changes to everyday living during the pandemic present geographers with an imperative to bridge substantive, conceptual, and policy approaches that have tended to be differentiated across the subject, including creative geographies, cultural geographies, geohumanities, and digital geographies. The pandemic has shown a need for research in the geographies of health and wellbeing that can bring a broader attention to the differentiated and ambivalent possibilities of arts-spaces. This might explore how the creative industries are changing and under threat from the pandemic. It may explore arts-spaces as not only beneficial for personal resources and collective meaning-making but also as supporting confusion, division, and conspiracy, and contributing as much as countering the continued production of inequalities. Geographies that explore the relationships between arts, crafts, health, and wellbeing through frames of assemblage, the force of representation and spatial hybridity with digital technologies have much to contribute to an expanded understanding of the potential of art-spaces.

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Part IV
People

Chapter 40
Practicing Self-Determination to Protect Indigenous Health in COVID-19: Lessons for This Pandemic and Similar Futures

Chantelle Richmond, Heather Castleden, and Chelsea Gabel

1 Introduction

Among Indigenous[1] populations across the globe, land is centrally important to their health and wellbeing as it provides the place upon which Indigenous Knowledge (IK) is conceived and practiced. Our research (e.g. Castleden et al. 2016; Gabel et al. 2016; Richmond 2018) and the scholarship of other Indigenous and settler geographers show clear connections between Indigenous land, language and knowledge creation. Anishinaabekwe activist-scholar, Winona LaDuke (1994) describes IK as "the culturally and spiritually based way in which Indigenous peoples *relate to their ecosystems and with one another*" (p. 127, emphasis added). IK systems are the basis of these relationships, forming Indigenous ways of living that are healthful and nurturing (McGregor 2004). While the link between healthy lands and healthy people is only coming to light in dominant (western) scientific discourse, it has been known, embodied, and taught in Indigenous contexts for millennia (Castleden et al. 2016).

European colonization has marginalized Indigenous peoples from their traditional homelands, cultures, ways of living, and knowledge systems. These

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[1] We use the term "Indigenous" to refer to the inhabitants of land predating colonization.

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experiences pervade the contemporary Indigenous health profile, leading to shorter life expectancies, greater burdens of chronic and infectious disease, greater risks of experiencing violence, and death by suicide at rates that far exceeds patterns in non-Indigenous populations (Gracey and King 2009). The discipline of Geography has played a central role in shaping ongoing colonial systems, structures, policies, and practices of politics, economy, education, and health as well as research (Sylvestre et al. 2018).Indigenous peoples, however, are not mere victims in their experiences of colonization, racism, and dispossession.

Indigenous and allied scholars in and beyond the academy have contributed to the development of a research paradigm that supports collaborative research with Indigenous populations to revitalize knowledge systems, connection to the land, and improved health and wellbeing (Tobias et al. 2013). Within human geography, an important theoretical development relates to the geographies of Indigenous health (Richmond and Big-Canoe 2018). Informed by the fields of health geography and Indigenous geographies, this subdiscipline seeks to understand how Indigenous people's health and wellbeing is impacted by colonial structures and processes as well as features of their local environments. The geographies of Indigenous health support a critical methodological imperative that centres Indigenous community concerns about health and the land.

Here, we examine Indigenous experiences of COVID-19 in the Canadian context. Building from an approach that amplifies Indigenous community capacity to address health issues (see Hyett et al. 2019), we place emphasis on concepts of self-determination and land stewardship. At the same time, we are mindful of the ways in which processes of structural colonialism and dispossession create vulnerabilities for some segments of the Indigenous population (e.g. urban, Elders, the carceral population). COVID-19 not only places Indigenous peoples at higher risk in terms of its human health impact, but also intensifies risk for Indigenous languages, cultures and knowledge that are central to the next generation (Gabel et al. 2016).

2 Indigenous Experiences of COVID-19 in Canada

At the broadest level, the social, economic, and environmental conditions of many Indigenous communities in Canada place First Nations, Inuit, and Métis peoples at high risk for contracting COVID-19. Several generations of exposure to settler colonialism and racism have led to Indigenous peoples having a lower life expectancy than the Canadian population. They are more likely to live in poverty and/or be homeless, and many live with underlying health conditions. Overcrowding of households, food insecurity and access to clean drinking water are critically important issues for many. These public health inequities leave Indigenous communities susceptible to COVID-19 outbreaks, such as that which occurred at La Loche, a Métis community with a population of 2830 where 180 people tested positive for COVID-19. Because of the overrepresentation of Indigenous people in prison, again due to systemic racism in the justice system, it is likely that COVID-19 will be

disproportionally fatal to Indigenous peoples in corrections, where testing is voluntary. This demonstrates yet another arena where Indigenous peoples shoulder the brunt of inequity. COVID-19 adds yet another layer of complexity.

Still, COVID-19 incidence amongst Indigenous peoples living in Canada has been, to date, relatively low. There are two possible interpretations to this paradox. The first and most hopeful is that Indigenous peoples are not 'victims' in their experiences of inequity. Since March, the federal government has made $1.3B available to Indigenous communities to support COVID-19 efforts. Impressive-sounding, but the reality is that this money is woefully inadequate to address Indigenous needs amidst the pandemic, let alone the health, economic and social infrastructure that is lacking in so many communities. As such, many have taken matters of protection into their own hands. We note several examples here.

3   Self-Determination

Less than a week after the province of Ontario 'shut down' in March, Biigtigong Nishnaabeg, a small Anishinaabe community in Northwestern Ontario passed a Band Council Resolution declaring a state of emergency and implementing its own COVID-19 Bylaw. Practically, this meant that a guarded barricade was placed across Highway 627—the only road that leads into and out of the community—thereby closing the community to those who did not live there. Nearly 3500 km to the west of Biigtigong, the Huu-ay-aht First Nations Government was enforcing its own modern treaty through its Land Act that establishes no one is permitted to do anything on Huu-ay-aht Treaty Lands that may constitute a danger to public health (Fig. 40.1). Thus, entry into their community was restricted; only non-residents who provide essential services or who do not pose a danger to public health are permitted.

Due to the jurisdictional ambiguity between provincial and federal levels of government support with respect to the Métis, there has been no plan, no resources, no programs and no supply chain. Thus, the Métis took it upon themselves to purchase Personal Protective Equipment (PPE) and other medical supplies for their communities. Prescriptions and food are delivered directly to Elders' homes, and monetary support has been made available for those who are in need. Mobile tiny homes are available for emergencies where families or family members needed to self-isolate.

In the North, Nunavut, covering over two million square kilometres and home to over 28,000 Inuit, remains COVID-free at the time of our writing. Looking to the East, Neqotkuk (Tobique First Nation) immediately began providing vulnerable people in its community with hand sanitizer, masks, and more extreme measures that focused direct attention on protecting the community's 135 Elders. Native Friendship Centres across the country are supporting the needs of urban Indigenous peoples and responding to a 200% increase in requests for assistance. They are supporting women and children who have sought refuge from domestic violence, providing emergency care package of food, personal care items, and diapers.

Fig. 40.1 Guarded gate at Biigtigong Nishnaabeg, March 23, 2020. (Photo by Juanita Starr)

4 Vulnerability

The flip side is that we are not seeing the whole picture. No one knows for certain how many Indigenous cases there are due to a lack of rigorous public data. Tracking COVID-19 in the Indigenous population remains one of the greatest challenges to understanding the breadth, scope, and impact of this virus. When it comes to collecting Indigenous specific data about COVID-19, only First Nations peoples living on-reserve are accurately captured because they fall under the jurisdiction of the Government of Canada.

The collection of data for all other Indigenous populations, including those living in Métis and urban communities, is the responsibility of provincial/territorial public health authorities, which do not require individuals to self-identify when testing. Less is known about how COVID-19 is presenting from a gendered perspective. At a time when anti-Black and Indigenous racial violence prevails in Canada, including in our healthcare systems, we wonder how these structures have impacted Indigenous peoples' access to testing and treatment, and what if any, culturally relevant supports are available for those who test positive.

5 Beyond the Pandemic: Protecting Future Generations

As we move through what many have deemed a 'new normal', everyday life around the world continues to be impacted and it is fair to say that some are impacted far more than others. Indigenous communities, whether urban, rural, or remote, have been on high alert and actively preparing for the worst. Immediate responses to shut borders and isolate communities have been vital to preventing the spread of COVID-19. But there have been costs. Traditional activities and ceremonies are

communal; how they are being conducted have, in some cases, changed, and in other cases, change has been resisted. Holding an election during a pandemic also poses serious public health risks. The state of food (in)security is of great concern as is mental health in terms of support available to those in need and in isolation. How families are dealing with overcrowding and social distancing in close-knit communities is another challenge, as is the educational resources needs of Indigenous students living in communities with little to no internet connectivity or space for study.

Indigenous self-determination has been essential for protecting communities from the imminent dangers of this disease. As we move through the complexities of this pandemic, the egregious reality of these social and economic disparities will not only remain but will likely worsen. And while media attention on matters like climate change, big oil, and other matters that directly challenge the health and human rights of Indigenous peoples have—for now—been silenced, but inequity and injustice remain. As a second wave is imminent, priorities should shift to include more resources (e.g. mental health supports, digital literacy training to connect Elders and youth, and access to timely and reliable public health information and data).

We cannot go back to the way things were; Indigenous communities require material and symbolic space as well as resources to make changes needed for an equitable world. Now is the time to turn to the innovation that arises from adapting to change in local surroundings, something that Indigenous peoples have been doing since time immemorial. Actions to date with respect to COVID-19, despite underfunding and lack of direction by government, demonstrate the capacity and skill of Indigenous people to be self-determining on all matters, not only in times of pandemic.

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Chapter 41
#thenewnormal and the Pathological: Rethinking Human–Virus Relations During the COVID-19 Pandemic

Beth Greenhough

As UK lockdowns persisted for weeks, and then months, COVID-19 shifted from being a global public health emergency to becoming #thenewnormal. The use of the term 'normal' is of particular interest to health geographers because it signals a changing relationship between humans and the COVID-19 virus, one which brings COVID-19's status as dangerous foreign pathogen into question. It is also a term which provokes for this geographer a return to the work of the Georges Canguilhem. Canguilhem is known for his attempts to question the common assumption "that 'normal' equals 'healthy' and that 'pathological' equals 'sick' or 'diseased'," (Philo 2007, p. 85). Of course, part of the appeal of a virus is that at first glance it seems easy to isolate the cause of the problem—the pathogenic agent—and separate the abnormal, infected body from other normal, healthy bodies. As Canguilhem (1991, p. 40) puts it, "to see an entity is already to forsee an action". Yet, as COVID-19 has shown us, dealing with viral infection is not as simple as it first appears—if indeed it does appear in the form of recognizable symptoms.

One of the features which makes COVID-19 such an effective pandemic agent is that those infected can remain presymptomatic for up to 14 days and still be contagious. The lines between the normal (uninfected) individual and the individual who has contracted COVID-19 are blurred. This, perhaps, is the starting point for #thenewnormal, our inability to distinguish between human and virus, infected and uninfected, healthy and sick, normal and abnormal, and the anxieties this provokes. *As Canguilhem argues, our understandings and of what constitutes 'normal' are subjective and socially situated*. More specifically, the COVID-19 outbreak

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demonstrates how we (at least in the West) usually conceive of ourselves and our bodies as being uninfected or virus-free. This is, of course, an easily challenged assumption. Humans have co-evolved alongside viruses for millions of years, and many viruses remain part of daily lives in the West—the common cold, influenza, Herpes—but the implication is that the process of being infected is abnormal, a pathology to be treated or else concealed. In this chapter I draw on Canguilhem's work to examine the implications of the assumption made by Western medicine and politics that the 'normal' state of human bodies is to be uninfected, highlighting seven key points where this comes to matter and the implications of this for the biopolitics of pandemic response.

Firstly, assuming that to be uninfected is the norm retains an arguably unachievable ideal of being 'virus-free'. This ideal has a long history in the West, seen in the rise of the sanitary reform movement in England in the 1840s and culminating in the global eradication of smallpox 1980 (before being challenged by both the re-emergence of cholera and TB and the emergence of new pandemic diseases such as HIV/AIDS and SARS). This virus-free ideal then conditions human relations with nonhuman (microbial) others, what we might term 'microbiopolitics' (Paxson 2008; Greenhough et al. 2018). The disruption wrought by COVID-19 globally causes many of us to focus far more intently on microbial worlds which we usually remain blissfully unaware of. As Arundhati Roy (2020) writes in the *Financial Times*, "Who can look at anything anymore—a door handle, a cardboard carton, a bag of vegetables—without imagining it swarming with those unseeable, undead, unliving blobs dotted with suction pads waiting to fasten themselves on to our lungs?" Concerns over COVID-19 interface with popular antimicrobial discourse resulting in the conviction that the only way to be COVID-free is to be microbe-free. Consequently, many of the measures we take to protect ourselves from COVID-19—the use of bleach solutions and hand sanitizer guaranteed to kill 99.9% of all bacteria—are targeted indiscriminately at all forms of microbial life, even those which may be good (or at least not harmful) to us, actions which may in the long term also result in health complications (Lorimer 2017).

Secondly, to assume the norm is to be uninfected shapes how we imagine the bodies of others. There remains within Western populations a tendency to conceive of infectious disease as something brought across the borders of the nation state by 'abnormal', 'foreign' others, reproducing long held prejudices against non-Western populations (Farmer 2006). The resulting 'geographies of blame' (Farmer 2006; Sparke and Anguelov 2020) shape both national policies around the control of borders and the microgeographies of everyday interactions—seen for example in the harassment of people who showed traces of Asian heritage in the early days of the COVID-19 outbreak in the UK. Of course, such associations are not an exclusively Western phenomenon. Consider, for example, how in India the Hindu-Nationalist main-steam media has incorporated the threat of COVID-19 into anti-muslim discourse (Roy 2020).

Thirdly, assuming the normal body is virus-free causes us to underplay the role of other viruses, and other pathologies, in shaping experiences of COVID-19. COVID-19 is often referred to as *the* virus, as though all other viruses, (which remain largely a threat to geographically or socially distant others) no longer matter. We might reflect on how for many global regions COVID-19 is an unwelcome

additional burden on a population, economy, and culture already reeling from the impacts of other viruses, alongside social, political, and economic disturbances. On a more local scale those whose bodies did not already fit the pre-COVID-19 'healthy norm', described in catch-all terms like 'vulnerable adults' and 'those with pre-existing health conditions', found themselves both newly visible and simultaneously marginalized in the wake of the pandemic. Testimonies from those affected described how the caveat 'of underlying health condition' applied to each reported death made is seem as though somehow this death was more acceptable, effectively conflating the 'abnormal' and the 'pathological' (Canguilhem 1991). Significantly, as Clare Herrick (2020, no page) writes, "this language erases the politics of that vulnerability – the genesis of the conditions themselves – and creates a flat earth in which NCDs [non-communicable diseases like heart disease or diabetes] themselves do not emerge, do not have a cause, but rather are always already existing".

Fourthly, this politics of vulnerability shows how preconceived ideas of a normal, healthy body often fail to appreciate that lived bodies rarely conform to these norms, and that consequently the risks of infection are unevenly distributed. Hinchliffe and Law (2020), for example, describe the R, or reproduction number, epidemiologists calculate to indicate the number of new individuals an affected individual infects. As Canguilhem reminds us, such 'norms' are socially produced and contingent, and "can only ever be derived from measurements of particular people in particular places" (Philo 2007, p. 89). Consequently, R numbers can fail to reflect how "some groups, including many NHS staff, carers, delivery drivers, and frontline workers in supermarkets, are much more likely to be in virally meaningful contact with others" (Hinchliffe and Law 2020, no page). Similarly, Li (2020) examines how socio-economic status shapes the likelihood of both infection and diagnosis in Brazil, reflecting "unequal health in neoliberal society more generally" (Sparke and Anguelov 2020, p. 500; see also Herrick 2020). Furthermore, the emergence of 'one health paradigms' (Craddock and Hinchliffe 2015) reminds us that these vulnerabilities extend to more-than-human bodies, and we need to come to terms with how globalization, urbanization, and the neoliberalization of nature "have co-created the breeding grounds for all sorts of new pathogens, including other coronaviruses" (Sparke and Anguelov 2020, p.499).

Fifthly, then, it's not only human bodies which deviate from anticipated norms. A further set of norms arises around how we think about COVID-19 itself, and the ways in which it impacts and interacts with its human hosts. Here the 'normal' is sought through comparisons to other kinds of respiratory viruses, notably influenza. Symptomatically, COVID-19 shares many similarities with seasonal influenza, including fever, cough, fatigue and shortness of breath. Furthermore, the world healthcare community was already anticipating a flu pandemic, and many pandemic preparedness plans were modelled on influenza-type infections. Such comparisons arguably serve to 'normalize' the virus, and provide starting points for the development of vaccines and public health strategies. Yet these norms too carry risks. There remain many uncertainties around how COVID-19 spreads, the effectiveness of certain treatments and the possibility of developing a vaccine. Assuming novel pathogens will behave in similar way to those responsible for previous outbreaks can also serve to draw our attention away from alternative (and possibly stronger)

explanations (Hinchliffe 2001). Furthermore, comparing COVID-19 to other viruses serves to desensitize us to experiences of living with infection; experiences, Canguilhem argues, that are key to understanding the distinction between health and disease. Whilst the UK government reassures populations that the vast majority of cases will be mild by drawing comparisons to the common cold, testimonies from those who have experienced so-called mild infections describe significant and ongoing disruptions to their daily lives (Callard 2020).

Sixthly, norms are concerned not only with the presence or absence of disease, but its duration. When did it arrive? How long will it stay? Some countries have declared themselves COVID-free only to see outbreaks re-emerge. On a more domestic scale UK government advice suggested for the majority COVID-19 infection resulted in a 'mild illness' and a 'recovery period of around 14 days'. As Callard (2020, no page) observes, "these phrases point to an imagined punctual event with a fixed duration and a clear end," and yet "[a]s I write, I am in communication with many who have had 'mild'/'moderate' Covid-19 who have been feeling ill for multiple weeks". For others, who experienced almost no symptoms, there remains uncertainty as to whether the virus was present at all. Early in the pandemic this led to the demand for, and rapid development of, diagnostic tests, but this speed came at the cost of certainty, with questions being raised about the accuracy and effectiveness of many of the tests developed and the competency of those doing the testing. Such 'diagnostic uncertainties' are reflections, Street and Kelly (2020) suggest, not of the test's accuracy but rather of our heightened expectations of its ability to distinguish the normal and the pathological. Even with increases in the availability of testing, diagnosing an infection still largely depends on an individual recognizing that they are showing viral symptoms and seeking out a test. This returns our argument to the Canguilhem (1991, p.40) quote with which we opened: "to see an entity is already to forsee an action" but what if the entity cannot easily be seen?.

Perhaps, then, rather than equate 'normal' with healthy, we should align ourselves with the #thenewnormal of always already being infected and at risk of infection. What counts as 'healthy' today is different to what counted as healthy pre-COVID-19. Indeed, the arrival of antibody tests which can (in most cases) identify those who have been infected, and who may therefore be immune, raises the possibility that the only way to get back to normal is first to become infected or to simulate infection via vaccination. Equally, the possibility of being infected by others continues to reconfigure our engagement with the spaces of everyday life. Everyday sites and spaces (e.g. shops, parks, buses, cafes) take on new meanings as potential sources of infection, reimagined as 'biosecurity borderlands' where "pathogens, hosts, knowledge practices and others beside intra-act to make life more or less safe" (Hinchliffe et al. 2013, p. 540). COVID-19 has become a caveat to our social worlds, shaping our interactions with other humans (and nonhumans, see Gorman this volume) and with space. Many bodily practices that were previously 'normal'—crowded trains, shops and cities, industrial agriculture—are now rendered different and even threatening by a new awareness of human–microbe entanglements.

In conclusion, the current COVID-19 pandemic leads us to question what is new (or indeed normal) about #thenewnormal. If, as Canguilhem argues, ultimately disease is a subjective experience, perhaps the novelty of COVID-19 lies not in its virology, or in our social, political, economic, or biomedical responses to the threat it represents (which have many historical antecedents), but in the challenge it presents to the idea there was ever a moment when we were virus-free and uninfected. In questioning the #thenewnormal, health geographers might also bring into question the assumptions we make about what constitutes 'normal' and 'healthy' in the midst of a pandemic. Firstly, we must continue to challenge the idea that normal and healthy equates to being pathogen-free (perhaps being pathogen-free should rather be classed as the exceptional and abnormal state). Such a move has implications not only for the ways in which we seek to manage the 'borderlines' (Hinchliffe et al. 2013) of disease outbreaks, but the ways in which we treat those already at risk of, or living with, diverse kinds of viral infection and other forms of disease. Secondly, we must draw attention to the ways in which both human and viral bodies rarely conform to the 'healthy' norms—medical, statistical, cultural—which seek to describe them, enriching understandings of the spread and impact of COVID-19 with a close attention to the lived specificities of the entanglement of particular bodies and viral strains on the ground, and the social, political, economic, and epidemiological conditions which shape them. Thirdly, rather than focus on eliminating the virus, and thinking we can clearly demarcate spaces (from regions, to cities, to individual homes and businesses, to individual bodies) as 'virus-free', we might offer new ways of thinking space (and how we occupy it) which recognize microbial copresence, and 'normalize' the body as a key site of social and spatial interactions between humans, viruses and other microbes.

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Chapter 42
Older People

Malcolm P. Cutchin and Graham D. Rowles

1 Introduction

As it now appears, older people are at increased risk for severe illness and mortality from COVID-19. While our understanding of the disease itself is still emerging, the various intersections of aging, geography, and COVID-19 are even less well considered. But those intersections are significant, not only because of the health risk combined with an aging global population, but because the virus is disrupting geographical experience, social participation, and quality of life for older people. It is also threatening the viability of traditional modes of care in old age. COVID-19, therefore, brings the potential of geographical gerontology into sharp focus. Geographical concepts for gerontological thinking and research have been deployed since the 1970s. Geographical gerontology is now a larger, more dynamic, and more mature field of interdisciplinary scholarship applying geographical perspectives, concepts, and approaches to the study of aging, old age, and older populations (Skinner et al. 2018). As argued by Cutchin et al. (2018), geographical gerontology is rich in imaginative pluralism that provides "a collective intellectual toolbox ready for many purposes and problems" (p. 315). We can only represent a fraction of that pluralism here, but what we offer is a starting point that can be leveraged and expanded for addressing the geography of COVID-19. In this chapter we present a preliminary critique and agenda for the geographical gerontology of COVID-19 as a model for understanding and intervening in the crisis. We do not focus of long-term care because it is covered in a different chapter. Instead, we focus on themes of separation and engagement at three different levels of analysis: the individual, the community, and society.

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2   COVID-19 and the Older Person

Growing old has long been associated with a constricting life space, spatial withdrawal and separation as people spend more time at home. COVID-19 has reinforced this pattern and revived the long-abandoned specter of disengagement (Cumming and Henry 1959). Isolation and loneliness, already scourges of the pre-COVID-19 world, are now accentuated by voluntary or enforced quarantining. The experience of older people is increasingly pervaded by fear, anxiety, and acute daily reminders of vulnerability and precariousness. Elevated risk heightens awareness of mortality and undermines retirement aspirations of time with grandchildren or opportunity to travel. Instead, later years of life, for some older people their final ones, are pervaded by requirements for spatial distancing pushing against the fundamental human need for connection (we share Abel and McQueen's (2020) discomfort with 'social distancing' at a time of need for social closeness).

Consider the geography of spatial confinement. For many older people, behavioral consequences of increased risk are minimal; much time was already spent at home. Adjustments to COVID-19 simply increase this duration. Challenges come with times of contact when older people formerly traveled to the grocery store, a doctor's appointment, or to visit friends or family. This is now a hazardous proposition. Hugging a visiting grandchild is no longer possible; instead, there is a drive-by wave or the cold feel of glass during a hand to hand pressing on either side of a window as the surveillance zone, space within the visual field of home, becomes increasingly important in daily life (Rowles 1981). There are, of course, compensations. For some, there may actually be increased communication as direct face-to-face contact is replaced by video, e-mail, SMS, or telephone.

Changing circumstances provide an agenda for geographers to explore aspects of separation and engagement: adjustment of daily routines and use of home space; increased neighbor-to-neighbor mutual concern within emergent media-reported fields of care; and older people's participation in a digital transformation to on-line ordering and home delivery. Finally, geographers should investigate how prolonged shared spatial confinement affects the mental health of older people and caregivers and potentially increases elder abuse.

3   COVID-19 and the Community

One encouraging consequence of COVID-19 has been the manner in which individual neighborhoods and communities have responded to the pandemic. Throughout the world there has been a resurgence of community as formal neighborhood associations and informal groups of concerned citizens band together to provide support to older people. Among the emergent options are programs of food preparation and sharing (left on the doorstep), shopping assistance, and neighborhood drive-bys and celebrations. Paradoxically, as older people in many communities experience

spatial isolation, they become more socially engaged with neighbors. Throughout the world, numerous jurisdictions are developing strategies for formalizing such support in ways that anticipate an environment that may never return to a pre-COVID-19 normal.

Undergirding this movement is a fundamental implicit recognition that the social organization of communities and care for older adults requires radical transformation. Over the past century, the model of care for older people in communities has gradually transitioned toward social and spatial segregation with the proliferation of special housing and assisted living alternatives. The ultimate expression of such separation is the nursing home, the final place of residence for many older adults. As alarming statistics from May 2020 suggest, between 24% and 82% of all COVID-19 deaths in numerous European countries and North America were tied to long-term care facilities (Comas-Herrera et al. 2020). Such concentrations of the most vulnerable are a recipe for death. In a world of physical distancing, a model of care that concentrates the most vulnerable in a single location is irresponsible (Palombi et al. 2020). Concern about social or spatial integration versus geographical segregation (both voluntary and enforced) of older people has a long history. There will be increasing need to adopt both new and existing models of community-based care that nurture the safe integration of older people, even during their final stages of life, within the community at large. Such models will emphasize home care and developing formal and informal networks in communities, a topic providing fertile ground for novel inquiry into the geography of service delivery.

4   COVID-19 and Society

Work on cumulative inequality across the life course (e.g., Ferraro and Shippee 2009) suggests strong influence of social structures on health and well-being in later life. In the United States (US), for instance, local, state, and federal laws, policies, and practices of society and its institutions provide advantages to some racial groups while disadvantaging or neglecting others, such as African Americans (Williams et al. 2019). Such institutional racism varies spatially, often leads to separation through racial residential segregation, and results in negative health outcomes such as those stemming from COVID-19. Early indications suggest higher rates of serious morbidity and mortality among African Americans, Latinos, and Native Americans from COVID-19 in the US, compounding the dynamic of cumulative inequality across the life course and leading to double jeopardy for older minorities (van Dorn et al. 2020). Further compounding the structural risk for older adults are what we might call political 'deficits of place' where relatively poor preparation and/or response in policy development and implementation have caused additional COVID-19 risk for older people at national, regional, state, and local geographical scales. These structural socio-spatial issues call for geographers' attention.

Other existing social dynamics have emerged as particularly problematic for older people during COVID-19. One example is the exacerbation of social and

place exclusion, a common phenomenon that has pernicious effects on older people (Walsh et al. 2020). Lockdowns and their phased easing have increased social exclusion for older people, enhancing some of the individual and community level effects discussed above. Another example, ageism, or the implicit and explicit bias held against older people, has been heightened across various contexts during the pandemic. Those include not counting deaths in skilled nursing facilities across much of the US in the early months of the pandemic, the triage of older people in overwhelmed hospital settings, and the reinforcement of intergenerational separation by isolating older adults because of a perception of higher risk during COVID-19 (Ayalon et al. 2020). Social exclusion, ageism, and other social processes which threaten older people in various places around the globe are important issues for future inquiry.

5 Responding to Precarity

The concept of precarity, "life worlds characterized by uncertainty and insecurity" (Waite 2009, p. 412), is useful in thinking about older people and COVID-19. 'Precarity', a structural force related to neoliberal policies and austerity programs, and 'precariousness', the interpretive understanding and experience of such conditions, "offer complementary, intersecting and equally necessary windows into insecurity and risk in relation to ageing and late life" (Grenier et al. 2020, p. 15). Indeed, the deterioration of institutions in Western societies over recent decades has resulted in a loss of protections for older people and a concomitant increase in precarity and precariousness. A response to the precariousness of older people in a COVID-19 world is needed.

We have recently argued (Rowles and Cutchin 2020) that the pragmatist philosophy of John Dewey offers a way forward in its focus on emergent 'problematic situations' and the precariousness they represent. In brief, foregrounding the perpetual instability of the world and communities we live in, Dewey's philosophy argues for critical democratic deliberation by citizens—which would include older people—to determine and develop alternative courses of action to lessen the threat of ongoing precariousness. Dewey's argument for a democratic 'method' of reconstruction is to employ 'social inquiry' to respond to and meliorate such situations of precarity and of social exclusion—not only in response to emergent problematic situations, but also in preventing future ones. Social inquiry includes understanding geographical dimensions of the evolution of social customs and habits affecting older adults in a COVID-19 world, such as the attitudes, practices, and institutional issues noted above. Moreover, this position suggests a process of inclusive community engagement to employ collective intelligence and imagination, including the contributions of older people. In social inquiry, scientists and scholars act as consulting 'experts' who assist, not determine, public deliberation, imagination, and decision-making by communities and their older people. We believe that if Dewey's method were practiced more during the pivotal problematic situation of COVID-19, older people,

communities, and societies would have better short-term and long-term outcomes. We thereby call for full engagement of older people in democratic social inquiry (in places)—joined by scholars and scientific 'experts'—to generate imaginative, if provisional and fallible solutions, to the type of individual, community, and social COVID-19 problems we have outlined.

6 The Moral Imperative of COVID-19

COVID-19 has presented unexpected new challenges for individuals confronting the illness and its consequences, for local communities, and for societies. With respect to older people, addressing these challenges is an unforeseen test of medical acumen, technological capabilities, economic resilience, political will, and social conscience. But it is more than this. The current situation provides an opportunity, indeed requires us, to confront crucial moral and ethical questions pertaining to the role and value of older people and how we—together—reshape the world as we move forward. It also requires us to confront issues of inequality and exclusion of minority populations, long-time latent social concerns, brought into strong relief by the current situation. For gerontological geographers, this is a unique opportunity to share knowledge and expertise on processes of separation and engagement and to foster inclusivity in shaping new geographies of aging that will inevitably be the outcome of the COVID-19 pandemic. Responding to COVID-19 must be used as an opportunity for celebrating the diversity of aging trajectories, enhancing inclusion and social justice, and reinforcing intergenerational linkages, not as an excuse for "walling off the old" (Ayalon et al. 2020, p. e49).

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Chapter 43
Children and Families

Louise Holt

1 Introduction: A Tale of Two Lockdowns

As a scholar within the field of children, youth, families, space, and place, I have been intrigued by the centrality of families to media reporting about COVID-19—the impact of school closures and the lockdown on families, along with new geographies of caring from a distance or in isolation. When I first started writing this chapter, England had the second highest death rate per capita from the COVID-19 virus in the world. During the course of writing, other nations have overtaken the United Kingdom (UK) to this grim accolade. Questions remain as to why an affluent, developed country with a stressed but enviable public health and national health service (NHS) should have such high infection and death rates. According to the Economist Intelligence Unit (EIU), which assessed the policy responses of all the OECD counties, the UK response to COVID-19 was 'poor' (EIU 2020). The impact of COVID-19 in the UK is contextualized within 10 years of Austerity and already increasing death rates and declining life expectancy attributed at least in part to the social care crisis (Hiam et al. 2017). The UK/England currently has a populist right-wing government (to the right of any within living memory), a significant predictor of high infection and death rates from COVID-19 (Rachman, 2020). The English government initially took a laissez-faire approach of minimal intervention, with the aim of attaining 'herd immunity'. The UK was also slow to go into lockdown; it has been modelled that the UK could have saved up to 75% of lives lost to COVID with an earlier lockdown (Donnelly and Morgan, 2020). In early March, as community testing was abandoned, the government allowed schools to remain open and large public events to take place (e.g. the Cheltenham Horse Racing Festival with around 60,000 attendees, March 12).

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2 Lockdown, School Closures and the Differing Impact on Children and Families

On March 17, the government announced a lockdown, including school closures from March 20. Schools remained open for small numbers of children—the children of 'essential workers' and 'for those children who absolutely need to attend'. Those children 'who absolutely need to attend' include those with Educational and Health Care Plans (EHCP) for their Special Educational Needs and Disabilities (SEND) and 'vulnerable children' on the child protection register (i.e. children in families with intervention for abuse and neglect). Given years of Austerity, many families in need of support are not on the child protection register, and many young people with SEND do not have EHCPs.

Despite planned phased reopening of schools (which often did not happen due to concerns of the efficacy of the test and trace and other protective systems), the majority of British young people will have not attended school between March and September, at least. Critically, the lockdown and the continuing patchy opening of schools has had a major impact on all young people and their families, including increased mental ill-heath and anxiety (The Children's Society 2020).

The inequalities of experience for different groups of children are clear, and were raised by the Children's Commissioner for England, among others. Lockdown and home schooling exacerbated existing inequalities for children in poorer, less educated, and Black and Minority Ethnic (BAME) families, particularly those in overcrowded situations, in temporary accommodation, or with families with mental ill-health or drug and alcohol addictions. The daily exercise and access to open space has been protective of children and young people, and their families' mental health, in lockdown; however, poor and BAME groups, and those residing within inner city areas, often do not have access to green space. One in eight households (12%) in Great Britain (and one in five in London, 21%) have no access to a garden (shared or private); in England, BAME people are nearly four times as likely to not have any access to a garden, patio, or balcony (ONS 2020). At the height of lockdown, parks in some of the poorest urban areas, particularly in London, were closed down (Hanley 2020), depriving the residents of these areas, who are disproportionately poor and from BAME groups of a space to conduct their daily exercise. The two quotes below emphasize the contrasting experience of lockdown between families with and without access to a garden or public open space:

> "The gates on the local nature reserve have been closed, and all the local sports facilities have been shut down. Even the basketball hoops have been removed," said Natasha Dunbar, who lives with her two daughters, aged 10 and 15, in a flat in Essex. [Jada, 10 says] "I'm getting on quite well, it's been quite fun because I've been enjoying time with my family, but wish I had a garden and a bit of space, and a trampoline," she said. "I really enjoy PE at school – I do gymnastics and swimming – and I miss it. A garden would give us more fun and exercise." (Blackall 2020).

By contrast, a young person on a BBC blog reports that when she returns to school:

"I'll miss homeschool and playing outside most of the day cos where I live there r a lot of fields and last week me and my sisters went down to one of them and made a den in it and we now spend most of the day down there just fixing it up and playing around". (BBC Newsround 2020).

A study by the Institute of Fiscal studies highlights significant disparities in support for home learning between more affluent and poorer households (Andrew et al. 2020). More affluent households spend significantly more time on home schooling and their children and have greater household resources to support these learning activities. Clearly, more educated families have the cultural capital to support home learning. The report also found significant disparities in the level of support between affluent and poorer households from their schools, whether state or private, with "64% of secondary pupils in state schools from the richest households are being offered active help from schools, such as online teaching, compared with 47% from the poorest fifth of families. 82% of secondary school pupils attending private school are offered active help…" (Andrew et al. 2020: 2; see also Van Lancker and Parolin 2020). Clearly, private, fee-paying schools have an imperative to provide high quality resources to command a fee. Nonetheless, income-based education inequalities are not tied exclusively to the ability of families to pay for schooling; it has long been demonstrated that middle-class parents deploy their cultural, social and economic capital to ensure their children benefit from the best state education (Butler and Hamnett 2011). Young people from BAME backgrounds are over-represented amongst lower socioeconomic backgrounds and are more likely to live in overcrowded and multigenerational homes, and therefore learning in lockdown is likely to be a significant challenge for young people from BAME backgrounds. As 16+ and 18+ exams were cancelled to be replaced by teachers' predicted grades, concerns have also been raised that the grades of poor and BAME children are likely to be under-predicted (Haque 2020), reflecting low expectations of these groups from teachers demonstrated in previous research (e.g. Wyness 2017).

For some families, the hardships caused by lockdown, even in a wealthy country such as Britain, have been stark, including an increase in hunger as families lose important income. Despite some protective measures, the Food Foundation claims that one-fifth of households with children faced food insecurity in April and May 2020, and these rates were highest amongst lone parent families, families with disabled children and those from Black and Ethnic Minority groups. The left-leaning Institute for Public Policy think tank estimates that an additional 200,000 children have been pushed into poverty as a result of the pandemic and associated restrictions, in addition to the 4.2 million children who were already in poverty.

Lockdown has led to an epidemic of domestic violence globally and within the UK context (Townsend 2020), including child abuse and neglect (BBC Newsround 2020). Although conflict in families cross-cuts social differences, it is intensified in families with pre-existing mental health issues, in overcrowded situations, or where economic hardship leads to stress (Usher et al. 2020). Former Home Secretary, Sajid Javid (2020) raises specific concerns about child intra-familial child abuse and neglect, where "children are left to isolate alongside their abuser".

Children from poor and BAME backgrounds are more likely to experience familial morbidity and mortality, adults from BAME groups are disproportionately infected with COVID-19 and death rates were significantly higher for BAME groups (e.g. twice as high for people of Bangladeshi ethnicity). Therefore, children from BAME groups are more likely to be bereaved than those from white backgrounds (Zubaida Haque, Director of the Runnymede Trust racial equality think tank, quoted in Richardson 2020).

3   Conclusion

To encapsulate the tale of two lockdowns for families in England where social class and divides based on race, ethnicity, disability and every other 'axes of power' are becoming entrenched, I focus on stark examples of two fathers. The first, indispensable advisor to Boris Johnson and chief architect of Brexit, Dominic Cummings, is defended by Boris Johnson as "following the instinct of every father" when he travelled 260 miles to stay in a cottage in his parents' farm with his wife and young son when his wife was exhibiting the symptoms of COVID-19, apparently breaking lockdown rules. The Oxford and privately educated, son-in-law to Sir Humphry Tyrrell Wakefield, was supported by Boris Johnson in the face of calls for him to step down. Meanwhile, nurse Augustine Agyei-Mensah, father of four, like 550 health care workers, died of COVID-19 in May. This is a tale of white, upper class familial privilege versus BAME and working-class vulnerability, and the image presented is stark, visceral, telling, and unfortunately representative of family geographies of COVID-19 in England. It is perhaps representative of family geographies in England more generally, where these inequalities usually pass under the radar.

Shortly after submitting the chapter for review, the UK faced its second wave of the pandemic. In line with the government response to the first wave, the English government were late to act, ignoring calls from its own Scientific Advisory Group to take drastic action, and in stark contrast to responses in the devolved nations, and then had to institute a severe lockdown. Investigative journalism has uncovered how critical contracts for England's testing and tracing programme were given to close associates of the government and government advisors with no experience of successfully delivering such programmes and without competitive tendering under emergency COVID-19 rules (Conn et al. 2020). To date (December 8) in the UK 61,337 people have died of COVID-19 after being tested, and the UK has the sixth highest death rate per capita globally according to John Hopkins University. The roll-out and delivery of a vaccine is providing hope in the UK context, although the looming deadline of the Brexit transition period and a failure to reach an agreement with the EU threatens vital trade and supplies, including of supplies vital for testing and vaccines.

In the UK, the global pandemic on top of 10 years of austerity and the shock of Brexit has had a catastrophic impact on the economy and society which will be felt for decades. The high streets have been deserted during lock downs and local restrictions and the pandemic has exacerbated existing trends to move from high street to

online shopping. With the closure of many renown stores on the highstreets, they will never be the same. This has impacts on children and families, particularly those that live in towns and cities. The pandemic has exposed and exacerbated faut lines in English society. The extent of job loses tied to the pandemic are only just beginning to be realized. Government policies to support 'furloughed' workers provide 80% of their income. Clearly this is of critical importance, and others might look at this with envy in societies where poor families rely on informal employment. It is hard to imagine that in an affluent nation such as the UK, children, could be going hungry; however, it is stark that debates about child hunger in England take for granted that it exists and focus on the need for the state to provide meals during holidays as well as term time.

Future research is needed to examine the uneven and unequal lived experience of families going forward from this moment. I am tempted to write post-COVID-19, which in the UK we have reason to hope might come. It is apt to question whether there will ever be a post-COVID. COVID may have changed our social and cultural ways of being forever as we become accustomed to social distancing. When children are in a play park and have to be reminded to 'social distance' from children outside of their bubble, how does this affect their psyches and their encounters with others? Although schools stayed open throughout the latest lockdown and keeping schools open has been a government priority, children and young people's education has been disrupted both by lockdown, needing to self-isolate and catching COVID-19. Some schools have the resources and technologies to provide live streaming classes to children and young people who are at home. Clearly, as with the first lockdown, well-resourced private schools and state schools who cater for more affluent and educated families, will be more equipped to provide these services. Crucial research questions are tied to how these inequalities in education can be overcome.

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Chapter 44
Race, Ethnicity, and COVID-19: The Persistence of Black–White Disparities in the United States

Dustin T. Duncan, Alicia T. Singham, Danielle C. Ompad, and Melody S. Goodman

1 Introduction

The 2019 Novel Coronavirus (SARS-CoV-2, also known as COVID-19), as discussed in other chapters in this book, is caused by a highly infectious virus from the coronavirus family. Disparities by race/ethnicity in COVID-19 exist across multiple geographic regions, especially in highly racialized settings such as the United States (US), the United Kingdom, South Africa, and Brazil, where racial/ethnic minorities only make up 14% of the overall population but comprise 34% of COVID-19 deaths (Phillips 2020). This chapter focuses on racial disparities in COVID-19 infection, hospitalization, and mortality in the US, with a specific focus on Black Americans (also referred to as "African Americans"), because of the unique socio-historical roots of race in the U.S. context and given that the US has been disproportionately impacted by COVID-19.

At the time of writing, close to 12.5 million confirmed cases and over 257,000 deaths due to COVID-19 have been recorded in the US. Overall, Black Americans have 2.3 times the mortality rate from COVID-19 as Whites and Asians, twice the mortality rate as Latinos and Pacific Islanders, and 1.5 times the mortality rate as Indigenous people (APM Research Lab Staff 2020). In addition, there are disparities in COVID-19 hospitalizations; a study conducted in a large health care system in California found that compared with non-Hispanic White patients, non-Hispanic Black American patients had 2.7 times the odds of hospitalization, after adjustment for age, sex, comorbidities, and income (Azar et al. 2020). In some locations, these

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racial/ethnic disparities are much more extreme; for example, in Washington DC, Black mortality rates are sixfold higher compared to Whites (APM Research Lab Staff 2020); and in Louisiana, a large cohort study found that 70.6% of COVID-19 patients who died, and 76.9% of those hospitalized for COVID-19, were Black even though the base population from which those cases arose was only 31% Black (Price-Haywood et al. 2020).

Put in more striking terms, "If they had died of COVID-19 at the same rate as White Americans, at least 15,000 Black Americans … would still be alive" (APM Research Lab Staff 2020). These excess 15,000 Black deaths account for over 10% of the U.S.'s overall COVID-19 mortality and have a clear root in structural racism which we describe in the next section of this chapter.

2   The Case of Black Americans

As race is socially constructed—and thus constructed differently across time and societies—we must start with an explanation of Black identity in the US today. The US census uses definitions of race and ethnicity from the Office of Management and Budget (OMB), which rejects a biological or genetic basis for race. Instead, it relies on self-identification with social racial categories (i.e., Black or African American, Asian, Native American or Alaska Native, Native Hawaiians and other Pacific Islanders, and White), and allows for people to report more than one race. Ethnicity is a separate category, delineating between people who are or are not of Hispanic or Latino origin (US Census Bureau 2020).

Black identity and material conditions have important roots in slavery and its sequelae. Even after the abolition of slavery in 1863 with the Emancipation Proclamation,[1] the US enforced de jure and de facto racist policies and systems that maintain to this day a hierarchical relationship between Blacks and Whites, in which Blacks are subordinate. For example, patterns in racialized housing, education, job opportunities, and restrictions established a historical trend of Black American migration into segregated industry towns, which later turned into current-day "ghettos" (Thomas 2006). This racial residential segregation and the geographic patterning of social conditions (often correlated with race) influence the social patterning of health (which we later describe as a one salient cause for COVID-19 disparities).

Consequently, the racial and ethnic disparities in COVID-19 mirror racial and ethnic disparities in health more broadly. In a study of *The Philadelphia Negro* (published in 1899) and in *The Health and Physique of the Negro American* (a 1906 volume), W.E.B. DuBois documented the differences in quality of health between Blacks and Whites during the late nineteenth and early twentieth centuries (Du Bois 2003, 2007). Black–White differences in health persist today across a wide array of

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[1] Note that enslaved persons in Texas did not find out until June 19, 1865.

conditions (e.g., diabetes, hypertension, asthma, obesity), many of which are risk factors for COVID-19. In the next section, we provide an overview of the causes of Black–White disparities in COVID-19.

3   Causes

It is not an accident that Black Americans have subordinate health outcomes. COVID-19 is not unique; it has merely revealed and exacerbated existing racialized health disparities in the US. These disparities exist and persist due to racism, in particular "structural racism" (rooted in White supremacy)—a term that refers to "the totality of ways in which societies foster [racial] discrimination, via mutually reinforcing [inequitable] systems." (Bailey et al. 2017). See Table 44.1 for a comprehensive overview of the structural causes of racial/ethnic disparities in COVID-19.

First, Black Americans are the most segregated racial group in the US with average neighborhood racial composition rates in 2010 similar to those in 1940 (Logan and Stults 2011). Scholars have argued that racial residential segregation is the cornerstone on which Black-White disparities in health status have been built because it shapes socioeconomic opportunity structures, determines access to health-promoting resources and services, and constrains individual health choices that affect health risks (Williams and Collins 2016). Segregation creates different exposures to critical resources that shape health trajectories, and empirical research has documented negative associations between segregation, health, and mortality (Williams and Collins 2016). Importantly, the effects of segregation are not borne only by Blacks of low income status; Blacks are less able to reside in neighborhoods commensurate with their socioeconomic status (Logan and Stults 2011), and lower and higher income Black communities are often not spatially distinct (Iceland et al. 2005).

In the context of COVID-19, one source of risk tied to residential segregation is air pollution, as Black neighborhoods often have lower-quality environmental conditions such as higher rates of pollution. Increased pollution in one's county of residence substantially increases the COVID-19 death rate, likely due to the cumulative negative health impacts of pollution on the lungs (Wu et al. 2020). For more information on the effects of neighborhood characteristics on COVID-19, please see the chapters on "spatial epidemiology" and "everyday mobilities," which discuss some of these issues in greater detail.

Another racialized risk factor for COVID-19 is the US's system of mass incarceration. Racial targeting of Black Americans at every level the criminal justice system leads to them being incarcerated at 5.1 times the rate of Whites (NAACP). Prisons and jails are notoriously dangerous congregate environments, with ample opportunity for the spread of infectious disease both within and beyond their walls (Kajeepeta et al. 2020). A recent analysis of data from US federal and state prisons found that the COVID-19 case rate was 5.5 higher among incarcerated people

Table 44.1 Structural causes of racial/ethnic disparities in COVID-19 infection, hospitalization and mortality

Reason	Health mechanisms
Racism	"A system of structuring opportunity and assigning value based on the social interpretation of how one looks (which is what we call "race"), that unfairly disadvantages some individuals and communities, and unfairly advantages other individuals and communities" (Institute Staff 2016)
Residential segregation	Neighborhoods that are predominantly Black often have decreased access to health-promoting products and services (e.g., healthy food options; gyms, parks, and greenspace for exercise; hospitals and health care providers)
Environmental injustice	Due to residential segregation, Black Americans often live in neighborhoods with worse environmental conditions such as pollution (Millett et al. 2020). Increased pollution in one's county of residence has been shown to substantially increase the COVID-19 death rate (Wu et al. 2020)
Crowded, multi-generational households	Racial/ethnic minorities are more likely to live in multi-generational households and crowded households, increasing the risk for COVID-19 transmission. Indeed, crowded households make it difficult to isolate person with suspected or confirmed COVID-19
Mass incarceration	Racial targeting of Black Americans at every level the criminal justice system leads to them being incarcerated at 5.1 times the rate of Whites (NAACP). Prisons and jails are dangerous congregate environments, with ample opportunity for the spread of infectious disease both within and beyond their walls (Kajeepeta et al. 2020)
Job discrimination	Job applicants with White-sounding names receive 36% more callbacks for job interviews than similarly qualified applicants with Black-sounding names (Quillian et al. 2017). Pervasive job discrimination impacts health through a lack of disposable income, housing security, and employer-sponsored health insurance
Occupational hazards	Racial/ethnic minorities disproportionately occupy low-paid service and front-line jobs in the U.S. (e.g., grocery store clerks, janitors, child care staff, hospital staff, transit workers), which put them at higher risk for COVID-19 exposure
Underlying health conditions	Black Americans experience higher rates of diabetes, cardiovascular disease, respiratory disease, and obesity. The conditions which disproportionately impact Black Americans are the exact same subset of conditions that increase the risk of severe COVID-19 infection
Weathering and stress	Black Americans experience early health deterioration (known as "weathering") as a result of repeated exposure and adaptation to stress due to racism that cannot be explained by other factors like poverty (Geronimus et al. 2006). Weathering essentially ages Black bodies faster, which increases the risk and severity of COVID-19
Access to health care	Black Americans have lower access to health care services during the COVID-19 pandemic, because they are more likely to be uninsured (Tolbert et al. 2020) and more likely to live in areas with health care provider shortages (Gaskin et al. 2012)

Table 44.1 (continued)

Reason	Health mechanisms
Quality of care	Due to residential segregation and differential health insurance coverage, Black Americans during the COVID-19 pandemic are more likely to be treated at hospitals with inferior quality of care (e.g., staff and equipment shortages, personal protective equipment shortages), which leads to worse health outcomes(Rosenthal et al. 2020)
Healthcare provider bias and medical mistrust	Providers with implicit or explicit racial biases are less likely to listen to and believe Black Americans about the severity of their symptoms, and therefore provide lower quality of care to Black Americans, including COVID-19 care. For this reason and the historical legacy of centuries of neglect, abuse, and exploitation of Black communities, Black American may mistrust the medical system

compared to the general population, and the COVID-19 mortality rate was three times higher (Saloner et al. 2020). In Chicago, one single jail was associated with 15.7% of all documented COVID-19 cases in the entire state of Illinois (Reinhart and Chen 2020).

Racial/ethnic minorities, on the other hand, disproportionately occupy low-paid service and front-line jobs (sometimes referred to as "essential workers") in the U.S. (e.g., grocery store clerks, janitors, child care staff); in New York City, 75% of front-line workers during the pandemic shutdown were people of color (Bureau of Policy and Research 2020). This drives health disparities because of increased workplace exposure to COVID-19. However, it also takes a psychological toll; front-line workers face stress and fear from having to work dangerous jobs during the pandemic and carry the emotional burden of caring for the nation in a time of crisis while simultaneously caring for themselves and their loved ones.

Existing racial and ethnic disparities across a broad range of health outcomes also contribute to the higher rates of COVID-19 cases and mortality for Black Americans. Diabetes, hypertension, and obesity are all risk factors for COVID-19 infection and complications, which are all over-represented among Blacks. Relatedly, Black Americans experience early health deterioration (known as "weathering") as a result of repeated exposure and adaptation to stress due to racism that cannot be explained by other factors like poverty (Geronimus et al. 2006). Weathering essentially ages Black bodies faster. The often-touted mantra that people ages 65 and up are at the most risk for COVID-19 complications ignores racial differences in age-based mortality rates. Case in point, Non-Hispanic Blacks ages 35–44 experienced 9 times the COVID-19 mortality rates of same-aged Non-Hispanic Whites (Bassett et al. 2020).

Lastly, structural racism gets in the way of Black Americans accessing quality health care when they need it. Black communities often have fewer health centers and fewer medical providers. Black Americans are less likely to have health insurance. And even if they do receive care, providers with implicit or explicit racial biases are less likely to listen to and believe Black Americans about the severity of their symptoms, and therefore provide lower quality of care to Black Americans.

We note the need to pay attention to other social categories that interact with race, where the compounding of marginalized identities can result in an even greater health toll than what would be expected (termed "intersectionality"). For instance, Black gay, bisexual, and other sexual minority men (SMM) may be especially vulnerable to the COVID-19 pandemic. An estimated one of two Black SMM will contract HIV during their lifetime, and an underlying condition such as HIV infection may put an individual at higher risk for contracting COVID-19. Further, COVID-19 may be of particular concern for those who smoke tobacco or use other substances such as alcohol (Farsalinos et al. 2020). Black SMM are at high risk for marijuana use, and marijuana use increases the likelihood of smoking cigarettes. In addition, while COVID-19 prevention requires social distancing and isolation, this may not be possible for Black SMM, who often have high rates of housing instability and may be more likely to engage in sex work due to job loss in economic downturn resulting from the COVID-19 pandemic (Duncan et al. 2019).

Given these structural and social determinants, it is clear that racial and ethnic disparities in COVID-19 infection and mortality are *not* due to individual choices (e.g., failing to wear a mask or practice physical distancing). In fact, there is evidence that Black Americans are more likely to wear a facemask, stay home, and clean high-touch surfaces during the pandemic than Whites. Therefore, we need structural solutions to combat these structural and entrenched problems. For example, contact tracers should be trained in culturally competent communication, and preferably come from the communities they will serve. We need continued monitoring of race-based differences in COVID-19 testing, diagnosis, and recovery to redirect resources to communities where they are needed most.

One ray of hope is the resilience of Black American communities, despite the centuries of exclusion and abuse they have endured. Racial socialization and pride can be protective in the face of stress and discrimination as well as community social cohesion and social capital. Indeed, Black communities tend to have especially strong extended social networks, which provide both tangible resources and social support (Brown 2008). Future research on COVID-19 disparities, including racial/ethnic disparities, should be systematically studied in the U.S. and international contexts. Studies are needed only documenting these disparities, but also to examine factors that give rise to these disparities.

4 Summary and Conclusion

Any writing on COVID-19 and race in the U.S. would be remiss without a mention of the sweeping protests against police brutality and anti-Black racism that manifested in every major city in the US and reverberated around the world during the COVID-19 pandemic. Just as racism intersects with other systems of oppression (e.g., homophobia, sexism, poverty) to compound the negative health effects experienced by marginalized populations, the COVID-19 pandemic and police brutality are just two of many interwoven manifestations of anti-Black racism in the US,

existing in a vicious cycle that produces and reproduces widespread racialized health disparities.

Public health research and response is often complicit in the reproduction of these racialized health disparities. When we fail to collect health data by race, or insist on stratifying differential COVID-19 outcomes by "underlying conditions," rather than the racial determinants that *themselves* underlie those conditions, we erase the political and racist underpinnings of inequality that Black Americans face (McClure et al. 2020). Therefore, a robust public health response to the COVID-19 pandemic must include a commitment whose scope is larger than just health; we as a society need to dismantle all systems that are rigged such that those who are advantaged stay in power, and those who are disadvantaged stay oppressed.

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Chapter 45
Understanding the Importance of a Gendered Analysis of COVID-19

Grace Adeniyi-Ogunyankin and Linda Peake

1 Introduction

The current novel coronavirus disease 2019 (COVID-19) is a viral phenomenon, governed in its spread by social, cultural, economic, and political processes. Perhaps, most pertinently, it travels along existing lines of inequality, gender being one of these major fault lines. And yet, the authors of an editorial in *The Lancet* state that they are unaware of any gender analysis of COVID-19 by global health organizations or governments (Wenham et al. 2020). That the differential gendered impact of previous viral pandemics (e.g., Chikungunya, Dengue, Ebola, MERS, SARS, Zika) has served for nothing in terms of preparedness for, analyses of, and responses to COVID-19, speaks to the consequences of an intertwined global system of patriarchy and racial capitalism (Robinson 1983) in which the lives of millions of women and girls count for little, and the lives of racialized women and girls even less. Hence, the need for an intersectional approach to a gender analysis of COVID-19 that can maintain a focus on those most marginalized.

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2 Gender and COVID-19

It is from the body that understandings of gender arise: gender is the socially constructed hierarchical differences between differently sexed bodies that exist not as a binary of female and male but as a continuum, from those whose sense of personal identity corresponds with the sex assigned to them at birth (cisgender) to those for whom it does not (transgender). Although this understanding is widely accepted among feminist scholars, the relationship between the socially constructed and the physiological aspects of the gendered body continues to be contested. Along with Fitzgerald and Callard (2015, p. 19), we argue that "it is increasingly difficult for the social sciences to maintain a potent hold on the expansive category of 'human life' while remaining indifferent to the complex neurogenetic textures of human capability". In other words, while gender (and sex) may be understood as socially constructed, this construction takes place within the fleshy confines of a complex biological and physiological bodily system. Thus, we examine COVID-19 disparities between gendered bodies in relation to biological, social and behavioural, factors while accepting that their relative roles in terms of gendered vulnerability to COVID-19 is not yet known (Betron et al. 2020). A focus on the body, moreover, for feminist geographers is about the body in place, and hence an emphasis on embodiment. Embodiment not only locates bodies within the discursive and material environments that constitute them, it is also concerned with, "constructing knowledge that theorizes *from* bodies, privileging the *material* ways in which bodies are constituted, experienced and represented" (Moss and Dyck 2003, p. 60). Hence, an intersectional approach to embodiment requires that the gendered body always be understood in relation to the dynamics of race, class, age, sexuality and other social relations of power as they operate in and through place.

2.1 Biological Factors

Despite a globally equal rate of infection of COVID-19 between men and women, there is a more severe level of disease and higher level of mortality among males than females (Wenham et al. 2020) (and among adults than children). It is biological, physiological, and phenotypical differences between differently gendered bodies that have been used to largely explain this difference in morbidity rates, albeit that men's vulnerability to COVID-19 may be increased by "gendered practices and behaviours related to masculinity, … engaging less in preventive public health measures such as mask-wearing or handwashing, and delayed health-care seeking" (Baker et al. 2020, p. 1886). According to Sharma et al. (2020) the disproportionate death ratio in men may be partially due to their relatively higher levels of pre-existing comorbidities associated with COVID-19 (e.g., cardiovascular disease, hypertension, diabetes, and chronic lung disease), while women are more likely to have higher levels of antiviral immunity by having a 'backup' X chromosome; "X

chromosomes contain a high density of immune-related genes; therefore women generally mount stronger innate and adaptive immune responses" (p. 2). It has also been suggested that "estrogens protect women from COVID-19 by reducing the expression levels of the receptor for the SARS-CoV2 virus i.e., the angiotensin-converting enzyme 2 (ACE2)" (Klein et al. 2020). As to whether sex is an independent risk factor, intersectional research is needed into biological—hormonal, anti-inflammatory, and immunologic—and phenotypical differences in COVID-19 presentations. This research would also need to account for how cis- and transgender bodies have been differentially impacted upon by COVID-19.

2.2   Social Factors

The emerging research on how COVID-19 plays out across gendered, racialized and classed bodies, indicates that biological factors play only a small role in explaining differences in death rates. In the UK, for example, a study using the electronic health records of over 17 million people found that Black people are about twice as likely to die from COVID-19 (ratio of 1.7) with similar numbers for those of Asian or Asian-British ethnicity (ratio of 1.6), compared to those who listed their ethnicity as white (The OpenSAFELY Collaborative 2020). However, this detailed clinical data revealed that it is predominantly social factors that explain these ratios. The increased risk of dying stems not from pre-existing biologically explained medical conditions, but from greater exposure to the virus among these groups, through over-representation in (often poorly paid) frontline jobs, as well as living in areas of environmental and housing deprivation, with, for example, higher exposure to air pollution and higher household density. Such fault lines of inequality indicate the significant role that institutional racism plays in COVID-19. In this vein, the Black Lives Matter protests in the United States during the COVID-19 pandemic have emphasized the connection between the pandemic and the US epidemic of Black death by police: anti-Black racism is a public health crisis. Similar concerns have been raised in Canada, in relation to both Black Canadians and Indigenous people (Allen and Yang 2020; Mercurio 2020).

The gendered social factors of COVID-19 include both those that relate to different gender roles and relations as well as different levels of prevention, reporting, diagnosis or treatment by gender. Notwithstanding women's lower levels of morbidity from the pandemic, for instance, COVID-19 has a disproportionate impact on women because of gendered social factors. Women, and especially racialized women, for example, form 70% of health and social-service workers worldwide (WHO 2018), which places them at the forefront of the pandemic and at greater risk of exposure to the virus. The COVID-19 pandemic has also had a significant impact on women's, children's and men's mental health with increases in stress, anxiety and depression being reported.

Looking through an intersectional lens—taking into account race, class and life cycle stage—women in Canada will predominantly be the most personally and

economically impacted by COVID-19. Data from Statistics Canada (2020, in Wright 2020) shows that women are among those most hit by COVID-19 job losses. In the core working ages of 25–54, the rate of decline for jobs held by women was more than twice that of men. Women's responsibility for work in the home and within the family—activities of social reproduction such as child and elder care and housework—has also increased in many places during the pandemic, despite many men now being more available for longer time periods (Hinsliff 2020).

The inherent geographical unevenness of the pandemic in terms of infection and death rates is also intricately connected to gender. For example, in Indonesia (and other places), women who live in informal settlements with limited to no water and sanitation find it difficult to comply with shelter in place orders (Jones 2020), thus making them more vulnerable to exposure.

The pandemic and resultant lockdown measures have also highlighted, and in many places have contributed to an increase in, the global epidemic of domestic violence. Prior to the COVID-19 pandemic, studies showed that women were at higher risk of domestic violence when families spend more time together; yet, governments failed to take these statistics into account when lockdown measures were put into effect (Taub 2020). In some places, especially those with regulated economies, responses are now being undertaken. In Canada, for example, in April 2020, the government announced $40 million for women's shelters and sexual-assault centres (Wright 2020); $40 million is however insufficient to address what this sector needs.

3   What Is Being Done?

If the response to COVID-19 is to be effective, and not reproduce health and gender inequalities, then an intersectional and embodied approach to gendered roles, relations, and identities, which influences differential exposure to the disease and the treatment received, must be considered. In Box 45.1, we list a number of strategies that feminist scholars and policy makers are suggesting are necessary to ensure that gendered lines of inequality do not continue to increase. There is evidence that, albeit in a globally very uneven pattern, these strategies are being paid attention. In the UK, for example, maternity leaves have been extended. In New Zealand there is experimentation with the four-day working week. As mentioned above, the Canadian government has allocated extra monies for the alleviation of domestic violence. And increases in levels of depression and anxiety are also being recognized as integral to experiences of both having contracted the coronavirus and of being affected mentally and emotionally by the experience of living through the often disastrous economic effects of COVID-19. However, as we mention in our Introduction, most governments and medical organizations do not place a high priority on gendered issues and infectious diseases.

Box 45.1 Strategies for Recognizing Gendered Dimensions of Covid-19
- Prioritize the needs of children and working parents, especially single parents, for example, through paid furloughs, long-term flexible work schedules (e.g., four-day working weeks) and increasing the length of maternity leave during the pandemic.
- Develop public health policies that: recognize intersectional bodily differences across gender, 'race', class, and life cycle, so that targeted treatment strategies can be implemented and effective and equitable policies and interventions created; include the input of those on the frontline; and address declines in mental as well as physical health.
- Promote healthy masculinities, including addressing violence against women and children.
- Increase women's engagement in national and global decision-making spaces.
- Create sex disaggregated data

4   Conclusion

Gender is an important driver of bodily responses to COVID-19 and yet has hardly featured in efforts to understand the pandemic. For geographers, the major political and intellectual challenge for any analysis that aims to better understand COVID-19 is to push for an approach, sensitive to gendered differences across place, that recognizes gender as a continuum, and the gendered body as a fleshy complex system, both biological and social. A gendered intersectional analysis of COVID-19 also helps us further understand the disproportionate death toll among racialized people as primarily socioeconomic and racist issues (Hirsch 2020, para. 6). Across every sphere of daily life, the impacts of COVID-19 have been exacerbated for women and girls, and more so for those who are racialized and living near or below the poverty line. The COVID-19 pandemic is not only eroding the limited gains in gender equality made over the past decades, with the pandemic deepening pre-existing inequalities, but also exposing vulnerabilities in social, political, and economic realms. Clearly, gendered bodies are not 'all in this together'.

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Chapter 46
People with Disabilities

Edward Hall

Geographies of disabilities is now an established sub-discipline, offering particular insights into the experiences of people with disabilities (Chouinard et al. 2010). From a small number of studies in the 1980s focused on the incidence of chronic conditions and health and social care services, geography shifted and broadened its analytical focus to the societal and structural discrimination and exclusion of people with disabilities, following the lead of the disability political movement and academics with disabilities (Gleeson 1999). At the same time, relations of research were increasingly challenged, with people with disabilities demanding involvement in the setting of the research agenda. While structural analyses remain important, as social and spatial exclusion persists, geographies of disabilities have contributed to significant theoretical developments, critiquing the 'social model' of disability by emphasizing embodied experiences of impairment (Hall 2000), and more recently drawing on notions of relationality and non-representational theory to conceptualize 'dis/ability' as the outcome of an emergent set of relations between bodies, places, and objects (Hall and Wilton 2017). Geography has also continued to contribute to the study of the ongoing transformation of the landscape of care and support for people with disabilities, in the context of broader changes in policy and discourse related to disability (Power and Hall 2018).

The COVID-19 pandemic has had a series of significant and complex impacts on the lives of people with disabilities, which continue to unfold; a fuller assessment of the nature and scale of the impacts will have to take place at a later stage. For now, some initial reflections on the challenges and opportunities for geographical insights and contributions can be proposed.

Of immediate importance is the disproportionate illness and death rates amongst people with disabilities. The UK Office for National Statistics reports that between

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March 2 and July 14 2020, 27,534 people with disabilities died having tested positive for COVID-19, 59% of all deaths recorded (although constituted 16% of the study population); women with disabilities were 2.4 times, and men 2 times, more likely to die than those without disabilities, once demographic factors had been taken into account (ONS 2020). Further, a complex epidemiology of incidence of COVID-19 cases, hospital admissions, and deaths has emerged, with clear and dynamic demographic and geographical patterns: people with higher level of impairment, older people, those with co-morbidities, those from ethnic minorities, and people living in deprived housing and in poor areas, are all more likely to be impacted. As such, the pandemic is a timely reminder of the (commonly neglected) complex inter-sectionality of people with disabilities. Geographical analyses of the type first undertaken by (medical) geographers, as noted above, could make a significant contribution here (Li 2020). That the majority of COVID-19 deaths (as of July 14 2020) were people with disabilities has led to calls for an inquiry (Disability News Service 2020a); accounts from people with disabilities and disability organizations have highlighted how the pandemic has reflected and exacerbated long-standing inequalities and inadequacies in healthcare and social care and support, including lack of access to Personal Protective Equipment (PPE) for care staff, insufficient testing, and restrictions on care and support provision in people's homes and, in some cases, hospitals (with some reports of discrimination in provision of intensive care and other hospital treatments for people with existing health issues) (Disability News Service 2020b; Dickinson et al. 2020). Illness and death rates, and inequalities in healthcare provision, have highlighted the significance of who 'counts' as a 'person with a disability' (Reed et al. 2020). Further, being identified as a person with a disability (or not) determines access to assistance and support, instructions to 'shield', and to receive a vaccine when one becomes available. As geographical studies have demonstrated, there are multiple ways of defining 'disability'; the centrality of biomedical data in the surveillance, assessment, and management of the pandemic has reinforced the equating of disability with impairment and illness. Geographers, who have long contested this 'medical model' of disability, can contribute to the study of COVID-19 by demonstrating how social contexts and relations shape the impact of the pandemic on the lives of people with disabilities.

For many people with disabilities, whose impairments or conditions mean that they are particularly vulnerable if they contract COVID-19, the UK Government has instructed 'shielding' for an extended period, i.e. remaining at home with very limited contact with other people (only essential care staff). Whilst there are medical reasons for this, there has been evidence of a lack of guidance and support (including inability to access food home delivery services and reduced at-home practical care provision). For many people with disabilities, the loss of everyday social contacts, within and outside their homes, especially if they live on their own, has had significant, and as yet not fully understood, impacts on mental and physical health, with some speaking of social isolation and 'being abandoned' (Webster 2020). COVID-19 has also exposed deeper health and social inequalities; for example, people with intellectual disabilities are more likely to be obese, have diabetes and

asthma, and to be on a low income and live in low-quality housing, all of which make someone more vulnerable to the effects of COVID-19, and also face discrimination in access to and quality of care from healthcare services before and during COVID-19 (Hatton 2020).

For all the population, COVID-19 has meant (and will mean for the foreseeable future) a constrained social world, with more time spent at home and restricted movement outside the home. For many people with disabilities, this has meant further constraints on already limited access to and presence within local community and public spaces. The major policy shift over the last 20–30 years towards personalization and independent living for people with disabilities, and the related closures of institutional and collective care provision, has meant that many more people are now living on their own or with a partner, friends or family. Of course, no one lives a truly independent life; geographical studies have shown how people with disabilities living on their own are in almost all cases interacting (to varying degrees) with a network of others—family, friends, formal care or support staff (private and public sector), voluntary organizations, community groups, etc.—in the course of their everyday lives, and it is these interrelations and interdependencies that make independent living both possible and meaningful. COVID-19 is a major disruption to these complex and in some instances fragile networks of relations and supports, and hence the ability to live independently and sustain well-being. As political attention and policy action focused on healthcare provision, at least in the early months of the COVID-19 pandemic in the UK, social care services were neglected. When social care did reach the news agenda, it was chiefly in relation to the high case numbers and death rates in collective environments of (older people's) care homes; people living on their own largely disappeared from view. For people living independently, visits by paid care staff, including personal assistants, and from local voluntary support organizations, were reduced and in some cases stopped; contact with family and friends was also significantly reduced. It was reported that in many cases, local authorities have focused their resources on those in most 'critical need', with home support stopped for many (and challenging to ensure consistency as personalized care and support commonly involves a multitude of care staff and agencies) (Dickinson et al. 2020); UK Government legislation has permitted this to happen (BBC Disclosure 2020; Disability Law Service 2020). Whilst this was understandable and in line with UK Government guidance, it can also be seen as an acceleration of the withdrawal of financial, practical, and social support for people with disabilities during the decade of austerity in the UK (from 2010) (Power and Hall 2018). Many people with disabilities are now seeing few people beyond some care staff (as noted above), with family and friends unable to visit, and movement outside their homes severely restricted; for many children with disabilities, families are taking on more responsibility for care and home education, as care sites and schools in the UK for those with Special Educational Needs and Disabilities remain closed or with restricted opening. For the care visits that remain, these have focused on essential support and involved the increased use of PPE, as well as social distancing. For some people with disabilities, in particular people on the autism spectrum, and with intellectual disabilities, such measures have been distressing. More broadly,

the use of PPE, whilst necessary to prevent infection, has further emphasized how for many people with disabilities, whilst they live in 'their' homes, institutional/clinical practices and objects enter these spaces and in doing so subtly or more obviously transform them. Concerns have been raised that, whilst crucial, measures to protect people with disabilities, as noted above, have meant that public health regulations are increasingly 'in tension' with the established norms of a rights-based person-centred approach to decision-making about delivery of care and support (Doyle and O'Brien 2020).

Telephone and online have been very effective means for many people with disabilities to maintain communication and social contact. Indeed, wider society's increasing presence in virtual space has meant greater opportunities for many people with disabilities to participate in employment, arts and leisure, and social activities (Ryan, 2020); and some have welcomed what have rapidly become the 'norm' of online medical consultations and care contacts. However, there have been challenges of availability of technology and accessibility. For many, online formats cannot adequately replace face-to-face and physical contact, with significant impacts on mental well-being. As more people with disabilities have been encouraged to live independently, mainstream community spaces and organizations (including libraries, leisure centres, and arts venues, as well as cafés and shopping centres) have been presented as 'appropriate' places for people to be 'cared for' by their communities (Power and Hall 2018); alongside this, many voluntary sector organizations have been set up to provide opportunities for people with disabilities to develop interests and skills in arts, employability, and leisure. All of these have come to a grinding halt in the 'lockdown' period, and even as restrictions are eased in many areas, many of these organizations are finding it very hard—practically and financially—to restart their activities. There is a widespread concern that a whole swathe of this new emergent 'landscape' of care and support that has been rapidly replacing formal care provision will not survive the COVID-19 pandemic, with a significant long-lasting impact on the lives of people with disabilities. More hopefully, many small community organizations, and new networks of volunteers, have been practicing 'personal and collective acts of care', providing practical and emotional support for people with disabilities in local areas in the midst of the pandemic (Sparke and Anguelov 2020; Yarker et al. 2020). As the current crisis eases, there will need to be a comprehensive review of social care and support, in particular its financial and logistical sustainability, the role of technology in provision of care, and further, the necessity to involve people with disabilities in this process (Disability Rights UK 2020a).

As geographical studies have demonstrated, there is long-standing, persistent, and deeply embedded discrimination and social and spatial exclusion experienced by people with disabilities. COVID-19, as with any crisis, has exposed and exacerbated these exclusions (Inclusion London 2020). For example, people with disabilities are less likely than those without disabilities to be in paid employment (and even more so for people with intellectual disabilities), and when in work, are more likely to be on temporary and/or part-time contracts, and further are over-represented in the retail and hospitality sectors (Disability Rights UK 2020b). The economic

and employment fallout from COVID-19 is such that these jobs are the ones most likely to be lost. The forthcoming severe recession will undoubtedly significantly reduce the opportunities for inclusion of people with disabilities in paid employment; in addition, many of the volunteering positions occupied by many people with disabilities have been suspended and will be slow to recover as organizations struggle in the post-COVID world (as noted above). For those people with disabilities employed in service sector jobs, where home working has become the 'new normal' in response to COVID-19, increased flexibility—and perhaps more importantly, heightened awareness of the need for flexibility in working hours, caring responsibilities, people's broader/complex needs to sustain their well-being in their jobs, and employers realizing how many employees they have with a range of needs, and their responsibilities, legally and otherwise, to support them—has provided opportunities for people with disabilities who face challenges with commuting and access to and within office spaces. Long-standing discussions about the need for flexible, home-based working have been accelerated by COVID-19 and enabled by enhanced communication technologies. However, this assumes that employers are adequately responding to the needs of employees in relation to equipment and accessible technology; further, it can strengthen assumptions about who 'should' be working where, and with people with disabilities absent could postpone efforts to make workplaces accessible.

COVID-19 has transformed social environments, with communities, streets, and public spaces emptied of people during the lockdown period; as restrictions ease, rules regarding social distancing, social gatherings, and wearing of masks will almost certainly remain in place. Geographical studies have highlighted the relative absence of people with disabilities in public spaces, and the physical inaccessibility and social attitudes that drive this (Hall 2019a); lockdowns and shielding have further removed people with disabilities from these spaces, with the potential that the often hard-won access and inclusion will be lost when 'normal' life resumes. Redesigning public spaces to facilitate social distancing has enhanced accessibility for some people with disabilities. For others, including those with visual impairments, and some with intellectual disabilities, one-way systems and restricted parking, rules on social distancing, and restrictions on 'tactile contact', can be challenging (Senjam 2020); for D/deaf people who use lip-reading, compulsory mask wearing has been exclusionary. Further, people with disabilities experience significant levels of hate crime (Hall 2019b); there is evidence that COVID-19 has led to some people with disabilities in public spaces being labelled as 'virus spreaders', including some incidences of those not wearing masks for health reasons being subject to harassment (PA Media 2020). For people with disabilities who are subject to 'interpersonal violence' in their homes, there is evidence that lockdown has increased the risk (Lund 2020).

The participation of people with disabilities in both research to understand the impacts of COVID-19 on health and society, and in devising responses to the pandemic, is crucial for building an equal and inclusive post-COVID-19 future, for people with and without disabilities. Geographers of disability are well placed to make a significant contribution: in the analysis of incidence of the disease, mapping

the dynamic landscape of health and social care provision, listening to and interpreting the experiences of people with disabilities in transformed social and physical environments, recognizing both people's vulnerability and their skills of resilience, highlighting accounts from people with disabilities internationally, in particular in countries in the Global South, where the pandemic is having a major impact, designing new arrangements for employment and accessible community and public spaces, and developing innovative and accessible online research methods in co-production with people with disabilities.

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Chapter 47
Participatory Research By/For the Precariously Housed in a Time of COVID-19

Jeff Masuda, Audrey Kobayashi, and The Right to Remain Collective

1 Introduction

Activist participatory research can play a role in supporting organizing efforts for the unhoused and precariously housed during the COVID-19 pandemic. We write from the Right to Remain Collective, in place in the Downtown Eastside of Vancouver BC since 2012, located on unceded Musqueam, Squamish, and Tsleil-Waututh territories. Our collective is made up of academics, community organizers, arts and culture organizations, students, and most importantly, tenants living in single room occupancy (SRO) buildings. We have engaged in several studies that have used mixed-method and humanities-aligned participatory research to address the injustices behind concentrated poverty, healthcare failure, and inadequate or non-existent housing. The 'right to remain' states our commitment to advocate for the provision and improvement of safe and adequate housing conditions in place.

Since before the arrival of the COVID-19 pandemic to Canada, we have followed and supported a rapid organizing response to help prepare SRO tenants for self-isolation, observing that the community's ability to fill critical gaps in the sudden crisis response stems from years of research-enabled capacity building. But the COVID-19 pandemic has only heightened systemic public health challenges related to housing and health that have developed over a century (Masuda et al.

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forthcoming, 2015; Andrews 1986; Wade 1997) and are rooted in the social effects of colonialism and systemic oppression. Although early organizing, helped by the Downtown Eastside's (DTES's) relative isolation from the rest of the city, slowed COVID-19 cases in the first wave, the onset of the second wave beginning in October 2020 has brought high rates of transmission and several deaths at the time of this writing in mid-December. The struggle to stave off infection is now desperate, and the impact upon lives that were already close to the margin of existence is intense. Physical distancing is next to impossible in crowded SROs or among people whose only home is on the street. As local facilities, including food banks and soup kitchens, shelters, healthcare services including needle exchanges, have closed down, access to food, shelter, and healthcare has all but disappeared. Below, we report on insights from research conducted with members of the collective who have shifted their activities in order to provide food, sanitation, Indigenous medicines, safe water (even drinking fountains are shut off), masks, and much-needed information, to name a few basic pandemic provisions. We cover: (1) changing conditions on the streets of the DTES, (2) activities of the volunteer team members, (3) creative/artistic responses to COVID-19 conditions, and (4) daily challenges and well-being of the volunteer team members. Overall, the chapter offers insight into the crucial role that researchers can play in directly leveraging support for the community-based pandemic response in the face of ongoing socio-spatial injustice.

2 Seven Years of Established Activist Research

Our larger research is multifaceted. In 2014, we established a research relationship with the SRO collaborative (SRO-C) located in Vancouver's DTES. Since then, we have mounted a series of participatory projects (Franks et al. 2015, 2017; Masuda et al. 2015, 2020). Our investigations into the SRO living conditions include surveys and interviews undertaken with local organizations and participant researchers, archival research into the historical formation of SROs, as well as making a connection to the historic Japanese-Canadian community that was uprooted from the district in the 1940s but that left behind many viable buildings that remain as today's SROs. With training and research by local residents, we are able to trace the political trajectory of public health efforts (or lack thereof) to address SRO living conditions while also directly supporting political movements to ameliorate housing conditions and to advocate for the rights of people living in the DTES.

Prior to our current emphasis on SRO organizing, we have brought attention to the historical antecedents of dispossession and resistance in the DTES through a series of highly successful arts projects, including graphic arts (Carter et al. 2015), documentary film (Masuda 2015), participatory street art of various sorts, and poetry. Local residents have led the projects to produce a variety of artistic expressions that depict life in the DTES and energize activism by restoring and enhancing their historical connection to place.

The most distinctive aspect of our research has been to use our skills and contacts to help SRO tenants organize politically. Their effort involves door knocking, and bringing people together (usually over food) to support one another, and where possible to recruit new participants to organize in their own SRO buildings, addressing concerns that range from the failure of landlords to provide safe and adequate housing, resisting evictions, and providing tenant-organized response to opioid overdoses. The latter effort involves the Tenant Overdose Response Organizers (TORO), a project run from the offices of the SRO-C that works building by building to provide peer training to tenants in the administration of naloxone injections and to ensure that tenants are knowledgeable about how to get help quickly when needed. TORO's efforts have significantly reduced the rate of opioid poisonings, even during the time of COVID-19.

In short, our participatory and activist research has allowed us to be a part of the empowering and powerful, inspirational, and effective efforts of a team of extraordinary volunteer SRO residents, and the remarkable local organizations that they have established to make the DTES more habitable.

3   Then COVID-19 Happened

With the onset of a worldwide pandemic early in 2020, it was clear that an outbreak in the SROs would be disastrous. Tenants are congregated in cramped quarters, sharing one toilet, one-shower bathroom facilities, often with more than a dozen neighbours. A high proportion of the population has underlying health conditions. Most live at or below the poverty line and have difficult or non-existent access to many services. Communication is difficult as few have access to the Internet, newspapers, or mobile phones. To make matters much worse, services began following mandatory orders to close down. These included shelters, needle exchanges, restaurants, bars, and any other setting where people congregate in close quarters. While these closures helped to slow the spread of COVID-19 in the first months of the pandemic, they also represent key lifeline services for people already living close to the edge. Within a few weeks of the March 2020 closures, the supply chain for opioids was compromised (resulting in the spread of adulterated product), and the rate of opioid poisoning, which had been on the decline because of groups such as TORO, began to escalate.

But thanks to the vast amount of organizational work that had been done over the past 6 years, the SRO-C was in a position to shift gears almost immediately and to begin to address the service gaps. Simultaneously, they applied for additional funding to assist their efforts, and began to coordinate tenants, about a third of whom are Indigenous, many of whom, especially in Chinatown, do not speak English, and many of whom did not possess telephones. The COVID-19 tenant emergency responders (CTERs), working through designated lead tenants, began to circulate information in 52 privately owned SROs (out of a total of 104), distributed free mobile phones, free food, medication, including Indigenized medicines, cleaning

and disinfectant supplies and masks, and information on a wide range of topics including testing sites, safer drug supplies, and individual needs such as repairs. Volunteers distributed food and supplies on the streets daily (Downtown Eastside SRO Collaborative Society 2020). This group literally created a lifeline for people who had nothing left to keep going.

The Right to Remain research collective began at the outset of the pandemic to document the process. From the beginning, we knew that inequities in access to basic communication (mobile phones, Internet) both undermined our team's effective capacity and placed our socially isolated SRO-dwelling colleagues at heightened risk. Once vital communications links were established via portable Wi-Fi devices, we have held regular checking and interviews with lead tenants and volunteers in order to chart progress and to establish a record of what is most and least effective. Our attempts to circulate information, both in the community and to key political actors and funders, have been continuous. Virtually all of our tenant researchers as well as on-the-ground staff members for both the SRO-C and the Right to Remain research collective have been involved. Some of us, as academics, are not located in the DTES, but we have nonetheless spent hours of time interviewing and meeting and coordinating via social media.

The methodology has involved four major elements: (1) education through circulation of information and train-the-trainer methods; (2) direct intervention through provision of food and supplies, application of an Indigenized Harm Reduction Model, and an SRO-based reporting and check-in system; (3) advocacy with all levels of government and a range of community stakeholders; and (4) documentation. The workers have faced challenges, including difficulties of communication, widespread disbelief that COVID-19 is 'real'; shortages of personal protective equipment and other key supplies; and the complicated effects of the disruption of the safe opioid supply chain. Nevertheless, the network that was already well advanced at the beginning of the pandemic proved remarkably nimble in shifting its focus to meet the needs of real people in a time of crisis, relying on established levels of trust and lines of communication and the developing skills of tenant researchers. They were able to provide services that could not be given by official agencies, and they became a crucial link between those official agencies and the people on the streets of the DTES. The SRO-C infrastructure has strengthened throughout the process with the implementation of train-the-trainer techniques that can in future be applied to other settings. There is an especially strong outreach system for Indigenous tenants, advocacy skills have advanced, and tenants are poised in general to play a strong role in helping to improve living conditions for all. And they are positioned in ways that traditional university researchers are not.

Through our outreach system and in listening to people talk about their experiences in interviews, it became deeply apparent that the effects of the pandemic are not only, or even mainly, about the risks of virus transmission. Rather, the risks occur because of the withdrawal of services that protect health, including mental health, as people have become more isolated. Many of the unhoused who have congregated in 'tent cities' have been repeatedly decamped. A majority of the escalating opioid poisonings have occurred among people alone in their rooms. Isolation,

lack of access to even to the usual level of healthcare, and even difficulties with the daily supply of food have created untold suffering as health—both physical and emotional—is compromised. Almost everyone has lost people close to them, and loss adds an additional layer of suffering.

All these issues are apparent in the particular housing environment of the SRO. And yet, the participatory, collaborative research, and service provision provided by the partnership between the SRO-C and the Right to Remain collective have made a difference. Our researchers have worked at all levels, on the ground through direct intervention, and at the municipal and provincial level through convincing approaches to housing and health authorities. Overall, as SRO-C Director Wendy Pedersen put it, these actions have resulted in organization 'to save lives and break down stigma and the impacts of colonialism' (Downtown Eastside SRO Collaborative Society 2020: 22).

4   Conclusion

Notwithstanding that our original research mandate had been slowed as a result of the pandemic, we are now in the ironic position of being better placed to continue and to accelerate our work on addressing stigma and the impact of colonialism and improving conditions for the precariously housed and unhoused people of the DTES of Vancouver. Our experiences of participatory research during the time of COVID-19 provide a number of key lessons that will inform our own future research and hopefully provide some suggestions to others embarking on such work. The first point is that developing the networks, infrastructure, trust, and expertise for truly participatory work does not happen quickly. In this case, every minute of work over the past 7 years led to the kind of nimble and effective response that we have documented. Second, there are myriad benefits to participatory research that involve the people most concerned with their own lives and with mitigating the circumstances that have profound effects upon their lives; they have knowledge, skills, and passionate commitment, all of which become a powerful force when organized effectively. Third, participatory research really can make a difference, from the bottom up, influencing everyday living on the one hand and public policy on the other. Finally, on a geographical note, place matters. The work outlined in this chapter could not have taken place without the deep human geographical knowledge of the local community, without the commitment to culturally appropriate actions taken collaboratively with SRO tenants in positions of leadership and respect, and without the commitment to this particular community, these particular buildings with their long history of providing shelter to our society's most marginalized, and this set of locally developed institutions. The SRO-C is emerging from the crisis having proven its credibility with government agencies, having affirmed the leadership of SRO tenants themselves, and having enhanced the Right to Remain. It is noteworthy that, among the outbreaks that have happened thus far in the DTES, the provincial public health authorities have confirmed to us that SRO residence has not been a contributing factor—a fact that we attribute to the work of the SRO-C.

For the future, our commitment to activist and participatory research remains resolute. Our agenda has certainly been affected by the pandemic but we are not deterred. Both our university and the SRO-C have received new funding to continue. Politicians (or a significant number of them) seem more aware of the need for increased and improved housing in the public and private sectors. The SRO-C is working with the City of Vancouver and the Province of British Columbia on a daily basis to address and strategize policy and funding gaps. The city has recently embarked on a project to purchase and renovate some of the most deteriorated housing. Decriminalization of illicit substances seems finally to be on the table. All of these promising developments constitute our agenda for future research, and we are well poised to be a part of the solutions.

Our project, built on 7 years of deeply rooted research and, at time of writing, nearly 10 months of involvement in COVID-19 mitigation, is set to continue, with both optimism and caution. Notwithstanding the wonderful efforts of on-the-ground researchers, burn-out is constant and increasing. Notwithstanding the efforts of TORO, the overdose risks from substance use remain; and, sadly, several tenant members of TORO have passed during this time. Notwithstanding recent governmental commitments, housing continues to deteriorate. Recovery may also be slowed by inevitable austerity measures in the aftermath of the massive deficits resulting from the pandemic. So, although the ability of tenants/researchers to play a positive role has been enhanced, if they are to bounce back, or bounce forward, we must all proceed with care.

Addendum: This chapter is dedicated to the community members we have lost and to the members of our team who have lost family and friends during the time of COVID-19.

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The Right to Remain Collective   is the research arm of the grassroots Downtown Eastside SRO Collaborative. The collective has been sustained through several research grants held by the authors as well as other academic researchers since 2014. At the time of this writing, the Right to Remain includes: Dani Aiello, Aaron Bailey, Nicole Baxter, Nick Blomley, Marina Chavez, Tom DeGray, Sarah De Leeuw, Erica Grant, Bryan Jacob, Wendy Pedersen, Maggie Ramirez, Carlos Sanchez, Richard Schwab, as well as several representatives of community organizations that have partners with the Collective over the years.

Chapter 48
Mental Ill-Health and Anxious Pandemic Geographies

Louise Boyle, Hester Parr, and Chris Philo

1 Mad Covid Geographies

> I think it's been very strange how there obviously has been more talk around mental health, around how people are coping with isolation and lockdown, but there doesn't seem to be any much conversation about actually mentally ill people, which, it's not surprising in a way because it's always been like that. (Sam in Mad Covid, 2020)

These words come from the Mad Covid blog established in the first half of 2020 to document the impacts of COVID-19 on people *already* experiencing mental health problems. While there has been growing attention to adverse mental health implications arising for whole populations undergoing COVID-induced socio-economic dislocation, much less has been recognised about the situation of those already suffering mental ill-health and likely relying on a diversity of services, networks and communities, formal and informal, to sustain mental equilibrium. Through its 'diaries', 'voices' and research, the Mad Covid blog seeks to remedy this absence, and our chapter is inspired, however partially, to do the same.

We seek to introduce geographical dimensions into the equation, the hinge for which is taking seriously spatialities of separation that are central in at least two ways to what we might term, taking our cue from the blog, as 'Mad Covid geographies'. On the one hand, there is the acute separation of person and world often striating the psyches of people with mental health problems, leaving them feeling dislocated from and anxious about it. Here, COVID-19 presents an additional threat, bringing with it

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the uncertainty of exposure to and spread of the virus while balancing concerns about maintaining physical distancing and the consequences of social isolation—demands bending in the winds of changing government policy. On the other hand, there is the long history of people with mental health problems being subject to forcible or coerced separation ('lockdown') from the everyday world of human interaction, often consigned or 'sectioned' to inpatient settings of one form or another, or at least decanted into set-apart 'community' spaces (group homes, sheltered accommodation, day centres, drop-ins). It has become painfully obvious that those resident in or needing to access services from more-or-less institutional settings have been particularly vulnerable to infection, creating spatial frontlines in the struggle against COVID-19 that spiral beyond the obvious ones—hospital intensive care units—to include care homes, prisons and the modern descendants of the 'lunatic asylum'.

2   Cholera and the Asylum

> In our last Report we adverted to the fact that epidemic cholera has made its appearance in several private asylums near London. … Subsequently, in its course over the country, it broke out in several asylums, and in some places was attended with great mortality. (CoL 1850, p. 17)

During the 1800s, Britain was ravaged repeatedly by cholera, an infectious, often fatal, disease causing acute diarrhoea and dehydration, and 'lunatic asylums', forerunners of mental hospitals and psychiatric inpatient facilities, were particularly susceptible to outbreaks. Often housing substantial numbers of patients in relatively crowded and unfavourable conditions, they were ready incubators of the disease. They could become hotspots of cholera, featuring prominently in tables and maps of cholera outbreaks (Kearns 1985) and contributing to the so-called urban penalty/ graveyard effect of emerging conurbations (Reher 2001, p. 105). As Wilson (2020, n.p.) remarks in a piece explicitly drawing lessons for our COVID-19-present from the asylum-past, there are 'haunting parallels' between cholera deaths in nineteenth-century British asylums and COVID-19 deaths in UK care homes during the 2020 pandemic, both being spaces wide open to waves of infection so easily breaking over their walls. In the first phase of the pandemic, negligent Government guidance on hospital discharges and testing strategies and shortages of Personal Protective Equipment (PPE) resulted in 35,500 excess deaths in care homes in England (Hodgson et al. 2020). Wilson adds, 'the vulnerability of institutionalised populations was not only foreseeable [in 2020]; doctors during the 1849 cholera outbreak tried to pass down lessons to future generations' (Wilson 2020, n.p.).

Cholera in the asylum was indeed a serious threat: in 1849, the Yorkshire County Asylum at Wakefield 'was invaded by Asiatic cholera' (CoL 1895, p. 91), the violent metaphor being telling; while Dr. Alexander McIntosh, Resident Physician at the Glasgow Royal Asylum, Gartnavel, was prepared to incur debts 'in order to ward off the disease … [o]therwise, I suppose 50 of them [patients] would have been swept away by cholera, instead of 3 or 4' (RRLC 1857, p. 495). When it struck, it could be a killer: at the Lancashire County Asylum in 1833, cholera accounted for 96 out of 147 (65%) deaths (RoN 1836, p. 10), while a survey

Appendix (C).

PART III.—STATISTICS OF CHOLERA.

ASYLUMS	Number of Patients in the Asylum at Outbreak of Cholera.					Number of Patients Attacked.					RESULT.								
	Private.		Pauper.		Total.	Private.		Pauper.		Total.	Recovered.				Total.	Died.			Total.
	M.	F.	M.	F.		M.	F.	M.	F.		Private M.	Private F.	Pauper M.	Pauper F.		Private M.	Pauper M.	Pauper F.	
Peckham House 1848	24	38	103	249	504	–	–	9	33	42	–	–	6	20	26	–	3	13	16
Peckham House 1849	23	39	183	230	475	–	1	20	15	36	–	–	4	5	0	–	16	10	27
Grove Hall, Bow	5	5	130	258	407	–	–	4	22	20	–	–	1	14	15	–	3	8	11
London House, Hackney	15	13	–	–	28	1	1	–	–	2	–	–	–	–	–	1	1	–	2
Althorpe House, Battersea	4	6	12	22	44	–	–	3	5	8	–	–	–	2	2	–	3	3	6
Bethnal House, Bethnal Green	90	106	163	109	567	2	8	19	31	60	1	1	1	3	6	1	18	28	54
Camberwell House	9	5	125	103	532	1	–	10	12	23	–	–	1	4	5	–	9	8	18
St. Marylebone Infirmary (Lunatic Wards)	–	–	26	47	73	–	–	4	–	4	–	–	–	–	–	–	4	–	4
St. Luke's Hospital	70	120	10	10	210	5	5	–	1	11	1	4	–	1	6	4	–	–	5
Cowper House, Old Brompton	37	–	–	–	37	4	–	–	–	4	1	–	–	–	1	3	–	–	3
Hoxton House	38	74	117	166	395	–	3	7	29	30	–	1	4	13	18	–	3	16	21
Kingsland Asylum, near Shrewsbury	9	8	37	30	84	–	–	11	2	13	–	–	2	–	2	–	9	2	11
Vernon House, Briton Ferry	9	7	99	66	151	–	–	4	5	9	–	–	2	1	1	–	4	4	8
Hull Borough Asylum	–	–	38	35	73	–	–	3	6	9	–	–	2	3	5	–	1	3	4
Bristol Asylum	–	–	30	49	79	–	–	6	6	12	–	–	3	4	7	–	3	2	5
Wrekenton Asylum, near Gateshead	7	4	14	12	37	4	3	9	7	23	1	–	1	5	7	3	8	4	18
West York Asylum	–	–	290	324	633	–	–	70	63	133	–	–	17	18	35	–	53	45	96
TOTAL	349	425	1,452	1,800	4,116	17	21	179	237	454	4	6	42	91	143	13	137	146	311

Fig. 48.1 Table showing 'Statistics of Cholera' based on Commissioners of Lunacy survey conducted in 1849–1850. (Source: CoL 1850, Appendix C, from p. 48)

undertaken by the Commissioners in Lunacy following the 1849 epidemic, covering 16 asylums of varying category, size, and location, reported 311 deaths in total due to cholera (Fig. 48.1). Over 7.5% of the pre-cholera patient population of these asylums died and, tellingly, the toll fell disproportionately on 'pauper' patients (without means and supported by the public purse) compared to 'private patients' (with fees paid from family finances). The former comprised 81.2% of the initial population but accounted for 91.6% of those 'attacked' and 91.0% of those dying, a death headcount of circa 30 *more* than if the disease burden been distributed evenly by social 'class'. Similar class-based disparities in COVID-19 infections and deaths have been observed and critiqued (see ONS 2020).

The official documenting of cholera at the asylum was entirely centred on the deleterious physical effects of the disease, including death. Virtually nothing was said about how cholera might affect the *mental* health of patients, nor how it might interact with pre-existing mental disorders, save for a hint about the disease preferentially picking out 'chronic' (long-term) cases or, if visiting 'recent' (short-term) cases, 'the symptoms of cholera seem to have supervened on a state of exhaustion following maniacal excitement' (CoL 1850, p. 49). Glimpses that cholera might *itself* have a deleterious mental influence can be found, however, in a table of figures provided by the York Retreat—perhaps the most significant institution in the British story of 'asylum geographies' (Philo 2004, Chap. 6)—concerning patient deaths. Here, for one patient recorded as having died of 'Sudden Fright', an asterisk leads the reader to a note under the table that clarifies 'Fear of cholera' (SA 1844, p. 60). This scrap of archival evidence leads us into the next part of our chapter, considering a rather different articulation of infectious illness and mental ill-health.

3   COVID-19 and Contemporary Geographies of Anxiety

Mainstream media is currently awash with accounts of COVID-19's impact on UK public mental health, across all demographics. Forecasts anticipate a 'tsunami' of mental illness in the wake of the pandemic as a direct consequence of the virus and the restrictions imposed by so-called lockdown and physical distancing measures (RCP 2020). Public health messages note the likelihood of experiencing increased anxiety and depression, which may be completely normal, and not pathological, reactions to an extraordinary situation (PHE 2020). Those directly impacted by intensive physical care are deemed more likely to experience clinically defined PTSD in the longer term (NHS England 2020). Whether these effects are clinically significant or not, there has still been a reported 10–15% rise in antidepressant prescriptions during lockdown (Sharma 2020), causing supply and pricing issues for pharmacies. We should, of course, exercise caution towards the blanket labelling of all pandemic-associated distress as mental illness (Johnstone 2020). While there is much debate about the mental health of the general population in the pandemic, less attention has been paid to those with pre-existing mental ill-health conditions, as the *Lancet Psychiatry* stated:

> … there has been far too little space dedicated to the status of those with severe mental illness who would usually receive community support, or on the problems faced in inpatient mental health units … . (*Lancet Psychiatry,* Editorial, May 4, 2020)

How might a geography of mental ill-health critically respond to these emerging issues? Analysis could point out macro-inequalities relating to risks of mental ill-health that might set certain people apart from other publics, notably, for example, the disproportionate numbers of Black people who are detained by the Mental Health Act in the UK, and also face an increased risk of transmission, morbidity and mortality due to COVID-19 (PHE 2020). There are complex issues here about pre-existing mental health stressors, racisms and inequalities. However, in order to comment on anxious pandemic geographies, this chapter focuses specifically on contemporary inpatient units and those already experiencing anxiety and related conditions pre-pandemic.

Much like concerns raised by the nineteenth century Lunacy Commissioners, there is a twenty-first century focus on the material environments of contagion in mental health units. Between March and June 2020, deaths of people detained in care facilities under the Mental Health Act were more than twice that of the same period the previous year, with half of cases attributed to COVID-19, which is particularly concerning as these are some of society's most vulnerable (CQC 2020). This emphasis on at-risk populations is accompanied by a concern with inpatient vulnerability and how physical distancing measures impact those with pronounced mental ill-health:

> … the use of protective clothing and masks might inadvertently appear threatening to patients experiencing emotional distress and paranoid thoughts, as well as hampering the communication techniques that might otherwise build trust and a positive therapeutic relationship. (*Lancet Psychiatry*, Editorial 2020)

There is a concern for patient distress accompanying the containment measures designed to reduce transmission:

Many patients lack the emotional regulation to process why last month we seemed present, and now we are distant. Those who are floridly psychotic lack insight; add a global pandemic to entrenched belief systems and you have a perfect storm. Some believe coronavirus is a conspiracy; some think it is biological warfare; some are convinced it is staged. Some see messages in news broadcasts meant for them. In psychosis, beliefs are so fixed there is no shifting them. Patients do not believe what we tell them is real, they believe their version is real. (Anonymous 2020)

Staff made clear the impact of lockdown on inpatient populations suffering further distress, confusion and lack of liberty in difficult circumstances. The socio-spatial isolation that has been a necessary part of UK lockdowns is also deemed more problematic for patients with reoccurring psychosis who might lack stable connections to consensual reality whether resident in hospital or not (Kotchena 2020).

It is not only staff-patient proximity and psychosis that is concerning for inpatient units, but also threats arising from *who* was getting to use valued green spaces around residential treatment facilities (often deemed therapeutic by staff and patients (Parr et al. 2003)). Indeed, during COVID-19 clinical staff at Glasgow's Gartnavel Hospital have felt moved to post on local social media their concerns about public use of the grounds:

Since lockdown began I have seen what feels like an ever increasing number of people who think the Gartnavel grounds are a perfect spot to take their exercise. Under normal circumstances it's great that people access them. Community engagement is a laudable idea. However … I do wonder whether some of those who come into the grounds are considering those who are currently stuck here. Our patient population have had to adapt to having all their group activities outwith the grounds cancelled, those we can offer within the hospital severely curtailed, visits are not allowed and time out of the wards limited. Like everyone else we are trying to adapt but it's very difficult to keep people inside and onside when the place is jumping with folk walking dogs, going for cycles, playing tennis(!) … Maybe think about finding somewhere else to stretch your legs if you can. It would be much appreciated.
(Jordanhill Watch Facebook post, April, 2020)

Gartnavel Hospital is surrounded by green space, and for years the institution has encouraged its neighbours to use the grounds and feel welcome 'over the wall' (McGeachan and Parr 2019; Hodgson et al. 2020). The suggestion of putting the walls back up reverses a good half-century's trajectory away from 'closed spaces'.

For those outside of residential care environments, the implications are different but extremely challenging, with one expert body pointing out that access to adequate mental health care was difficult enough before the pandemic, and that for those with added financial burdens things may be reaching crisis point (Mental Health Foundation 2020). The pandemic also has profound implications for those who already manage severe anxiety and obsessive-compulsive disorder (OCD) through distancing and management practices (Boyle 2019). The containment measures implemented to reduce pandemic progression can themselves reinforce intrusive and distressing thoughts and worsen symptoms (Davide et al. 2020). The high levels of pre-pandemic fear of contamination and the importance given to personal hygiene mean that general guidance may have a profound, psychological and emotional impact.

Peter Goffin (2020) writes about how, as someone with OCD, he has 'spent almost 20 years practising for the coronavirus pandemic', a sentiment repeated regularly on social media by people who have long experienced deep anxiety about physical boundaries and biohazards:

I recognise a lot of my own tendencies in the new global culture of coronavirus. But what I recognise most of all is the constant, unquenchable anxiety that comes from never really being satisfied that you're safe from infection. (ibid.)

Contamination is one of the primary fears associated with OCD. The pandemic has reworked existing anxieties and intrusive thoughts around viruses and infection, which have been further exacerbated by media reports and a lack of access to mental health care (French and Lyne 2020). While there may be familiarity for many in the current guidance, the reality is physically and mentally draining with possible escalations in rigorous protective routines against contamination.

For those routinely engaged in ritualistic responses and self-isolation to feared situations there is some hope that ongoing restrictions will prompt the public to 'be a bit more tolerant of people with this illness' (BBC News 2020a). As Dr. Andrew Iles (Priory Group) states in a BBC series on OCD and COVID-19, people who have had treatment, including cognitive behavioural therapy, have been encouraged to think their fears about the world exaggerated and the assumed risks psychologically greater than 'real' risks. COVID-19 has fundamentally challenged this basic premise of anxiety management and therapeutic rationality. As lockdown lifts, people with anxiety and with OCD may find the re-occupation of public spaces particularly hard. For Seaneen, who felt her anxiety ease at the beginning of lockdown, the anxiety is now rising with the thought what comes next: *'I can't remember what it feels like to be at ease around people. I can't remember not knowing what the words "social distancing" meant'* (BBC News 2020b).

4   Conclusion

Links run between the concerns of the nineteenth-century Lunacy Commissioners and those in charge of twenty-first century psychiatric inpatient units in terms of limiting infectious disease, although thankfully the latter—from our UK knowledge—have not seen the deaths witnessed previously due to cholera (although residential care homes have fared badly). A critical geography might regard the old asylums and the new inpatient units (and care homes) as loosely equivalent spaces of 'abandonment', receptacles of expendable 'surplus populations' (Tyner 2013), and persuasive claims are indeed being made about *who* and *where* gets abandoned under COVID-19, including by geographers (e.g. Hannah et al. 2020; Olsson 2020). We would caution against too scattergun a critique, however, since—as is clear from several instances discussed above—those staff (psychiatrists, nurses, even administrators) directly responsible for running today's mental health facilities are often doing their upmost to protect their charges from COVID-19 as it threatens their health somatically and psychologically. Sometimes that has meant trying to reimpose older separations, between 'asylum' and city, that had become blurred during a more recent deinstitutional era, precisely to seal sites against the infectious enemy at the gates. There is hence concern shown *for* the psychological trauma and distress caused by infectious disease, with mainstream media now rendering visible the individual experience of such 'dis-ease', even if the Mad Covid objection—that those already enduring mental ill-health remain relatively invisible—retains

validity. Post-pandemic geographies of mental ill-health might therefore involve a sustained research agenda that takes seriously the material worlds and world views of people with already pronounced mental health problems, some but not all of whom may already have received clinical diagnosis. We caution an approach that serves to individualise and depoliticise people's responses to the pandemic and the social problems that are still emerging from it (Johnstone 2020). This group is already disadvantaged socially, financially and materially, and critical health geography should appraise the geographies of severe mental and emotional distress—and the changing, often curtailed support landscapes—that COVID-19 has precipitated or exacerbated for them.

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Chapter 49
COVID-19 and Health Professionals: Recommitting to a Global Health Agenda

Margaret Walton-Roberts

1 Introduction: The Global Pandemic Reaffirms Global Health Agendas

The coronavirus pandemic has reasserted the importance of the "one world-one health" research agenda for multispecies health (humans, animals and the planet) and refocused our attention on planetary ecological decline driven by modern economic and political practices (see one health chapter). The consequences of the pandemic reflect and exacerbate existing societal inequality, and strengthen the case for global action to enhance human life as articulated through the aspirational agenda of the Sustainable Development Goals (SDGs). SDG 3 "Good Health and Wellbeing" is central to all the multi- and inter-sectoral goals that comprise the ambitious plan of action for people, planet and prosperity (see well-being chapter). Health care professionals are central to achieving the SDGs (WHO 2016a). This chapter reviews the global realities regarding health workers exposed by the pandemic. Health geographers have not fully recognized the significance and the rich potential fields of analysis that accompany a focus on health care workers (Connell and Walton-Roberts 2016). The COVID-19 pandemic has reasserted the importance of attending to this issue.

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2 Health Care Workers

Health systems include human health resources—that is, the number, qualifications and distribution of appropriate health workers. Numerous studies show evidence of a direct and positive link between numbers of health workers and population health outcomes (WHO 2009). The health and social sector employs over 234 million workers globally and is one of the largest and most rapidly growing employment sectors, especially of women (Boniol et al. 2019). Labour market globalization and international comparison have led to a demand for standardization and agreed upon definitions for occupations. Reflecting the intersectional and broad scope of health, the range of health related professions is vast; including sub-professions and allied health workers. Table 49.1 presents the International Standard Classification of Occupations 2008 (ISCO-08) of medical professionals and the related occupational groups coded in other subgroups. In light of the call from one health advocates, it is important to note that veterinarians are also considered part of the medical professionals. Interaction across occupational silos is central to achieving one health objectives, and in the past the animal and human health professions were far more integrated (Jørgensen and das Neves 2020).

Table 49.1 International Labour Organization International Standard Classification of Occupations 2008 (ISCO-08)-Health Professionals Subgroup 22 (International Labour Organization (ILO) 2012)

ILO's International Standard Classification of Occupations 2008 (ISCO-08)		
Major subgroups of 22 medical professionals	Examples of occupations of minor group	Examples of health related workers in other subgroups
Medical doctors Generalists (2211)/specialists (2212)	General practitioner/ cardiologist	Biomedical researcher (2131)
Nursing (2221) and midwifery professionals (2222)	Public health nurse/ professional midwife	Nursing aide (5321)
Traditional and complementary medical professionals (2230)	Acupuncturists/Ayurveda practitioner	Traditional and complementary medical associate professionals (3230)
Paramedical professionals (2240)	Primary care paramedic/ surgical technician	Ambulance workers (3258)
Veterinarians (2250)	Veterinarian/animal pathologist	Veterinary aide (5164)
Other health professionals 2261–2269)	Dentists/environmental health inspectors	Health and sanitary inspectors (3257) Massage therapists (3255)

2.1   *Numbers, Location, and Distribution*

Providing the right number of workers, with the right skills in the right place, is the challenge of health human resource planning. There is an inverse relationship between the distribution of the global burden of disease and that of health workers.[1] The World Health Report 2006 indicated 2.3 skilled health workers (physicians and nurses/midwives) per 1000 population was considered the minimum necessary to attain high coverage (80%) of skilled birth attendance. The World Social Security Report 2010–2011 developed a "staff access deficit indicator" based on a minimum availability of 3.4 skilled health workers per 1000 population; subsequently updated to 4.1 per 1000. A "SDG index threshold" of 4.45 doctors, nurses and midwives per 1000 has been calculated as the minimum density needed to achieve the SDGs (WHO 2016a). Africa and Southeast Asia do not currently meet the SDG threshold (Table 49.2).

The national supply of health workers can be supplemented by recruiting internationally trained workers, but this presents a host of challenges including ethical concerns of poaching and brain drain and practical concerns of integrating professionals who have been trained in different national contexts (Thompson and Walton-Roberts 2019). Analysis of international health professional migration reveals the supply of trained health professionals is increasingly sourced from lower- and middle-income nations such as India, the Philippines, sub-Saharan African nations, and small island states in the Caribbean and South Pacific (regions with higher burdens of disease and lower ratios of health care workers). The international mobility of health care workers exacerbates already existing health inequalities and has long been the focus of global organizations concerned with health, development and social justice, resulting in a global social policy field on health worker migration and recruitment emerging in the 1970s under the leadership of health and labour international organizations (Yeates and Pillinger 2019).

Table 49.2 Health care worker density, shortages by 2030, and global disease burden

World region	Health workers per 1000 population (WHO 2016a)	Estimated shortage of all health workers by 2030 (in millions) (WHO 2016b)	Global disease burden, disability-adjusted life years (DALYs 000) (WHO 2018)
Africa	2.2	6.1	598,615
Americas	9.6	0.6	286,872
Southeast Asia	3.3	4.7	712,522
Europe	14.0	0.1	300,416
Eastern Mediterranean	4.9	1.7	251,108
Western Pacific	5.6	1.4	510,444

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[1] The global burden of disease can be represented by Disability-Adjusted Life Years (DALYs), which quantifies the number of healthy life years lost due to morbidity and mortality, permitting comparison of diseases and risk factors geographically.

To fight the global pandemic, many high-income nations are already calling upon what is effectively a global health workforce comprised of migrants. Migrants comprise 29% of physicians and 22% of nursing assistants in the United States, where over 29,000 Deferred Action for Childhood Arrivals program recipients work in health care positions.[2] In the United Kingdom, 13.3% of NHS workers report a non-British nationality. In Canada, in 2018, 8.5% of nurses and 26.4% of physicians were internationally educated (Walton-Roberts 2020).

2.2   *Training*

National governments provide the structures for education and create the taxation and investment contexts that support or deter public and private actors from engaging in the provision of training; they also create the contexts for professional assessment and licensing. Specialized health workers require several years of training, so national or subnational responsiveness often lag behind health and population transformations. For low-income nations, we must also add the uneven global burden of disease, accelerating emigration of health care workers, and chronic underinvestment in health, all of which create a highly uneven landscape for health worker governance and protection (Joint Learning Initiative 2004). This unevenness extends to international migrants who face credential recognition barriers and often work in positions not commensurate with their training. This brain waste has received sustained policy attention (Bourgeault and Neiterman 2013).

During the coronavirus pandemic, the rigidities of health professional training and licensing received public attention as governments sought to expand the ranks of frontline workers. In North America, this included calling in retired health workers, accelerating the graduation of new health workers, and using emergency disaster laws to fast-track permits for regulated health professionals to move between jurisdictions. In India, the country with the highest number of medical schools, researchers argued the Medical Council of India (MCI) could add 50,000 specialists in anaesthesiology, pulmonology, cardiology and radiology, by recognizing Indians who have foreign medical credentials or who graduated from schools that for various reasons are not recognized by the MCI.

2.3   *Hierarchy and Collaboration*

The health sector is marked by numerous occupational and sectoral hierarchies that have variable influence on workplace interactions depending upon geography, gender, speciality, and sector (public/private). These hierarchies are gendered, racialized, and spatialized, and immigrant workers are disproportionally employed in

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[2] DACA provides temporary protection from deportation to qualified individuals brought to the USA illegally as children.

more demanding, less prestigious occupations such as gerontology and in non-regulated and lower-paid work such as personal support workers or health aides (Walton-Roberts 2020). Workplace hierarchies can undermine care.[3] Increasingly, advanced medical practice promotes much greater inter-professional health care teams, where different groups of health workers collaborate in patient-centric approaches, during COVID-19 such "village" approaches to care improved outcomes (Brandt and Chou 2020).

Gender is a key factor in health professional hierarchies (also see the gender chapter). In most countries, male workers make up the majority of physicians, dentists, and pharmacists, and women health workers earn 28% less than male health workers (Boniol et al. 2019). Nurses represent the largest occupational group in health globally, two-thirds of whom are women, and their role is fundamental to achieving various global health and development strategies. Females also provide the majority of unpaid care work that is central to social welfare. The Global Health Workforce Network was established by the World Health Organization in 2017 to bring key stakeholders together in order to strengthen data and evidence to support gender transformative actions and investments in health to promote the "gender dividend" that would result from achieving the health SDGs related to education, training and employment of health workers. COVID-19 has reinforced the need to promote this gender dividend (Wenham et al. 2020).

2.4   Health Workers and COVID-19: Intersectional Risks

When the surge of COVID-19 patients hit hospitals, reports described a war-like environment, with staff exhausted, terrified and facing post-traumatic stress disorder as they coped with the horrific reality of having to ration life-saving ventilators. While health workers have been widely praised in various public displays of support, there have also been disturbing reports from the United Kingdom of National Health Service (NHS) nurses being subjected to discrimination and violence, and of nurses in the United States being evicted from their homes due to COVID-19 fears. Political policies can also harm workers, for example, health care worker burnout in the USA has been more appropriately viewed as "moral injury", since workers struggle to provide patient care in national health care systems broken by profit-driven models (Talbot and Dean 2018). Underinvestment in health and long-term care effectively undermined infection control and exposed health workers to increased risk (Walton-Roberts 2020). Frontline health workers are some of the most vulnerable during pandemics,[4] and the rate of infection and death appears to

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[3] A Military Task Force was used to control COVID-19 outbreaks in several Ontario LTC homes. The report highlighted several instances of staffing conflict and unpreparedness, including conflict between cadres of workers. Accessed July 8, 2020 https://www.macleans.ca/wp-content/uploads/2020/05/JTFC-Observations-in-LTCF-in-ON.pdf

[4] Amnesty international has been tracking data on health care worker infection and deaths linked to COVID-19 https://www.amnesty.org/en/latest/news/2020/09/mapping-covid19-health-worker-

increase with intersectional factors such as immigrant and minority status and by gender. Table 49.3 provides some country examples of death and infection rates due to COVID-19 for health care workers, including how this relates to intersectional factors such as gender, race, minority and immigrant status.

Table 49.3 Select national examples of health care worker COVID-19 infection and death rates, including partial information on intersectional factors such as gender, immigrant and minority status

Country	Approx. # infected health care workers	Number of deaths (All)	Available details including intersectional factors
Brazil[a]	30,000	634	325 nurses, technicians and nurse assistants included in number of deaths, and 64% of victims are women
Canada (Guttmann et al. 2020)		17	In Ontario, Canada, migrant workers in the health care sector, especially women, experienced higher rates of COVID-19 infection. Of all women who tested positive for COVID-19, over a third were health care workers, and of these 45% were immigrants or refugees
Germany[b]	13,000	71	Health workers in hospitals, outpatient clinics and practices, dialysis clinics or outpatient nursing services • About 15,000 infected • 600 health care workers hospitalized • 23 deaths Care workers for the elderly, disabled and other groups • 9671 infections • 412 hospitalizations • 49 deaths Among the cases reported as working in medical facilities, 73% were female and 27% male. Their median age was 41 years
Italy[c]	28,000	85	Infected health care workers include more than 28,000 in Italy, with 85 reported deaths
India[d]	87,000	573	307 doctors died among 2006 infected, 188 were general physicians
Mexico[e]	97,632	1320	Among the infected health care workers: • Nurses make up 42% • Doctors 27% Other hospital employees such as technicians, aides and maintenance and cleaning staff accounted for 31%

(continued)

deaths/

Table 49.3 (continued)

Country	Approx. # infected health care workers	Number of deaths (All)	Available details including intersectional factors
United States of America[f,g]		1079	Of 177 cases of deaths investigated: • 62.1% were identified as Black, Latino, Asian/Pacific Islander, or Native American • 30.5% were born outside the United States • The median age was 57 and ages ranged from 20 to 80, with 21 people (12%) under 40 • Roughly 38%–68%—were nurses, but the total also includes physicians, pharmacists, first responders and hospital technicians, among others At least 193 registered nurses in the USA have died of COVID-19 by August 24, 2020, 30% were Filipino
United Kingdom (UK)[h]		540 (England and Wales)	More than 60% of health workers who died are reported to be Black, Asian and minority

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[a]https://www.leftvoice.org/more-healthcare-workers-have-died-of-covid-19-in-brazil-than-anywhere-else-in-the-world 29 July
[b]https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/Gesamt.htmlhttps://www.epsu.org/article/health-workers-bear-brunt-covid-19-infections
[c]https://www.epsu.org/article/health-workers-bear-brunt-covid-19-infections
[d]NDTV, and Indian Medical Association
[e]https://www.latimes.com/world-nation/story/2020-09-03/mexico-leads-health-worker-deaths-covid-19 3rd September 2020
[f]https://www.theguardian.com/us-news/2020/aug/26/us-health-workers-covid-19-deaths-lost-on-the-frontline 26 August 2020
[g]https://www.nbcnews.com/news/amp/ncna1237327?__twitter_impression=true
[h]https://www.amnesty.org.uk/press-releases/uk-among-highest-covid-19-health-worker-deaths-world 12 July 2020

3 Conclusion: Re-commit to Global Health Agendas

The coronavirus pandemic has asserted of the importance of understanding health care worker geographies including training and education, distribution, and risks faced. WHO, together with other international organizations such as the ILO, have long recognized how essential health human resources are to public health (Yeates and Pillinger 2019). Wealthier countries have long enjoyed the fruits of international health worker migration, who have been essential in meeting health demands during the COVID-19 pandemic. Analysis of COVID-19 effects on health care workers has highlighted the importance of immigrant health care workers, as well as their intersectional vulnerabilities to COVID-19 infection and death. Witnessing how health systems responded to the pandemic, the intensity of the inequitable outcomes evident because of the disease, including the disproportionate rates of death and infection of women, minorities and immigrant health care workers, reinforces this research agenda.

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Chapter 50
Labour Geography, Racial Capitalism, and the Pandemic Portal

Ben Rogaly and Hannah Schling

The COVID-19 pandemic has been brutal in its effects. By the time of writing in October 2020, it had led to the deaths of over one million people worldwide. The devastation wrought by the pandemic has been experienced unevenly between countries, and, where death rates have been high, racialized and working-class people have been disproportionately impacted. In many countries, COVID-19 arrived on the back of four decades of "[n]eoliberal attempts at deregulating the labour market" and the associated "attack on the social and working conditions of labour" (Peck 1996: 2). The most recent of these decades, following the 2008 financial crisis, saw drastic cuts to public spending. These cuts to health, education, and local government budgets magnified the gendered effects of the pandemic; it tended to be women who stepped in to care for sick household members and to "homeschool" children.

Geographical perspectives on workers and workplaces must attend to sites of both paid and unpaid work and the relationships between them. Feminist political economic geographers have led the way in bringing social reproduction centre stage in the study of work (Dutta 2020; Schling 2017). As well as impacting workers and workplaces unequally along axes of class, "race", and gender, the pandemic also revealed pre-existing inequalities in new ways. It is possible that, through terminology such as "key" or "essential" workers, this will lead to a rehumanizing of people long dismissed or ignored as less than human. The sense of common humanity that could emerge might herald a new unity providing the basis for combating intersecting inequalities and other global crises, most notably climate change. As writer and activist Arundhati Roy (2020) puts it, the pandemic offers a

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portal, a gateway between one world and the next. We can choose to walk through it, dragging the carcasses of our prejudices and hatred, our avarice, our data banks and dead ideas, our dead rivers and smoky skies behind us. Or we can walk through lightly with little baggage, ready to imagine another world. And ready to fight for it.

The capacity for workers to struggle for better conditions or to go further and transform landscapes of capitalism has been a central concern of the field of labour geography since the pioneering work of Andrew Herod (2001). A central and much-debated concept for labour geographers is "workers' agency". With a geographical lens attuned to the contingency of space and time, the earliest research in the field concentrated on the collective agency of settled, organized workers in the Global North. Cognizant of the increasing power of capital relative to labour in the aggregate, this work tended to focus on the potential for specific groups of workers to make fundamental and long-lasting changes to landscapes of capitalism in their own interests. Subsequent contributions argued that the lens should include individual agency, mobile, and unorganized workers and the whole variety of global work situations. Although in many contexts structural inequalities meant that the odds were stacked against workers, this research highlighted the capacity for workers to make small, temporary changes such as having a laugh at the expense of an employer. While non-transformational in any broader sense, it was argued that such small acts were considered significant by workers themselves and could enhance their subjective well-being (Rogaly 2009). Some scholars and activists have further turned attention towards new grassroots initiatives organizing precarious workers, including cleaners in the public sector and workers in the gig economy, emergent in contexts such as the UK (e.g. Cant and Woodcock 2020). However, geographers drawing on labour process theory have rightly emphasized that people in paid employment working at the same site may see their interests as divergent (Hastings 2016). Racialized hierarchies promoted by wider society and made use of by employers can also be internalized and reproduced by workers against each other.

Critical analysis of such hierarchies is part of a wider engagement by geographers with the relationship between capitalism and racism (Strauss 2019). Geographer Ruth Wilson Gilmore argues that the two work in tandem, defining racism as "the state-sanctioned and/or extra-legal production and exploitation of group-differentiated vulnerabilities to premature death" (2002: 261). What became known through the work of Cedric Robinson and others as "racial capitalism" is conceptualized by Gilmore as "a mode of production developed in agriculture, improved by enclosure in the Old World, and captive land and labor in the Americas, perfected in slavery's time motion field-factory choreography…" (2017: 225–226). Building on earlier studies of temporary migration for factory work and on his own research, Rogaly (2020) has argued that the association of some kinds of dangerous, low-status, fast-paced, insecure work with racialized people or with foreign nationals is a feature of racial capitalism. Listening to biographical oral histories of workers in fields, food factories, and warehouses around the English city of Peterborough, Rogaly learned about continuities over time in terms of the use of racialized workforces, employment by temporary work agencies, harsh management regimes, and workers being housed in employer-provided and privately rented homes of multiple

occupations. Yet, as the proportion of people employed to work in warehouse and distribution work grew, what geographer Emily Reid-Musson (2018: 894) has called "intimate and predatory forms of exploitation" and "management through algorithms" became more established. Labour regimes intensified, with targets and sanctions used to speed up the pace of picking and packing work, and time spent on toilet breaks becoming subject to digital surveillance by supervisors. Workers reported a cavalier management attitude towards health and safety at work. Yet, the research also showed how more extreme exploitation also created conditions which sometimes united workers across differences of nationality, ethnicity, gender, and language. Sometimes this led to these largely non-unionized workers organizing informally to fight back against oppressive management practices.

The pandemic further exacerbated the class divide inherent in contemporary capitalist employment relations (Harvey 2020). In order to try to control the spread of the virus, many governments imposed "lockdowns" compelling people to stay at home. Migrant workers in India had their sources of livelihood removed by the central government's response to the pandemic. Living in temporary accommodation far from their families and support networks, many were hit by the extremely short notice of 4 h given before the imposition of the national lockdown and the subsequent shutting down of all public transport. Workers faced a stark choice of either walking hundreds of kilometres to try to reach home or facing severe hunger and even starvation (Samaddar 2020). In these and other ways, deaths from the effects of the pandemic were exceeding deaths from the COVID-19 virus itself.

Yet, for people whose livelihood depended on them continuing to travel to workplaces to keep the production and distribution of food and other goods moving, the pandemic has meant an increased risk of illness and even death from going to work. Debbie Samaniego and Felix Mantz (Samaniego and Mantz 2020) note how meat factories in the USA were deemed essential industries during the lockdown there. They report that one facility where 28% of workers tested positive was still not shut down. The plant is owned by JBS, the "largest meat-processing company in the world". Samaniego and Mantz demonstrate the racial inequalities in operation within the meat-packing plants. It is disproportionately people of colour who are forced by "precarious economic conditions… to work in dangerous and unhealthy environments". The pace of work and the speed required are critical factors in increasing the danger for meat-packing workers. Esther Honig and Ted Genoways's (2020) study of other JBS plants where workers have died from coronavirus suggests that even where "plastic or metal guards have been installed between workstations on the line", without slowing the line down and creating greater space between workers, this is likely to have little significant effect on the spread of COVID-19. Ironically, according to their study "being declared 'essential' during the pandemic carries few benefits for workers; instead, it allows employers to impose greater work requirements with fewer restrictions".

Yet, workers' agency in the form of resistance has also been evident in the wake of the pandemic. Samaniego and Mantz report a workers' demonstration in Logan, Utah, against the lack of action being taken by the company to protect workers' safety and reduce the risk of contagion. Local level action against unsafe workplace

practices was also taken by meat packing as well as warehouse and distribution workers elsewhere in the USA. In India, the Migrant Workers Support Network documented hundreds of localized acts of resistance by workers to the effects of the lockdown. While not directed explicitly at workplace justice, Black Lives Matter protests that erupted across the USA and in a number of other countries following the brutal murder of George Floyd by a police officer on May 25th, 2020 can be seen as having deeper causes that stretch back to the worst kind of workplace oppression: chattel slavery (De Genova 2020). The context of COVID-19 and the mix of job losses, poor prospects, and conversely feeling compelled to work in unsafe jobs is likely to have been a major reason for the protests being multiracial, spread across towns as well as cities, and lasting for many weeks, even several months.

As the mainly white, Anglophone and Global North-based discipline of geography begins to grapple with its own entanglement with colonialism and with racist ideology and racialized hierarchies, geographers writing on workers and workplaces are belatedly grounding their research in critical questions asked by the black radical tradition. The increasing "precarization" of academic work itself provides genuine grounds for solidarity on campuses and beyond between higher education workers, people engaged in insecure, precarious employment elsewhere, and others for whom employment as a source of livelihood is ever harder to come by. The questions asked by labour geographers in the past regarding the potential of workers' agency to contest the power of capital must, following the outbreak of the COVID-19 pandemic and all that has followed, now engage as an explicitly anti-racist project, both analytically and through acts of solidarity; attending to where and how exploitation operates through processes of racialization, and the ways racial capitalism drives workers to see their interests as opposed. It must bring its tools to bear to better understand and contest how time and space in the workplace are used in unsafe ways against workers' interests; and it must align itself with broader struggles for progressive change that contest racisms, gender, and class inequalities. In analysing labour's geographies in relation to broader societal change, labour geography can learn from the pandemic that it needs to move beyond the workplace alone—to centre questions of workers' social reproduction as vital to what compels workers to participate in unsafe work and what equips them to push back, in more and less organized forms of resistance. In approaching research as a resource for struggles against exploitation, including in participative processes sensitive to the precarity and insecurity workers grapple with, labour geography might find avenues for academics to act in solidarity with all those seeking a more just and equal future through the pandemic portal.

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Chapter 51
Geographies of (Domestic) Alcohol Consumption

Check for updates

Robert Wilton

1 Introduction

This chapter brings a geographic perspective to the question of alcohol consumption in the context of COVID-19. I give specific attention to the domestic consumption of alcohol in the context of the pandemic and the risks and pleasures associated with this practice.[1] On one hand, there has been concern about increasing domestic alcohol consumption, as people cope with the disruption or loss of a regular schedule, social isolation, and stress. Allied with this, there have been calls for tighter restrictions on sales of alcohol and public health messaging encouraging sobriety. On the other hand, much has been made of "Quarantinis", virtual happy hours, and the ways people are finding to drink alone or with others during the lockdown (Hubbard 2020). In what follows, I explore these competing perspectives on home drinking in the context of the pandemic. I look first at recent literature on the geographies of alcohol consumption before turning to consider current events, and how these events may shape the future.

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[1] I recognize that this is a necessarily partial account that is grounded in my knowledge of the English language social science literature on alcohol consumption and regulation and recent developments in countries of the Global North.

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2   Geographies of Alcohol

There has been a burgeoning interest in the geographies of alcohol consumption, regulation, and treatment in recent years (Jayne et al. 2016). Much of this scholarship has an avowedly critical orientation, aligning it with a broader current of social science research. A key focus in this regard has been striking a balance between the negative views of alcohol consumption that pervade public health policy and recognition of the pleasures attached to drinking. This is a critical balance to strike, recognizing both the harms that can arise from alcohol consumption and its significance as a social-cultural practice (Thurnell-Read 2016). A second, allied focus has been on the context of drinking. Scholars have explored the ways that the practices and meanings of drinking interrelate with the motivations and identities of drinkers and the symbolic and material character of places in which consumption occurs. Part of this work has involved exploring the "conditional" agency of alcohol itself (Lawhon 2013).

Despite the current interest in home drinking under COVID, research in the discipline has focused predominantly on alcohol consumption in public places, with particular emphasis on those sites that comprise the urban night-time economy. By contrast, the home has received little attention, despite the fact that domestic space is key site for alcohol consumption, and there is evidence of a decades' long trend in Canada, the UK, and other contexts away from licensed premises towards home drinking (Foster and Ferguson 2012).

Part of the reason for the lack of attention is that domestic space has been understood in fairly benign terms as a site for alcohol consumption. As Holloway et al. (2008: 544) note, even where harmful levels of alcohol are consumed, the fact that consumption is taking place in private means that people "are not breaking social or legal rules by being raucous, ill or violent in public space". Alcohol consumption is not as visible in the context of the home, and it this lack of visibility, coupled with the growing volume of alcohol consumed at home, that has prompted scrutiny from public health and allied fields in the past decade (Foster 2010).

However, not all home drinking is the same. Who is drinking matters a great deal to the experiences of consumption and the reactions these experiences elicit. Domestic space has been, and remains, a more important site for (some) women's drinking, reflecting the "gendered construction of socially appropriate leisure" (Measham and Østergaard 2009: 424). Similarly, why people drink and under what circumstances matter. Entertaining others is a key reason for domestic consumption, highlighting the central role of alcohol in home-based sociability (Holloway et al. 2008). Forms of social drinking may be viewed in relatively positive terms, even though the volume of alcohol consumed may be deemed harmful in public health terms. By contrast, drinking without visitors, especially alone, as a compensatory response to stress is viewed in more negative terms. These differences help us to understand the varied reactions to home drinking in the context of the pandemic.

3 COVID-19 & The Spatial Reconfiguration of Drinking

The pandemic and the lockdown have had profound impacts on geography of alcohol consumption. Closures of licensed establishments slowed or shut off the flow of alcohol to many public drinking venues, while the requirements to stay away from work and school disrupted routines and shifted the locus of daily life for many people to the home. While the World Health Organization (WHO) called on governments to toughen alcohol regulations, many people continued to have access to alcohol through retail outlets. In Ontario, for example, government-controlled liquor stores were deemed essential workplaces alongside grocery stores, with Toronto's Medical Officer of Health noting that "whether we care to admit it or not, there are many people in our community who have significant dependence issues with respect to alcohol" (Tsekouras 2020). Options to buy alcohol for home consumption increased in some jurisdictions as governments relaxed regulations concerning alcohol sales by restaurants for off-site consumption and home delivery. More broadly, the role of online retailing and home delivery of alcohol (Holmes et al. 2014) has accelerated under COVID-19. In political ecological terms, the net effect has been to spatially reconfigure the sociomaterial metabolization of alcohol (Lawhon 2013), sparking increased attention to the pleasures and dangers of home drinking.

With respect to the dangers, a key focus in the media has been evidence of more drinking as people find themselves off work and without regular routines. A CTV News article entitled "Stay sober': WHO's advice as Canadians drink their way through the pandemic" cited a Canadian Centre for Substance Use and Addiction (CCSA) poll that found some 20% of adults aged 18–54 years drinking more during lockdown (Flanagan 2020). Similarly, an article in The Conversation entitled "America is drinking its way through the coronavirus crisis" showed 25% of Americans adults drinking more during lockdown (Jernigan 2020). In the UK, results from the Global Drug Survey suggested more than 40% of adults who consume alcohol were drinking more and earlier in the day during lockdown (Grierson 2020).

Notwithstanding the hyperbolic headlines, these data raise concerns about the volume of alcohol consumed but also the circumstances of home drinking, and "the ambiguous and unpredictable effects" that emerge from domestic "alcoholic assemblages" (Bøhling 2015: 133). A key concern is that the lockdown means people are drinking (more) in the absence of contact with others; the sociability identified as a potential positive of alcohol consumption is lost. Drinking is understood in pathological terms as part of a "turning away from the social bond" (Proudfoot 2017: 2), with concomitant impacts on mental and physical health.

There is also an immediate concern about how the spatial reconfiguration of drinking negatively impacts relations within households. This is most acutely the case for domestic abuse. Crime figures released in cities across Canada, for example, contrast double-digit declines in impaired driving charges with double-digit increases in domestic complaints, including domestic violence, with a similar trend documented around the world (Graham-Harrison 2020). Highlighting the

"conditional" agency of alcohol, Paradis (2020) points to "the effect alcohol has on intensifying arguments between couples, reducing inhibitions, clouding judgment and impairing an individual's ability to interpret social cues".

Concerns also arise about the ways in which home drinking may impact children. The rituals used by parents to avoid drinking in front of children (Foster 2010) may be disrupted by the loss of a regular schedule. In this context, the WHO advises parents to: "make sure that children and young people do not have access to alcohol and do not let them see you consume alcohol – be a role model" (World Health Organization 2020). These issues overlay and impact gender inequalities that have been exacerbated by the pandemic. Women are more likely to be shouldering the additional work of childcare during lockdown, while struggling to work or facing loss of employment. The CCSA poll cited above found that Canadian women were almost twice as likely as men to cite stress as a reason for drinking more, while men were more likely to cite boredom. This speaks to the unequal division of unpaid labour and to specific gendered differences in drinking practices at home.

We find a very different reading of domestic drinking in many articles on how to host online cocktail parties and happy hours from your home during lockdown. For example, a *New York Times* article published in late March opened with the statement "The coronavirus has turned drinks at the bar into drinks in our individual homes, but that doesn't mean you have to drink alone" and offered a variety of tips for how to host a successful virtual happy hour (Goldfarb 2020). It is this focus on sociability and connections with others outside the home that gives the piece such a positive spin. In this framing, the domestic alcoholic assemblage is understood as a net good for participants:

> Not only does an evening "event" help give the day structure but seeing friendly faces can be a lifeline for people who miss their friends and loved ones.

The reference to the evening event conveys a sense of when it is appropriate to drink at home, while the author's warning that "shrieking kids" may spoil the vibe suggests that it is neither pleasurable nor appropriate, to drink with children present, something that may present particular challenges for women negotiating the stresses of life under lockdown.

Not surprisingly, the sociability afforded by videotelephony has also been a popular focus for alcohol producers. A recent Heineken commercial lampoons the technical difficulties people face in their efforts to drink with others online.[2] The tagline "It's not the best get-together, but it's the best way to get together" frames the online setting as an imperfect – but essential – substitute for in person social events. In California, Napa Valley wineries are offering to ship wine to customers' homes and provide private Zoom tasting sessions for individuals or groups. A Washington Post article characterized the virtual tastings in the following way: "As April drags on into forever, a little wine-fueled fun is something so many of us could use" (Silver 2020). Again, the pleasures of domestic drinking are linked to the connections

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[2] See https://www.youtube.com/watch?v=WZnHkv5-z4k

afforded to people and place outside the home and to the escape offered from the realities of the pandemic.

4 Futures of Home Drinking

In many ways, the competing perspectives on home drinking during COVID-19 reflect long-standing tensions in our relationships with alcohol. However, the pandemic has led to new developments that have implications for the future of (home) drinking.

First, although the flow of alcohol has been gradually shifting to the home in recent decades, the pandemic and the resulting lockdown have accelerated this trend, effecting long-term change to rules governing off-license sales and infrastructures for home delivery. As countries move beyond lockdown, the flow of alcohol to public venues may increase; in the Northern hemisphere, the summer months have ushered in a socially distanced season of patios and beer gardens and relaxed rules allowing the consumption of alcohol in parks and outdoor public spaces. Yet, ongoing concerns about the spread of the virus explicitly highlight the risks posed by crowds of young adults in licensed entertainment venues. In the absence of a vaccine and facing the prospect of a second wave of infections and further lockdowns, the home will remain the key locus of alcohol consumption for the foreseeable future.

Second, the circumstances of the lockdown and the spatial reconfiguration noted above have heightened awareness of domestic drinking. This focus constitutes an important opportunity given the lack of attention to the home, the increase in alcohol consumption linked to COVID-19, and the broader social, economic, and health challenges that emerge out of the pandemic. The challenge, however, is to find ways to bridge competing narratives to talk about and respond to domestic drinking in ways that recognize both the pleasurable aspects of alcohol consumption and the potential and actual harms. This will demand a nuanced approach to diverse drinking experiences, the ways in which these are shaped by relations within and beyond the domestic sphere, and the multiple, sometimes ambiguous, effects that flow from these experiences.

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Part V
Methods and Practice

Chapter 52
Public Geographies in a Post-COVID-19 World

Bronwyn Parry

In many respects, the public domain—the out there, real world of everyday life—has always constituted geography's most vibrant field site. Geographers have long prided themselves on their commitment to research and applied interventions that both shape, and are iteratively informed by, experiences of life "on the ground". The sense that our stage is a place "out there" points, however, to a somewhat uncomfortable dynamic (either historical or contemporary we shall have to wait and see) that there remains a persistent gap or distance between these two constituencies—an academic "us" and a public "them". Over the past two decades, geographers have made concerted attempts to both understand and reflexively address their approach to public engagement. As Fuller (Fuller cited in Fuller and Askins 2010: 655) has noted (drawing on Burawoy 2005), public engagement initially took a fairly traditional form in which geographers sought to reach out through their published outputs "beyond the usual ivory tower audiences", to think tanks and mainstream media outlets in order to influence policy and engender public debate. They did so, primarily, from their positions as academics or "public intellectuals".

More recently, geographers have sought to undertake public engagement "in the wild" acting as catalysers of more organic forms of engagement in which they contribute directly as activists; leading protests against threats such as global warming and mounting significant public battles for social change, such as London's Living Wage Campaign (Patel and Smith 2020). The extraordinary and far-reaching public health crisis induced by the COVID-19 pandemic has created many important entry points for geographical research and intervention, but also some necessary processes of self-reflection and review, both for individual geographers and the discipline as a whole. Discomforting as this process may be, it looks set to be redemptive

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for the intellectual project of furthering geographical understandings of the world and highly productive in generating new, and considerably more, egalitarian, inclusive, and de-centred public geographies.

Geographers worldwide have mobilized with remarkable speed to feed their expertise into formal and informal ventures to map the spread of the pandemic and to chart the contours of its social and political impacts. Spatial modelling tools such as the live coronavirus tracking application developed by geographer Bo Zhao at Washington University updates every few hours with data from the Centers for Disease Control and Prevention, the World Health Organization (WHO), and government agencies in China, Hong Kong, Macau, and Taiwan (HGIS 2020).The app provides reliable publicly available data on the pandemic's spread but has also been used by scholars and diverse publics alike to highlight underlying differentials in exposure and mortality bought about by prolonged austerity, oppressive political regimes, the progressive privatization of healthcare, and neoliberal restructurings of the global economy.

Two recent special issues of leading geographical journals (Dialogues in Human Geography 2020) have reported the endeavours made by the geographic community to produce publicly engaged and socially relevant scholarship on the most vexatious of these inequalities, from the strategies deployed by marginalized workers to avoid viral contamination and retain employment in the face of furlough and unemployment (Reuschke and Felstead 2020) to the ways in which lockdown has re-embedded unequal and gendered domestic and parenting arrangements (Manzo and Minello 2020) to its impacts on asylum-led migration to name but a few (Jauhiainen 2020). They also point to the emergence of unprecedented levels of awareness of the profound upheavals in, and re-ordering of, social and political life bought about by the COVID-19 pandemic. The wholly uneven and unequal nature of pandemic life has not only been documented and researched by geographers, but also lived in their everyday/s. Only the most tone deaf amongst them would have been inured to the extraordinary distinctions that have become apparent between their own lives and those of their neighbourhood's most marginalized constituents. For the majority of geographers (for we are, largely, an unrepresentative segment of the population), this has also meant acknowledging, perhaps for the first time, the insularity bought about by white privilege that was both highlighted and amplified, in the midst of the pandemic crisis, by the grievous death of George Floyd.

The global protests that erupted in the wake of this event are undoubtedly amplified by growing empirical evidence confirming a now incontrovertible fact: that socio-economic disparities and racial discrimination were determining the likelihood of living or dying from COVID-19. Mounting frustrations resulted in dramatic increases in public protest both in those countries in the Global South where pandemic-driven economic downturns are most likely to exacerbate existing inequalities (Nigeria, Iran, Algeria, and Ethiopia) but also in the USA, where discontent over the Trump administration's failure to tackle systemic marginalization further inflamed social tensions. Civil protests there consequently rose 168% in just 1 month between April and May 2020 (Blanco et al. 2020). This suggests that public

support for democratic protest or even civil unrest is unlikely to diminish in coming years, even in the face of political repression by the world's most illiberal regimes.

Where activist groups might once have looked to university experts to lend credence and authority to their political struggles, they are now more inclined to draw instead on the strengths of intersectional collaborations and mutual aid networks to address long-standing injustices based on class, gender, or sexuality, many of which have been further aggravated by lockdown. As the Black Lives Matter (BLM) activist and blogger Adam Quarshie has noted, the concept of "mutual aid" has its genesis in the work of the famous nineteenth century Russian geographer Pyotr Kropotkin (2020). Developed as a corrective to the Social Darwinist thesis that survival was secured solely by outcompeting rivals, Kropotkin argued that cooperation was an equally important strategy. Pointing to the highly cooperative social life of ants and communal hunting practices of certain birds and mammals, he concluded that "mutual aid is as much a law of animal life as mutual struggle" (2012: 5).

Those living at the margins of society often receive little state-sponsored assistance in times of crisis. Disavowal of their experiences and suffering has led many such groups to adapt their struggle for survival by becoming, in effect, their own protectors. Just as many impoverished African Americans began to form solidarity networks to distribute food, resources, and aid to their communities following the devastation of Hurricane Katrina in 2005, those most adversely affected by the COVID-19 pandemic are similarly forming new communal collectives to tackle the gravest consequences of the virus at a local level. In Mexico, 63% of women over the age of 15 report having experienced violence during their lifetime. Perhaps, unsurprisingly, lockdown has there dramatically increased rates of domestic violence. The need to socially distance has prevented many affected women from accessing public space and their usual social networks. As Maria Alfaro's research reveals (2020: 4), feminist collectives such as the hacktivist group Luchadoras have thus moved their social organizing online to create digital support networks instead. These, as she notes, are organized, not by governmental bodies, non-governmental organizations (NGOs), or academics, but rather by small feminist collectives who come together through social media to provide practical support for victims and hold the state accountable for its disavowal of the problem. The emotional bonds victims and supporters once experienced are again "re-created by sharing life stories, testimonies of violence, and feelings about quarantine, building community in the shape of a new collective digital memory" (Ibid).

This increasing move towards self-organization in advocacy raises an important question: what role is then left for the academic geographer who seeks to make their work relevant to a wider public? There undoubtedly remains an important call for disciplinary expertise, which can prove vital in holding the line on accuracy and accountability. As the WHO itself notes the COVID-19 pandemic has been "accompanied by a massive 'infodemic'—an overabundance of information—some accurate and some not", which, as Mooney and Juhasz note, "makes it very difficult for people to access trustworthy data sources and reliable information" (2020: 1). Whilst, as Crampton and Krygier (2005) note, the shift from traditional cartography to a decentralized Internet means that the use of maps and associated information is

effectively democratized, "people's trust and tendency to naively accept them as truth can become dangerous in an era of fake news" (Monmonier 2018 cited in Mooney and Juhász 2020: 2) In a post-truth world, geographers can yet provide invaluable insights into what is, and is not, a fact, and by working collaboratively with data visualization experts, government officials, journalists, advocates, and the wider geospatial community, create public geographies of mapping and data surveillance that are legitimate and fit for use in public life.

These kinds of sustained socially engaged collaborations hint at the ambitions for styles of engagement first envisaged by those who developed the concept of public geographies in 2008. One aspiration was "to explore practical ways of enhancing a multi-faceted, effective and mutually beneficial programme of engagement, dialogue, mutual education, and dissemination of geographical knowledge", whilst simultaneously reflecting "on the extent to which anyone might actually want to listen to what academics/geographers have to say, or interact with what they do" (Fuller and Askins 2010: 656). This last point has become 'perhaps' the most acutely compelling, if not also uncomfortable, in the current crisis. COVID-19 has bought into sharp relief the positions of privilege from which many academics operate. Yawning divides have been exposed between those with advanced qualifications, quality housing, relative wealth, and comfortable surrounds, and those who scrabble to lift themselves from poverty and organize themselves socially and politically to address the sometimes doubly oppressive remediations that have been authorized under various "states of emergency". The strengths of the collective responses that have emerged from within the precariat might suggest that opportunities or invitations for elites to join the cause may be now limited if not non-existent. This will almost certainly be the view of those who believe universities to be sites of coloniality and oppressive knowledge production.

Despite these sentiments, COVID-19 presents, I suggest, a perhaps once in a generation opportunity, to radically remake our academic engagements with those most adversely affected by the pandemic, to move up and beyond the two historic positions outlined at the start of this paper. Rather than "shifting about between the stereotype ivory-tower knowledge producer … and the academic as public intellectual and activist" (Fuller and Askins 2010: 655), the university community (academics, students, and activists alike) needs to learn how to work with those most adversely affected by COVID-19, but I would argue, in an entirely new register, one based on the principles of solidarity, not charity. This obliges us to deploy the considerable resources and expertise afforded by the university to actively support, but not direct, the collective work of addressing the discriminatory practices that have led to the dispossession and marginalization of those worst affected by COVID-19.

In coming to voluntarily occupy a more subordinate mode of engagement, we might collectively begin to listen—not to simply ready a reply, but to learn. The ability to more fully understand and act on the concerns of the marginalized might also be enhanced by the university's own experience of the pandemic. As the geographer Michael Watts has argued, the "centrifugal forces" that conventionally propel highly trained graduates out from the academy have accelerated, leading many to exit earlier than planned into an unstable economy that offers few job prospects,

a development that may force many young academics themselves into the precariat. Uncomfortable as this may be, it might also provide opportunities to effectively decolonize activism and generate new and much more egalitarian forms of public engagement. As he goes on to note, many social advocacy organizations lack the capacity to analyze and monitor the data they collect, and they would undoubtedly benefit tremendously "from the input of young, smart, tech-savvy students" (Watts 2020: 2). This presents an occasion to turn "what may become a large cohort of non-enrolled college students into a powerful social force for good, and for personal betterment, growth, and education … and an opportunity to road-test what some have suggested is the future of higher education: spending time on and off campus, in and outside of "the workforce" (Ibid).

The UK's Build Back Better coalition for post-corona reconstruction provides a potent example of how this more socially imbricated form of public engagement might work. Bringing together a wide range of social advocates from the Quakers to Nurses United, the UK Student Climate Network, and Bath University's Centre for Development Studies (to name but a few), the coalition works collaboratively to both expose and address the structural weaknesses and deep-seated inequalities that have amplified COVID-19 exposure risks for the nation's most vulnerable populations. Conjoined in a flattened hierarchy, they move forward together, working, in service to society. By deliberately and consciously reducing the social distance between academics and advocates, it becomes possible to create a unified and powerful movement for social reform, overcoming in the process many of the impediments that have militated against the effectiveness of much public geography to date. In emulating this model, we have, as they suggest, an opportunity, post-pandemic and as the world recovers "to reset the clock and build back better than before" through new and more genuinely egalitarian forms of public engagement (Build Back Better UK 2020).

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Chapter 53
Textures of an Epidemic: On the Necessity of Qualitative Methods in Making Better Pandemic Futures

Susan Craddock

1   Introduction

Numbers predominate in an infectious disease outbreak: the number of total cases, the number of new cases, the number of dead, and the numbers across municipalities, regions, and nations. COVID-19 is no exception to this. Every new day brings new numbers for us to digest about the upward or downward trajectories of new cases, or the number of young versus elderly people succumbing to a disease that remains both confounding and frightening in its unfolding complications. There are reasons why we need these numbers despite the deep ambivalence most of us have for what they might tell us and why we continue to consume them. They provide us with very basic roadmaps of what we can and cannot do in our everyday lives during a pandemic, and which decisions we need to make now and in the near future.

Yet, as a geographer who has employed qualitative approaches my whole career to better understand infectious disease outbreaks and their aftermaths, I am continuously surprised not at the fact that quantitative measures of an epidemic are important, but at the extent to which they overshadow qualitative assessments. Numbers should be a starting place to begin asking those critical questions that help us understand what is happening on the ground to those people infected, their loved ones, their caregivers; to those larger numbers impacted by government interventions; and to the deliberations that go into decisions about public health policies, including what might have worked in previous epidemics. Knowing details of differential impacts, discovering that suffering and vulnerability have endless permutations, and understanding the varied ways people perceive and respond to epidemics is just as important as the stories that numbers tell. In fact, knowing what I call "the textures of an epidemic" is vital to understanding not just who might be impacted more

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heavily, but why and how. COVID-19 is no exception to why we need to elucidate experiences across locations through conversations, interviews, and ethnographies; and comb archives for what lessons might be revealed, because doing this could mean doing better than we have in this epidemic to be prepared, redress long-standing inequities, prevent more deaths, and enable better futures. In what follows, I will elaborate on some of the roles qualitative methods play in elucidating the many complexities of pandemic experience.

2   The Richness of Archives

Some might question the usefulness of archives in helping us understand epidemics of today. After all, science has changed so dramatically in recent years in its ability to "fingerprint" pathogens, trace and track their pathways, discern mutations, and—as we are seeing during COVID-19—accelerate vaccine development. Disregarding history, however, comes at a cost of repeating mistakes that are less dependent on the latest in scientific innovation. As Alice Dautry, former Director General of the Pasteur Institute, commented during the H1N1 pandemic:

> Past pandemics, particularly evaluated comparatively, can provide us with information on a range of ways that a future one might unfold, and it therefore remains important to reflect critically upon past pandemics as well as the present one, so as to prepare ourselves in the broadest possible ways for future epidemic events… It is important, I think, that we examine the political and economic dilemmas and the decisions that guided attempts to manage [past] epidemics, and to investigate both the ethical implications of these decisions and the social responses to them. Such efforts will help us to revise current efforts underway, but also to prepare for the future (2009: xv).

Dautry's point about examining political and economic dilemmas of managing epidemics and their ethical implications is apt. One of the most significant debates countries are facing during COVID-19, for example, is whether, to what extent, and for what duration lockdowns should be enforced. Social responses to these policies have ranged from the very human (i.e., a need however misguided during an epidemic to seek human company) to the political (i.e., the protests in the USA that the virus is a hoax, and requiring masks is a government overstep into arenas of personal freedom). Economic fallout from extended quarantines has been widespread across geographies and includes massive job losses as well as heightened levels of food insecurity for many. For many governments, reactions to these responses and repercussions have been a defensive scrambling to find better ways to enforce policies, or resources to stave off hunger and other devastating results of heightened economic precarity.

The point here is that none of this should be surprising. For centuries, quarantine has been the most common tool for isolating the infected and deterring the spread of disease outbreaks; and for decades, medical historians have been describing in detail the social, epidemiological, and political discussions undergirding decisions to enforce quarantine, and the many responses people have had to these across time

periods and regions—including responses strongly resembling what we are facing today. People have always pushed against the punitive restrictions of quarantine, finding ways to mitigate its economic burdens or bristling at its constriction of individual autonomy (Calvi 1989; Leavitt 1997).[1] Economic devastation as a result of quarantines and other facets of outbreaks have been described for pandemics from the Black Plague to the influenza pandemic of 1918 and beyond (Robbins 1928; Garett 2008).

Though there is rarely a direct transfer of knowledge from historical pandemics to today's, the lessons to be learned from historical precedent are nevertheless trenchant. They can direct us away from interventions that did not work under similar circumstances and pathogens, or toward those measures facilitating adherence to difficult public health policies. They tell us what is likely to happen within particular policy scenarios, eliminating "unpredictable outcomes," and point to the necessity of recognizing the highly variable impacts of policies on different populations. They also highlight an enduring facet of pandemics: the distrust of medical and public health constabularies by marginalized constituencies. Our collective inattention to the reasons for distrust means continuing to fail precisely those communities most in need of adequate and appropriate protection.

Archives, of course, have their limits. Sometimes what happened centuries ago does not aid in our understanding of our current selves and the situation with which we are struggling to contend. Science has changed drastically, but not just in making significant leaps in our understanding of viruses and their behaviors relative to, for example, the 1918 influenza pandemic. Included as well is the science behind our social media platforms and the roles—beneficial and highly destructive—they play in circulating (mis)information; or behind the computer programs either enabling rapid patient data transfer from clinics to hospitals, or preventing many laboratories from working with clinics and hospitals urgently needing test results for their suffering patients. Archives can point out that inequalities have persisted through the centuries, but they cannot tell us exactly what inequality looks like today. For these issues, other qualitative methods are needed, as I describe in brief below.

3 Assessing the Social Fabric of Epidemics

Numbers might point out inequities in epidemic impact, but they say nothing about why and what that means to the people facing heavier burdens of illness and loss. They also say nothing about the many layers of what constitutes a pandemic. So, much of what a pandemic *does*—what repercussions it galvanizes, how it gains meaning, shifts everyday practices, highlights ugly social underbellies—happens

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[1] The examples for each of these facets of pandemic are too numerous to cite, so those I do cite represent various pandemics, time periods, and geographic regions, as well as signaling how long historians have been writing about difficult policy decisions made during disease outbreaks and the ethical dilemmas surrounding them.

on the ground in homes, communities, laboratories, and boardrooms. A few examples of these myriad epidemic complexities will hopefully evidence why qualitative methods including interviews, engaged scholarship, and discourse analysis are so important.

Medical social scientists have long discussed in detail how pandemics aggrandize social inequities, yet this scholarship is largely considered irrelevant to public health and medical practitioners. The result is that many countries neglect to recognize, or in the case of SARS-CoV-2 in the USA only "discover" for the first time, that poor and marginalized communities die at far higher rates from viruses that in narrative discourses impact everyone equally. Even those countries statistically confirming inequities too often fail to uncover the complex and interwoven reasons driving greater vulnerability and mortality, or to recognize the more burdensome short- and long-term futures of precarious communities from syndemic (Singer 2009) ripple effects. It is through ethnographies, interviews, or community-based participatory research that conversations with those in underserved communities uncover what it means to experience job layoffs, loss or lack of health insurance, food insecurity, and chronic health conditions exacerbated from inattention during epidemics that overburden even wealthy countries' healthcare systems. Indigenous communities globally are, especially, likely to fall under the radar and to be particularly hard-hit by outbreaks; the Navajo Nation, not New York city, at one point had the highest per capita rates of COVID-19 in the USA for example. For countries like the USA, too, long-standing political and epidemiological blinders have meant only now taking seriously those few medical studies evidencing the deleterious somatic outcomes of everyday racisms and the very particular ways that pandemics exacerbate these. Listening to the experiences and collective knowledge of marginalized communities, engaging the scholarship and activism of those with personal experience of and insights into the needs, deficits, desires, and ongoing initiatives particular to each community, are critical to preventing more "rediscoveries" of highly inequitable epidemic outcomes, to informing those responsible for providing public health guidelines that these need to be viable and effective not just for the middle classes, but also for those most at risk of infection, and to providing the groundwork for much better futures for all, not just some.

On the technological front, vaccines become the hope of every pandemic, the panacea making happen what public health measures cannot. Much less attention is paid, however, to the processes and politics of vaccine development examined. Here, too, social scientists have paved the way with scholarship resulting from qualitative methods such as multi-cited ethnography including scientific conferences as field sites. More than 10 years ago, for example, on the tails of the 2009 H1N1 pandemic, my colleague Tamara Giles-Vernick and I, among others, wrote about the inequalities characterizing the vaccine developed and deployed for that outbreak (Giles-Vernick and Craddock 2010; Schlein 2010; Enserink 2009). Namely, early in the process contracts between rich countries and vaccine-producing pharmaceutical companies are made specifying the number of vaccines each country is likely to need. Those countries without the capital for these advance contracts are typically left to make do with donations by countries, organizations, or pharmaceutical

companies. But this system of relying upon leftovers is grossly inadequate even in a milder outbreak. In 2010, the WHO indicated only around 180 million vaccine doses were available for distribution very late in the epidemic, and these would go to 17 out of 95 countries in need—enough for around 10% of those countries' populations (ibid). What we did not do then but what needs to happen is more qualitative scholarship making visible what that means for those left without. What do governments, urban dwellers, and rural communities do, absent a vaccine to protect them?

Under COVID-19, little has changed. There are still no mechanisms assuring more equitable global distribution of a vaccine when and if it becomes available, ensuring that once again wealthy countries might be covered, but those living in poorer countries will not. Indeed, given the mortality rates and severe complications of COVID-19, it is likely that more people will want the vaccine, leaving far fewer doses available for donation. Within the USA, access will likely be constrained because of pricing. Despite heavily subsidizing some candidate vaccines, the government has yet to suggest it will veer away from standard refusals to cap pharmaceutical company pricing of new technologies, leaving in question how many Americans will be able to afford a vaccine potentially costing hundreds of dollars (Rosenthal 2020).

All of these issues—what are, but shouldn't be, side stories to always already storied pandemics—need even more exploration, nuance, and visibility than social scientists have managed. And the only way to get that is through the qualitative methods outlined here. We need social scientists interviewing pharmaceutical representatives (though they make that exceedingly difficult), public health and policy officials across the globe, scientists working on vaccines, and the many constituencies in various countries who once again will be left out with no effective preventive for an infectious disease outbreak. We need through this scholarship to recognize that effective preventions lie in redressing social and economic deficits. We need more effective ways of holding accountable those responsible for high prices and limited distribution of needed vaccines and effective drugs; we need to know more about what creative community alternatives are spawned through government negligence, or how we can coax more scientists into being political allies focused as much on distributing lifesaving technologies as on producing them.

4 Conclusion

Pandemics by default wreak death and destruction, but the breadth and depth of that damage can be controlled by appropriate public health interventions and thoughtful plans for epidemic aftermaths. Yet, not enough of that has happened with COVID-19. Indeed, much has gone wrong with this pandemic. Many countries and states, assuming rigid binaries between quarantine measures and healthier economies, reopened too soon and brought fresh, and for some areas unprecedented, surges of COVID cases. Many countries have imposed lockdowns with no accompanying plans for the widespread fallout inevitably resulting from millions suddenly jobless.

Some of the most unequal countries such as Brazil, India, and the USA were the worst in resigning—sometimes seemingly willfully—from accountability toward their least resilient and, therefore, most compromised communities. Even wealthier countries found themselves lacking critically needed medical infrastructure, and lower-income countries had even less to work with. I could go on, but the points of this are twofold. First, the needless numbers. The numbers of dead, malnourished, and further immiserated that could have been prevented with better planning and foresight is inexcusable. Second, the reason it is inexcusable is because though more always needs to be done, still little of this is new. The details change, but the general coordinates of failure have been exquisitely outlined, excavated, examined, and made visible to us through multiple qualitative accounts; and we are continuing to make critically important social, institutional, political, and individual facets of pandemic visible through qualitative assessments. If we are to "revise current efforts underway," as Alice Dautry recommended (2009: 2) we need to create through our scholarship a sense of outrage in addition to our accumulating knowledge base, an outrage aimed at what we increasingly know needs to be, but hasn't yet been, done to make better pandemic futures.

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Chapter 54
Counting COVID: Quantitative Geographical Approaches to COVID-19

Sara L. McLafferty, Aida Guhlincozzi, and Fikriyah Winata

1 COVID-19 Data and Modeling

The COVID-19 pandemic demands innovative methods of quantitative analysis (QM) to understand where and how the disease spreads, to estimate and predict its impacts on population health and wellbeing, and to plan effective public health responses. We briefly review quantitative data and approaches to investigating geographical dimensions of COVID-19. These approaches will often involve: developing multi-scalar and dynamic models that incorporate geographic processes and variability; harnessing big and real-time data on people's mobilities and interactions; and paying attention to how gender, ethnicity and other dimensions of people's identities intersect with larger structures in impacting the uneven geographies of COVID-19 risk. Our chapter addresses each of these topics, after a brief discussion of quantitative geographic data on COVID-19.

Quantitative data consist of counts or measurements of COVID-19-related disease incidence, behaviors, and contexts. From the start of the pandemic, maps and charts of COVID-19 incidence and spread have been central to our understandings of the disease and its widespread impacts (Fig. 54.1). Yet the quantitative data underlying these maps and charts are often poorly defined. Like all geographic health data, data on COVID-19 cases and deaths are outcomes of diverse reporting systems that affect what gets counted and why. Case definitions differ from place to place and change over time. Early in the pandemic, China only reported symptomatic cases; later, the country's case definition changed to include asymptomatic cases. Reported data are also shaped by the extent and nature of COVID-19 testing. More extensive testing uncovers more positive cases, so places where testing is

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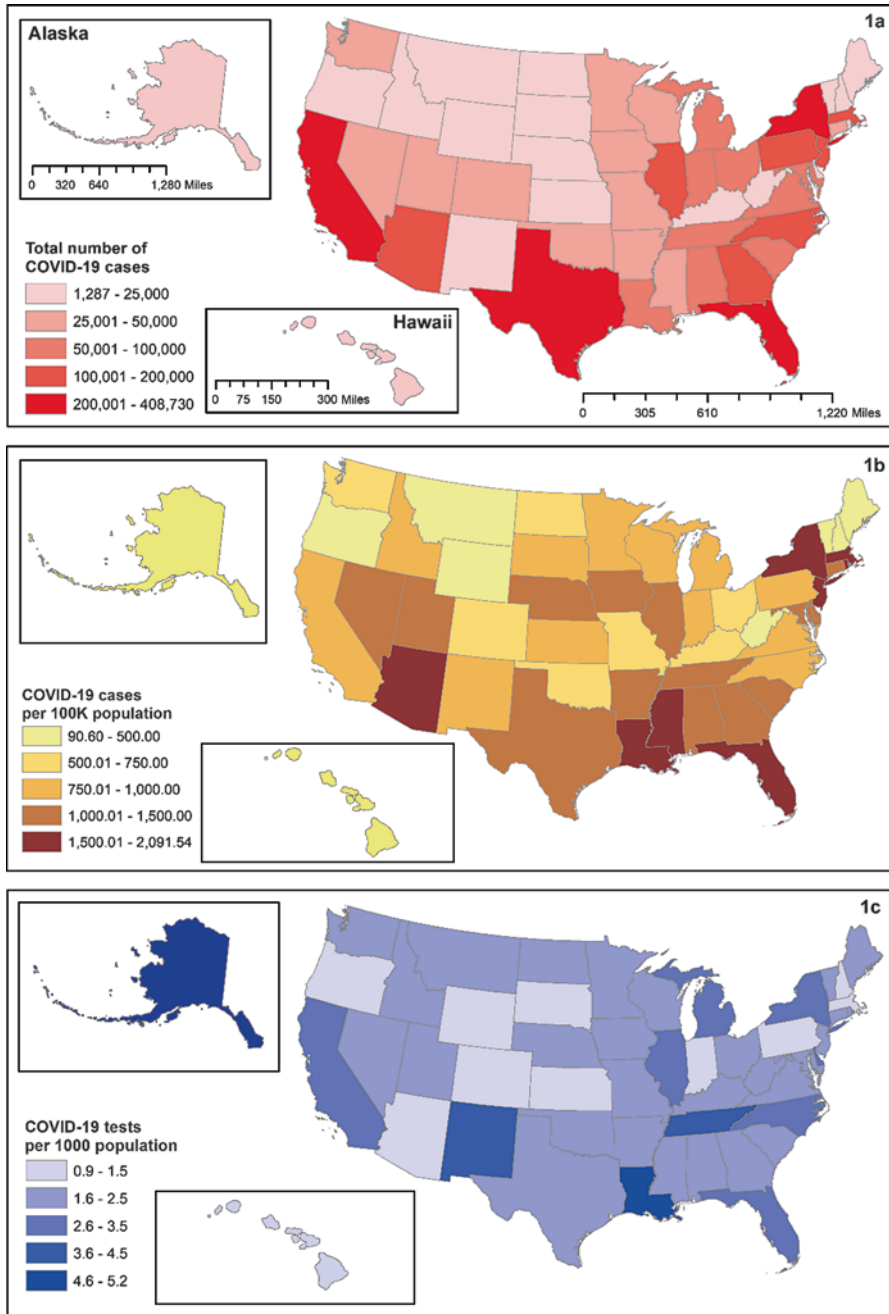e-mail: smclaff@illinois.edu; guhlin2@illinois.edu; fwinata2@illinois.edu

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Fig. 54.1 Maps of COVID-19 by state: (1a) total number of COVID-19 cases, (1b) COVID-19 cases per 100 K population, and (1c) COVID-19 test per 1000 population. COVID-19 case data are for July 21, 2020, from the US Centers for Disease Control and Prevention. COVID-19 test data were obtained from the Johns Hopkins Coronavirus Resources Center for July 24, 2020

limited will show low COVID-19 incidence. Seizing this basic point, some federal officials in the United States (US) wanted to defund COVID-19 testing which would effectively hide the epidemic's scope. Also, in most places, testing occurs when individuals decide to get tested or when healthcare providers request a test. As such, disease reports are structured by social, economic, and political processes that affect individual and provider decision-making. These diverse place-based processes can lead to gaps and biases in disease incidence data that strongly affect quantitative analysis results (McLafferty et al. 2020).

In addition to maps and charts, QM can and are being used in modeling the uneven geographies of COVID-19 and planning public health interventions. Much modeling involves efforts to predict the shape of the COVID-19 curve—the timing and extent of disease spread—using spatial epidemiology approaches (Chap. 1). At a more granular level, we can also model COVID-19 spread using agent-based modeling, an approach that can incorporate differences in individual and group behavior and diverse geographic contexts. Agent-based modeling simulates the behaviors of individual "agents" in hypothetical geographic settings to predict spatial and temporal patterns of disease transmission (Mao 2014).

QM also have an important role in understanding contextual and compositional dimensions of COVID-19 prevalence. Demographic, social, environmental, and political factors at varying spatial scales affect COVID-19 incidence and outcomes (Table 54.1). These place-based factors can be analyzed using multilevel modeling, a method widely employed in health geography to investigate geographic variation in health and well-being (Duncan et al. 1996). Spatial and temporal variables such as proximity to high-prevalence areas and time along the epidemic curve also should be incorporated (Arcaya et al. 2012) because COVID-19 prevalence constantly changes as outbreaks unfold and public health interventions are adopted to contain them. Spatial modeling can also shed light on the many dimensions of COVID-19 testing including the intensity of testing and positivity rates, as illustrated in a recent case study of data for New York City (Cordes and Castro 2020).

Another key area for adoption of QM is in planning and managing the public health response. Methods like location-allocation analysis can assist in identifying locations for COVID-19 testing centers and vaccination and treatment sites to minimize people's travel times and distances to reach them. Other applications include analyzing constraints on hospital capacity to estimate where additional capacity may be needed (Woodul et al. 2019). The enormous scope of the COVID-19 pandemic means that preventative and treatment measures such as immunizations will need to be rolled out on a massive scale to diverse populations in diverse and dispersed settings, and geographic methods will be crucial for accomplishing this equitably and efficiently.

Table 54.1 Multilevel place-based factors related to and affecting COVID-19 incidence, spread, and impacts: a partial list

Individual	Neighborhood
Age	Health services availability and quality
Gender	Population density and crowding
Race/ethnicity	Open/green space
Occupation	Neighbors' adoption of preventive measures
Education	Availability and cost of testing
Healthcare access and coverage	Local regulations of bars, restaurants, etc.
Willingness and ability to adopt preventive measures	Relative location
Immigration status	Social networks and interactions
Household	State/province
Household income	COVID-19-related regulations—mask and social distancing requirements, etc.
Transportation access	Funding for and provision of testing and treatment
Housing quality, size, and crowding	Travel restrictions
Presence of children and older adults	Country
Workplace	COVID-19-related regulations—mask and social distancing requirements, etc.
COVID-related exposures	Funding for and provision of testing and treatment
Protective and preventive measures	Travel and border restrictions
Ability to work from home	Location and isolation
Density and proximity of workers	Economic and resource constraints
	Political commitment (or not) to public health interventions

2 GPS-Based Data and Methods

Human mobilities and interactions escalated the spread of COVID-19, and real-time quantitative geospatial data and methods are increasingly important for understanding and modeling the disease. Such data are generated from GPS-based devices including mobile phones and fixed and portable sensors recording time, date, and locational coordinates. The data can be used to assess people's daily mobilities, social interactions, and behaviors while helping to provide appropriate recommendations to control and respond to COVID-19 spread, whether through lockdown, sheltering in place, or a stay-at-home order. This section outlines the important roles of mobile phone data as a tool for contact tracing and detecting the spread of disease during the COVID-19 pandemic.

Mobile phone data—commonly in the form of mobile applications (apps) that people can easily download—are increasingly used for contact tracing. These data can show who, when, and where a person may have encountered COVID-19 carriers (Oliver et al. 2020). This role is crucial to tracing potential carriers and those exposed to the virus. COVID-19 contact tracing may allow individuals to receive

COVID-19 updates, alerts, and questions through their mobile phones, reducing the need for in-person contact.

Mobile phone contact tracing apps have been used in many countries during the pandemic. South Korea created a daily mobile phone app to alert individuals about places that have been visited by those infected by COVID-19. Singapore deployed the TraceTogether app, NZ COVID Tracer was used in New Zealand, and Australia uses the COVIDsafe app. In China, Taiwan, and Hong Kong, the contact tracing worked effectively to reduce the spread of the disease. Although the use of tracing apps has been debated within many European countries, Germany, Spain, and Latvia use similar technologies. In the United States, the country with the highest number of COVID-19 cases in the world, there are no plans to implement contact tracing apps on a national scale. However, companies like Apple and Google now provide "COVID-19 Exposure Notifications" on iPhone or Android settings, and users can decide whether to turn on the notification alerts.

Aside from contact tracing, real-time quantitative geospatial data can help researchers better understand how, to/from whom, and where COVID-19 spreads. Health geographers and epidemiologists have harnessed real-time mobility data in analyzing health-related environmental exposures and behaviors (Prior et al. 2019), and efforts are underway to apply them in modeling COVID-19. Yong et al. (2020) used data from contact tracing apps to create activity maps to determine possible exposures and examine potential epidemiological links between cases and clusters. Similar data formed the basis for Ferretti et al.'s (2020) mathematical model of the exponential phase of COVID-19 spread and the impact of public health interventions. These "big data" analyses typically require large-scale computing resources and innovative spatiotemporal and statistical approaches to identify meaningful trends and associations.

3   Critical Perspectives on Quantitative Approaches

Although quantitative geospatial data and methods have a key role in understanding and responding to COVID-19, their use needs to be framed within a critical lens. Unevenness in data collection and reporting relates not only to lack of resources and testing but also to racial, ethnic, and linguistic biases that vary geographically. In the United States, for example, the rapid spread of COVID-19 in American Indian reservations has been linked to inadequate public health infrastructure and the failure to tailor public health messages to local languages and cultural norms (Rodriguez-Lonebear et al. 2020). These processes led to underreporting and inadequate interventions that in turn fueled COVID-19 spread. Thus, axes of difference, such as race, gender, and class, become embedded in quantitative geospatial data during the data creation process (Leszczynski and Elwood 2015) and, in turn, constrain the public health response. If these biases are ignored, then crucial policy recommendations may not be identified and put forth. To avoid recreating structural harm through

quantitative geospatial data and analysis, researchers may consider the three P's: perspective, purpose, and privacy.

Perspective questions the view that data are ownerless and without bias ("the view from nowhere"). It emphasizes that data are created via socially and politically designed platforms and systems that result in gaps and biases (Elwood and Leszczynski 2018). For COVID-19, these biases can stem from differences in reporting and testing among population groups and places. Testing and reporting vary widely across localities, states/provinces, and countries reflecting resource constraints and sociopolitical influences. At the same time, factors like access to healthcare, cost of testing, and knowledge of and mistrust in healthcare systems strongly affect people's willingness and ability to get tested. This can result in lack of testing among low-income and vulnerable populations that becomes embedded in quantitative testing data which in turn diminishes the extent of disease in these communities. To address these concerns, researchers need to think critically about data collection and reporting methods and the resulting biases and silences.

Purpose asks about what interests the data, analyses, and results serve. Geospatial applications and services can target certain groups over others (Leszczynski and Elwood 2015). In the United States, the high costs of COVID-19 testing (in some cases $150 per test), which serve the interests of biomedical companies, constrain people's ability to get tested and in turn affect quantitative data about the pandemic. Maps can also serve varying purposes. Hotspot maps of COVID-19 can stigmatize particular places and populations despite the maps' utility for planning and intervention. Because the pandemic has disproportionately impacted racial and ethnic minorities and other vulnerable populations, hotspot maps can promote 'othering' responses that involve blaming those groups for COVID-19 spread. Understanding the purposes underpinning quantitative data and results and their uneven implications for population groups and places is crucial for more accurate analyses and policy recommendations.

Privacy, the last P, speaks to purpose and perspective as well. How data is created, analyzed, and displayed can impact the level of privacy of the groups being studied. With respect to COVID-19, the contact tracing apps discussed in the previous section raise critical concerns about the privacy and confidentiality of individuals' locational information. Where people were, when, and with whom are all revealed via these apps. Although these data are crucial for intervening to limit COVID-19 spread, the individuals tracked may have little control over how their own data are collected and stored and who has access to it. Geographers have developed methods and approaches for protecting privacy of geospatial data that can inform collection and dissemination of GPS data in the context of COVID-19.

4   Conclusion

Quantitative geospatial data and methods are useful and important in understanding and responding to COVID-19. Their applicability extends from mapping indicators of COVID-19 incidence, outcomes, spread, and impacts to more complex modeling efforts that assess underlying place- and population-based disease influences and that guide predictive modeling efforts and public health interventions. There are also significant opportunities to harness novel GPS-based big data to chart the pandemic's many influences on mobility and social interactions and to facilitate activities such as contact tracing that are crucial in slowing the pandemic's rapid spread. We argue that these efforts not only require larger datasets and more complex spatiotemporal models but also methods that are sensitive to people and place. The uneven impacts of COVID-19 among population groups and the varying trajectories of spread among places call for context-dependent approaches and approaches tailored to the distinct/unequal experiences and exposures of specific population groups.

We also emphasize the need for quantitative researchers to think critically about data and methods in investigating COVID-19. Quantitative data are not neutral. They reflect the platforms and processes through which they are generated, all of which differ from place to place. For COVID-19, platforms are rooted in the place-based economic and political relations that govern case definitions and funding, procedures, and regulations for reporting and testing systems. Moreover, COVID-19 data are impacted by individual and provider decisions about diagnosis and treatment and thus are filtered through healthcare systems. Along with these data issues, quantitative researchers need to think carefully about how the results of their research will be interpreted, shared, and understood and whose lives and livelihoods will be affected via privacy and purpose concerns. Critical and place-based quantitative approaches will be central to ongoing efforts to curb COVID-19 and mitigate its widespread and unequal impacts.

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Chapter 55
GIS and Spatial Representations: Challenges and Missteps

Joseph Oppong and Chetan Tiwari

1 The Challenge of COVID-19

The global devastation of COVID-19 has been quite uneven between and within countries. Even within countries, local level variations of morbidity and mortality vary in ways that are not fully understood. However, the explosive spread has overwhelmed even the most resilient health systems leading to widespread implementation of physical distancing measures and population movement restrictions. Struggling to minimize the economic devastation associated with COVID-19, many countries were wrestling with difficult decisions—to reopen or not. Countries that had reopened earlier were reimposing more stringent lockdown measures to contain a new wave of spread. In this whirlwind of uncertainty and anxiety, when demand for credible information for pandemic decision-making is at an apogee, never has the result of traditional geographic tools such as disease mapping and hot spot analysis been as confusing.

GIS and spatial analysis are invaluable for tracking the spatial and temporal patterns of disease spread and work best for chronic diseases that do not change rapidly over space and time. These tools are being adapted for tracking the spatial and temporal patterns of COVID-19 spread and developing appropriate responses for mitigation by identifying transmission dynamics (Xiong et al. 2020; Giuliani et al. 2020). They also provide an important visual representation tool for communicating disease impact and planning and targeting interventions (Franch-Pardo et al. 2020). Yet, for COVID-19, messy and inconsistent health data remain a huge problem.

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2   GIS and COVID-19

Due to an incomplete understanding of the disease, inadequate access to testing, and ad hoc data collection and management systems, producing reliable geographic representations of the COVID-19 burdens is extremely difficult. Moreover, political pressure to produce information for rapidly changing scenarios has led to a plethora of mediocre maps of COVID-19 that distort reality and may be inadvertently misleading (Rosenkrantz et al. 2020). For example, the COVID-19 dashboard managed by the Texas State Department of Health Services (DSHS) uses a county-level, graduated symbol map of cumulative case counts to describe the geographic dimensions of the disease in Texas (Fig. 55.1). This map is an inadequate spatial representation of the disease for two main reasons. Mapping case data instead of a rate is not very meaningful as the map simply replicates population patterns. While this interactive, Web-based map provides easy access to visual information via a clickable interface, using graduated symbols with areal (i.e., county-level) data states the obvious—large cities have large numbers—and provides little new insight. Careful consideration of the design elements of the symbols and map is necessary (Cybulski 2020; Brewer and Campbell 1998). Until very recently, this was the visualization approach of the popular Johns Hopkins COVID-19 dashboard (John Hopkins 2020).

The choropleth maps in Fig. 55.2 present traditional strategies for mapping disease data. However, the usefulness of these approaches for assessing COVID-19 burdens is limited due to unique challenges presented by the disease as well as
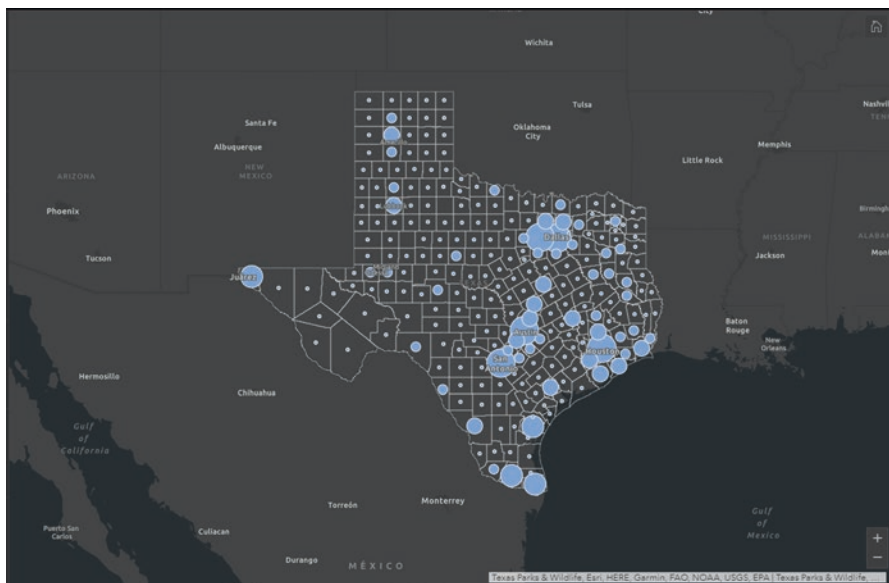

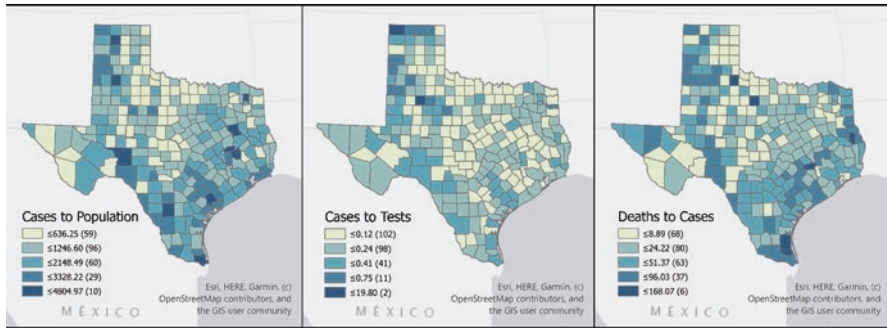**Fig. 55.1** Screen capture of COVID-19 dashboard maintained by the Texas Department of State Health Services

Fig. 55.2 Choropleth maps comparing spatial patterns of COVID-19 burdens produced using three different ratios: (**a**) cases to population, (**b**) cases to tests, and (**c**) deaths to cases

inadequate data infrastructure needed to support the collection and management of COVID-19 data.

Substantial underreporting of infected patients is inevitable using the current symptom-based surveillance and screening. Because asymptomatic transmission plays a key role in community spread, population-based surveillance and isolation of asymptomatic patients may be required. Yet limited access to testing precludes this (Lee et al. 2020). Inconsistencies in who gets tested make data comparisons a big headache as some jurisdictions offer tests to anyone who wants one while others only test those with symptoms or are categorized as high risk. In fact, COVID case numbers are the result of several subjective choices that are rarely documented or transparent.

How data is gathered—and whether it is gathered the same way each time—matters. The first map (Fig. 55.2a) shows the prevalence rate of COVID-19 in Texas counties. This map was produced by dividing the total number of positive cases by the 2018 population estimates obtained from the US Census Bureau American Community Survey (ACS). This map presents another example of inappropriate visual representation of COVID-19 data due to discrepancies in the numerator and denominator populations included in the calculation of this rate. For example, because of well-known limitations in COVID-19 surveillance, particularly spread via asymptomatic carriers and problems with testing, the case data (i.e., numerator) are only a subset of the true number of cases in the population. Consequently, this map likely underestimates the true prevalence of COVID-19 among Texas counties.

The second map (Fig. 55.2b) presents the test-positivity rate, a commonly used measure for assessing COVID-19 severity. It is calculated by dividing confirmed cases by total tests. Ideally, the populations included in the numerator (i.e., confirmed cases) are a direct subset of those included in the denominator (i.e., tests), but this is rarely the case. In the United States, as in many other countries, testing is plagued with problems, such as test reliability (Arevalo-Rodriguez et al. 2020) as well as availability. Where Americans live and their income and race/ethnicity determine the ease of access to a COVID-19 test (Vann et al. 2020), requirements for getting a test have changed with time as the outbreak has evolved. Initially, those

seeking tests required doctor referrals, appointments, and symptoms consistent with infection. Many employers require employees to record two consecutive negative tests before they are allowed back to work. Such protocols when combined with testing delays, where test results take anywhere between 2 days and 2 weeks (Foley 2020), create significant inconsistencies between the populations included in the numerator and denominator used in the calculation of this rate. Although a 7-day moving average is commonly used to address the problem of double counting, limited data infrastructure for recording individual-level test outcomes continues to distort this measure of assessing COVID-19 severity.

The last map (Fig. 55.2c) presents a third measure of COVID-19 severity. This map is produced by dividing deaths by cases. This measure is also problematic due to the lack of protocols for testing and coding of mortality-related events, which is likely leading to substantial undercounts of events (Kliff and Bosman 2020).

In addition to limitations imposed by the disease and how data are collected, statistical considerations that address the changing sample sizes and levels of reliability over time must be incorporated in spatiotemporal assessments of COVID-19. Other statistical adjustments that are commonly applied to disease maps to address limitations of small numbers and differential levels of risk among age groups need to be considered in order to determine accurate estimates of the COVID-19 disease burdens (Beyer et al. 2012).

3   Conclusion

Despite imperfect data, GIS analysis can provide critically important insights for the fight against COVID-19. However, careful, critical use of tools and nuanced interpretations and conclusions are vital. Disease maps can provide a relative assessment of COVID-19 burdens across geographic space. When used with caution, they can provide valuable insights for designing and implementing and even evaluating place-based public health interventions. In fact, the limitations posed by the rapidly changing nature of COVID-19 along with the lack of appropriate data infrastructure for capturing information for such diseases present numerous opportunities for future research. We envision the development of a spatially explicit surveillance system for infectious diseases that enables universal and consistent collection of data across federal, state, and local entities. The use of electronic health records, for instance, can enable name-based surveillance to prevent problems of duplicate data collection. GIS-enabled dashboards that integrate methods for creating statistically accurate representations of disease burdens (Tiwari and Rushton 2010) along with tools to assess vulnerabilities and guide the placement of resources (O'Neill et al. 2014) must be developed.

Developing surveillance systems for disease outbreaks such as COVID-19 requires coordination between federal and state entities to ensure consistency in the protocols for data collection, recording, and reporting. Primary considerations for the development of such systems start with the identification of key data

elements—including spatial and temporal resolution, uniform and well-defined schemas for recording and reporting data, guidelines to ensure data integrity and quality, and the computational infrastructure to support such operations. While some infrastructure for collection of disease data already exists in the United States, e.g., SEER program for recording cancer outcomes, the rapid spatiotemporal dynamics of diseases such as COVID pose many complex challenges. In particular, the rapid spread of the COVID-19 due to the movement of people within a highly globalized world requires that active surveillance efforts must incorporate detailed information on human mobility. Mechanisms to enable rapid public health interventions through efforts like contact tracing must be incorporated within such system. While the collection of high-resolution data can significantly enhance public health efforts, these systems must ensure adequate protection of such data, which come with significant privacy and confidentiality implications.

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Chapter 56
New Forms of Data and New Forms of Opportunities to Monitor and Tackle a Pandemic

Mark Green, Frances Darlington Pollock, and Francisco Rowe

1 Introduction

The need for real-time, frequent, and internationally spanning information is crucial when dealing with dynamic and fast evolving pandemics such as COVID-19. Governmental organisations need to understand, adapt, forecast, and target based on timely information. Administrative data systems play important roles but can be limited through slow data releases, insufficient data linkage between systems, and narrow range of measures. Each of these issues have been evident during COVID-19 and have hampered policy efforts to tackle the pandemic, both nationally and in more localised contexts. We therefore require additional data sources to supplement and complement these traditional data systems to cover their gaps and feed into real-time decision-making.

The interconnectedness of humans across a complex Web of digital networks and systems heralded by the digital revolution is unprecedented. It has allowed for the close monitoring of human behaviour on a scale never seen before, offering new opportunities to monitor and tackle the spread of disease, including COVID-19. Core to understanding these opportunities is the concept of 'new forms of data'. New forms of data refer to non-conventional sources of information, often not created for research reasons but that can be repurposed to bring value for new research opportunities (Connelly et al. 2016; Timmins et al. 2018). Where traditional data sets may include interviews, administrative records, or surveys, new forms of data are broader in scope and might include wearable technologies, Internet of things, mobile phones, sensors, satellite imagery, loyalty cards, audio data, Internet records, or commercial transactions.

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New forms of data should not be construed as a replacement for traditional data sets. Rather, they can supplement, complement, expand, and fill in gaps within existing research data systems (Timmins et al. 2018). In particular, features of their design make them relevant for monitoring and tackling COVID-19. New forms of data are often incidental and generated automatically, providing low-cost systems that do not redirect much needed funds elsewhere. Data may be generated in near to real-time key given that COVID-19 can spread quickly across populations. Coverage can be wide which may allow access to information on hard-to-reach populations who have been often disproportionally affected by COVID-19. Importantly, data systems are embedded within social processes (e.g., social media records capturing social networks), which often mirror COVID-19 disease dynamics (e.g., social network facilitating the spread of infections).

2 Case Studies

In this section, we profile four new forms of data and how they have contributed to monitoring and tackling COVID-19. Our list is not exhaustive, merely examples that demonstrate the potential contributions of new forms of data above and beyond traditional data sources.

2.1 *Social Media*

The close connectivity of humans on popular online social networks has seen the utilisation of Internet-based communication technologies become habitually engrained into daily life. They offer opportunities to maintain social relationships, share personal details or life events, and engage in information sharing and seeking behaviours. Very few traditional data sets contain suitable information for social network analyses due to the difficulties and costs in data collection. This has seen social media data opening up new opportunities to researchers to study human interactions (e.g., Coviello et al. 2014).

One key area that social media data has been actively used in tackling COVID-19 has been deterring the sharing of misinformation across social networks. The sharing of 'fake news' posts, whether intentional or not, across social media platforms can create a dangerous disease ecology that allows COVID-19 to thrive. Digitally enabled emotional contagion (also termed 'infodemic') may facilitate the mistrust of vaccines and preventative interventions, hinder public information efforts, distract from underlying causes (e.g., burning of 5G masts in the UK), lead to panic buying, or cause rioting as witnessed in Ukraine. While platforms including Twitter and Facebook are actively hindering the spread of misinformation, this is a difficult task when faced with the scale of the issue.

2.2   Mobile Phones

The near ubiquitous use of personal mobile phones presents an almost constant stream of information about an individual's behaviours. While it may appear more relevant for high-income countries, numerous studies have shown mobile phone records to be cost-effective in measuring population locations and migration patterns in data-scarce countries (e.g., Deville et al. 2014). As such, researchers and governments have been actively collaborating with mobile network operators, operating software, and app developers to utilise the data that they offer (Oliver et al. 2020).

One key data opportunity concerns locational information (e.g., GPS records), which are rarely collected in traditional data sources. Records provide real-time information on population flows and mobility which are key for studying a pandemic. For example, Google and Apple have released data and analyses on mobility behaviours for countries and city-regions, including how often people are travelling for leisure, grocery shopping, or using public/private transport (e.g., Google 2020). Such data provide opportunities for evaluating the responses to policy interventions such as lockdown or social distancing.

Digital tracing is being trialled for the first time in population surveillance or for enforcing interventions such as self-isolation. For example, South Korea (Corona 100 m) and Singapore (TraceTogether) were early adopters of apps that alerted individuals if they had come into close contact with other individuals with COVID-19. The success of these systems has seen them being introduced or developed in many other countries.

2.3   Satellites

Imagery data taken from satellites provide regular and detailed information of every place on Earth. Satellites can now capture footage from a very high spatial resolution (e.g., three meters squared) and therefore provide detailed snapshots about human activity and the built environment. Live streaming of satellite data can therefore deliver a comprehensive, real-time situational picture of global, regional, and local consequences of COVID-19 quicker than many other types of administrative data.

During the pandemic, satellite imagery was the first data source to monitor changes in air quality demonstrating the large improvements in most air pollutants following national lockdowns and reduced human mobility (Dutheil et al. 2020). Night-time imagery capturing visible light intensity has been used to monitor geographical changes in energy consumption, indicating suburbanisation in patterns of energy consumption, with reduced consumption in city centres following lockdowns as individuals spend more time at home (Rowe et al. 2020). Satellite imagery has also been used to generate high-resolution maps in remote regions where we

have little or no data on where populations are located to aid responses towards preventing the spread of outbreaks (Facebook 2019; Zolli 2020). Satellites also offer the potential to monitor the economic impacts of COVID-19, as well as the pace of recovery, through tracking trade flows and economic activity (via monitoring vessel and port activities).

Satellite data have also provided an example of the need to think critically about the contribution of new forms of data. By analysing changes in hospital traffic lots, Nsoesie et al. (2020) used satellite imagery to suggest that the COVID-19 outbreak in Wuhan may have started in the fall of 2019. This study gained a lot of media attention and was shared by US President Donald Trump; however, it has been heavily criticised for comparing inconsistent images taken from different angles that may have produced misleading findings (Fang 2020).

2.4 Web Search Engine Trends

The use of online search engines (e.g., Google, Bing, Yahoo) has provided access to near-endless amounts of information about society and life. In particular, common searches include health information about personal symptoms (giving rise to 'Dr. Google' diagnoses). As many people now first turn to search engines, search trends may highlight issues quicker than waiting for individuals to present at health-care services. This can be important in a fast-developing pandemic. Online searches for COVID-19-related symptoms have provided early signs of localised outbreaks and the identification of previously unconsidered symptoms (Stephens-Davidowitz 2020).

Web searches also provide opportunities for studying the holistic responses to the pandemic. Google trends data have provided important insights on responses to lockdowns including the immediate increased interest in exercise and physical activity (Ding et al. 2020). Although search trends data cannot tell us about the implementation of behaviours, they provide early signs that traditional data sets can later confirm or refute. In the case of physical activity, capitalising on this greater interest and cementing it in habitual lifestyle changes may represent an important policy narrative.

3   Caveats of Using New Forms of Data

While new forms of data are contributing effectively in the response to COVID-19, they bring challenges to conducting research or tackling COVID-19. While a full review evaluating the issues they bring is beyond the scope of this chapter, we cover three core issues.

First, data governance concerns are key where data are not primarily collected for research purposes. Ethical issues, especially data ownership and consent for research, are non-trivial and often overlooked. While COVID-19 has seen a rush to

access data quickly, such issues should not be glossed over and remain paramount. Access to many new forms of data is often controlled by their creators who may not want to share their data (e.g., due to commercial sensitives) or place significant costs in acquiring them (Timmins et al. 2018). COVID-19 has seen many organisations work directly with national governments to provide data or analyses freely which has helped minimise this barrier. Trusted third-party organisations, such as the Consumer Data Research Centre in the UK, also offer services for opening up these data to researchers.

Second, data quality is paramount. As data are generated incidentally, the information provided may be less directly relevant to research user needs restricting their value (Connelly et al. 2016). Data are often not generalisable to populations and may even lack information on how representative they are. For example, Twitter data can only provide estimates about behaviours in people who use Twitter, and Twitter users are over-represented by younger populations. Poor-quality data are not useful and potentially harmful. To leverage frequent, real-time and rapid information on the progress of COVID-19 to inform responses, weighting approaches have been proposed to address these biases and produce reliable, high-quality data (Perrotta et al. 2020).

Third, new forms of data bring added complexity for handling and processing data. They often require innovative or novel methods for data storage, cleaning, and analysing data. Data are typically supplied in unstructured forms that are less conducive to conducting research 'out of the box'. These complexities can limit the rapid use of information derived from these sources. COVID-19 has seen growing engagement of scientists to improve documentation and provide open data or code to minimise these issues, although many gaps and difficulties still remain.

4 Conclusion

The first global pandemic in an era of emerging and burgeoning data sources brings new opportunities and challenges for responding to and tackling COVID-19. We argue that when new forms of data are used properly, carefully, and critically, they can bring added value to conventional research platforms. To achieve this, we need a future research agenda that (a) evaluates the quality of data sources and populations captured in each, (b) derives additional insight and value beyond traditional data sources, and (c) integrates data into actionable solutions, interventions, or systems. Though existing applications may not fully meet these criteria, there is considerable scope to build on examples utilising new forms of data for responding to COVID-19 as we drive forward such an agenda.

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and the identification of the spread of misinformation and 'fake news' across Twitter related to COVID-19.

Frances Darlington Pollock   is a lecturer in Population Geography at the University of Liverpool in the Geographic Data Science Lab. As a population and health geographer, Frances is interested in the interactions between people, places, and politics and how these relate to social and spatial inequalities in society. In particular, their work explores determinants of inequalities and social justice in the context of mobilities and migration, ageing, deprivation, ethnicity, and social mobility. Frances primarily uses quantitative methods and is interested in how new forms of data can be used in combination with traditional data sources to generate new policy-relevant insights to tackle inequalities and promote social justice.

Francisco Rowe   is a senior lecturer in Human Quantitative Geography and lead of the Geographic Data Science Lab within the University of Liverpool. His areas of expertise are human mobility migration, spatial inequality, and computational social science. His research exploits the strengths of traditional and new forms of data, particularly satellite imagery, mobile phone, smart card, and social media data. He works closely with the United Nations; UK's government organisations, including the Ordnance Survey and the ONS Data Campus; and commercial companies. His work contributed to the United Nations Expert group meeting on 'sustainable cities, human mobility and international migration' and the ONS Government Statistical Service Advisory Committee. Francisco's research has been recognised by an award for the best paper published in Spatial Economic Analysis in 2018 and having articles in the top 10 most read in *Transport Research Part C* (2018), *Spatial Economic Analysis* (2019), and *Population Studies* (2019).

Chapter 57
Knowledge Translation and COVID-19

Niamh Shortt

1   Introduction

As a health geographer, my main focus sits within health inequalities and, in particular, non-communicable diseases and the commercial determinants of health. During this global pandemic, it is easy to feel that perhaps those of us engaged in this area are doing the 'wrong' kind of health geography. We can feel helpless. Much of our research is however relevant, perhaps not directly in medical advances that can curb the disease but indirectly in our focus on inequality and the political economy. The importance of this work will become clear once we begin to emerge from lockdown and rebuild society during which we will require open channels of communication with those outside of academia. In a time of crisis, it is critical that those in positions of power understand the importance of evidence, the existence of inequalities and the voice of the 'expert'. Whilst COVID-19 may be consuming public health research and practice, we must not forget that the inequalities in health that existed before this pandemic are widening in response to it. Rates of non-communicable diseases, which we now know are risk factors for COVID-19, are highest in our most deprived communities. This coupled with higher employment in the gig economy, in jobs that offer little social protection, has forced many low-income groups to continue to work, risking personal exposure and resulting in higher death rates in the most deprived populations. Such inequalities were to be expected given what we know about previous pandemics (Ahmed et al. 2020). This chapter will begin by outlining the role of the expert during the early days of the COVID-19 outbreak. It will then outline three ways to conceptualise the research-policy connections during this time and as we begin to emerge into an altered society. It argues that experts from multiple, diverse disciplines are required to respond

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to current inequalities, both COVID-19 related and those that we know existed before, to build a fair society.

2 The Role of the Expert in a Post-Truth World

In 2016, the United Kingdom's (UK) Justice Secretary, Michael Gove, announced that people in the UK 'have had enough of experts'. This 'post-truth' model of politics both undermines official statistics and supports arguments that experts, including academics, are becoming increasingly redundant. We have seen this most clearly in arguments around climate change, where climate-changed deniers have worked tirelessly to undermine all expert knowledge and the experts themselves, both professionally and personally (Leiserowitz et al. 2013).

But have we had enough of experts, and where is the evidence for this? It may come as no surprise to suggest that such evidence is scarce. Indeed, research suggests that the public have high overall trust in scientists and other experts. The Wellcome Global Monitor 2018 asked more than 140,000 individuals in over 140 countries how they feel about health and science, concluding that 72% of people globally trust scientists (Gallup 2019). This trust however was not shared in all contexts, with variation between high- and low-income countries and trust lower in more unequal societies. Trust in medical and health advice from doctors and nurses was high across the globe with 84% trusting the advice from medical professionals and 76% trusting medical advice from government (Gallup 2019).

In the context of COVID-19, this level of trust is critical as experts are drawn into policy circles. Experts in this context however do not make the decisions but act as advisors to both inform and observe the processes. For example, in the UK, the Scientific Advisory Group for Emergencies (SAGE) is *'responsible for ensuring that timely and coordinated scientific advice is made available to decision makers to support UK cross-government decisions'* but further clearly stating that *'the advice provided by SAGE does not represent official government policy'* (SAGE 2020). Governments enrol the experts to provide advice but also to demonstrate that their decisions are based on scientific evidence. Nevertheless, if things go wrong, blame can be placed on the experts. Boswell (2020) has highlighted the risk of such a blame game, both for the experts and for the government, highlighting that *'science does not, and cannot, offer definitive answers to new and complex social problems – just propositions and hypotheses that are more or less robust'*.

At the same time, as we see the rise in the importance of experts, we have also witnessed an explosion in what the World Health Organization (WHO) have called the 'infodemic' (Caulfield 2020). This refers to the spread of misinformation regarding COVID-19, including cures ranging from bleach to light and causes related to conspiracies. In order to tackle such misinformation, experts in all areas are required. Whilst there is no 'one science', or 'the science' as it has become referred to by the media, COVID-19 has highlighted our need for experts focussed on particular fields. In the immediate aftermath of the outbreak, the majority of the experts afforded

airtime were those with expertise directly related to the spread of the virus, for example, epidemiologists, or those racing to find a vaccine, but as time moves on and we move out of lockdown, the focus on recovery will require experts from all fields. This will include those not directly related to pandemics or infectious diseases but those focussed on building a fair society, including health geographers (for example, those working on health-care accessibility, inequalities and active travel, to name just a few). To prepare for that, academics will need to gain a better understanding of the policy-making environment.

3 Research-Policy Connections

To gain a better shared understanding between researchers and policymakers regarding both the research and policy process, we need to improve our knowledge of each other's working environments. Our conceptualisation of both expertise and knowledge transfer in the time of a pandemic should acknowledge the immediate need to respond to the fast-moving disease, the politics of decision-making and an 'enlightenment' model (reflecting the work of Weiss (1979)) that shapes the response in the long term. Reflecting on these approaches, we can explore how they may have played out in the time of the pandemic and, indeed, how they may continue to emerge as we move out of lockdown.

The first, related to more traditional notions of knowledge transfer where knowledge drives policy, or responds to immediate concerns, is largely how many view the translation of knowledge to policy. Such a notion would suggest that in the response to COVID-19, experts were pulled together, and scientific evidence was used to shape all decision-making. We saw this in the early stages of the pandemic with phrases such as 'listening to the scientists' and 'guided by the science'. Notably, scientists were often seen at press conferences, flanking and propping up the politicians (see, for example, Chris Whitty in the UK, Tony Holohan in Ireland, and Anthony Fauci in the USA). Politicians employed this approach to show the public that the decisions that they made were not 'political' per se, but scientific, attempting to demonstrate their 'rigorous' and 'evidence-based' approach. Such accounts of knowledge translation are however rare, and the majority of research in the area of knowledge translation would suggest that this linear-based approach *'fails to capture the intricacies of the interactions between research and policy'* (Boswell and Smith 2017, p. 3).

The second approach, shaped by a political model, is typified by a selective use of evidence to serve political ideas. The approach suggests that the politics and ideologies at play can shape knowledge and policy responses on particular issues. Rather than using research to respond to the emerging situation, research is used to fit a particular narrative or policy decision already made. We also see increasing influence of powerful interest groups. For example, during COVID-19, we began to see the emergence of influential groups putting pressure on governments to release economies from lockdown faster than the scientific advice suggested. What is not

made evident by those in power are the ways in which politics may also shape knowledge and policies and that *'power relations are implicated in the construction of expert authority'* (Boswell and Smith 2017, p. 4). Questions such as who advises the government, how transparent these decisions are, what 'science' these decisions are based on and whether research is chosen to support dominant ideas of a particular political party are all shaped by those in positions of power that direct the policy agenda. Even if those advising the government are neutral and the research underlying their expertise and scientific models is apolitical, the decision of whether or not to use this evidence is political.

A third approach, shaped by an enlightenment model (Weiss 1979), reflects a more dynamic relationship between research and policy. This model perhaps most closely represents the mundane way that policy is shaped with a slow percolation of ideas into the public consciousness (Monaghan 2011). In this model, policy can be influenced over long periods, through shifting perceptions and ensuring that issues, such as inequalities, remain on the agenda. Health geographers have been reporting on health inequalities for many years. Whilst we may not recognise the role that this has played, it has contributed to the large body of evidence that we have on how unequal systems and structures result in unequal patterns of ill-health, disease and death. It could be argued that as a result of this body of research, the basic principle that health inequalities are caused by social inequalities is largely accepted (though not always acted on; see politics model above). As we emerge from lockdown, this research becomes critical as the inequalities that existed before COVID-19 will still be there for us to challenge using the evidence base. I say critical because these inequalities will have widened and will be further entrenched. New evidence has emerged to demonstrate the unequal impact of COVID-19. For example, black and minority ethnic groups have a higher mortality rate (Kirby 2020), domestic violence rates have increased during lockdown (Bradbury-Jones and Isham 2020) and we have witnessed a disproportionate effect of unemployment on women and those on low incomes (Douglas et al. 2020). The higher risks experienced by these groups are themselves a reflection of the broader social determinants of health, including systemic racism, and the patriarchal structures of society, issues that health geographers and those working in the field of social epidemiology have been reporting on for many years (examples include Dyck 2003; Coen et al. 2018; Krieger 2020; Krieger et al. 2020). In a previous paper, we have highlighted the value of the 'enlightenment model' approach to research impact (Shortt et al. 2016). This approach takes me back to my earlier reference to the initial feeling of doing the 'wrong' kind of health geography in the early days of COVID-19. Taking an enlightenment approach means that our research, particularly that on inequalities, is important at all times and exerts influence over time, not just at critical moments. In this preferred model, we don't see the immediate impact of our research. Instead, it is a 'slow drip' recognising that our research is part of an overall picture that shapes wider understanding and can contribute to change in the longer term. That is not to say that we should not enter a responsive mode from time to time. We should, but we should also continue to work, publish and engage with important issues such as inequalities when they are not in the news cycle. Such a model must also recognise

the false narratives of a singular science, reflected in political references to 'the science', and appreciate the balance of multiple forms of evidence from various disciplines required for policymaking.

4 The Role of the Expert in Shaping a New World Order

A programme of recovery that includes policies that respond to the economic and social deficits resulting from COVID-19 will have a lasting effect on health and well-being. How we as a society respond to the impact of COVID-19 on welfare safety nets, housing, access to health care, child poverty, education gaps, pollution, travel, working practices and much more will be shaped by political decisions. Such decisions should not be left to politicians alone but involve expertise, knowledge and skills from multiple disciplines, including those driven by matters of social justice, to ensure that any policy response takes both existing inequalities, and inequalities that may emerge from the policies, into account.

Wardle has argued that in order to fight misinformation, we need to *'swamp the landscape with accurate information'* (Caulfield 2020). In response, Caulfield suggests that to do so, we need to write in the popular press, give public lectures, and respond to reporters—in other words, we need to leave the universities and provide our expertise at all times, perhaps most especially so at this critical juncture when we have the chance to build a more fair society.

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Chapter 58
Examining Geographical Visualizations of COVID-19

Leah Rosenkrantz and Nadine Schuurman

1   Background

The use of maps to visually represent aspects related to disease dates back to the time of the Black Plague (Koch 2017). Maps have proven to be an effective visual to communicate geolocated data for numerous pandemics like the Spanish flu, SARS, and Ebola. COVID-19 is not novel in this regard. However, the role maps played during this pandemic differed (Rosenkrantz et al. 2021).

For starters, we witnessed a deluge of Web-based maps on COVID-19 when the disease first emerged in late 2019. Historically, maps of disease were produced by professional cartographers, but the rise of open-source cartographic software in the last decade made Web-based mapping of COVID-19 a popular pursuit available to anybody with an Internet connection and some technical know-how. Though this was a largely positive democratization of cartography (Mooney and Juhász 2020), the abundance and accessibility of such "ready to use" interactive mapping software (e.g., ArcGIS online, Tableau) made certain styles of COVID-19 maps (e.g., choropleth, graduated symbols) more ubiquitous than ever.

Maps of COVID-19 were also central to how governments, public health agencies, and news outlets were relaying information to the public. We live in an increasingly visual world, where visual forms of media often supersede the written word in terms of public information consumption. Maps have thus become a key communication tool given their ability to efficiently visualize events on the face of the earth in a manner that is difficult to replicate through text or tables alone. While some of the COVID-19 maps that were produced are excellent examples of geographic representations of COVID-19, others fell short, often misrepresenting the state of the

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pandemic and contributing at the time to what the World Health Organization (WHO) called an "infodemic,"— that is, an overabundance of information that makes it difficult for people to discern between what is a trustworthy and reliable source of information and what is not (WHO 2020).

The first section of this chapter discusses the deluge of maps produced on COVID-19, and the common cartography pitfalls encountered. We also discuss why despite the initial profusion of maps, we were only telling a small portion of the COVID-19 "story." The second section explores the data issues that contributed to this mapping rut and how Geographic Information Science (GIScience) can be used to get us out of it.

2   A Mapping Deluge

From the very start, COVID-19 maps emerged as a way to depict the number and geographical region of those infected, those recovered, and those who died as the disease rapidly spread from place to place. Although these kinds of incidence and prevalence maps are common to public health and epidemiology, the sheer number of Web-based maps that emerged to represent the spread and impact of COVID-19 was decidedly uncommon.

The vast majority of COVID-19 maps that modelled incidence or prevalence rates took on the form of either a graduated or proportional circle map or a choropleth map. Though some of these maps were professionally produced and served as informative resources on COVID-19, many others failed to consider even the most basic tenets of good cartography such as inclusion of north arrows, scale stability, and the use of consistent units of aggregation (Mooney and Juhász 2020; Field 2020). Subsequently, they were either difficult to interpret, misleading, or both (Mooney and Juhász 2020).

One common example where mistakes were made were choropleth maps. Choropleth maps use shaded or patterned areas to represent spatial variations in geolocated areal data. They assume constant density over the area being shaded and therefore must map relative data (e.g., number of cases per 100,000 people) to allow the reader to compare one area to another. Yet numerous choropleth maps reported absolute data related to COVID-19, such as total number of cases or fatalities for an area, with complete disregard to each area's population density (Fig. 58.1). Several of these maps also overclassified their data (i.e., they used too many gradations), making it difficult to discern which color is which, adding to interpretation challenges.

Figure 58.1 presents an example of a poorly constructed choropleth map on top (*map A*) and a corrected version on the bottom (*map B*). With *map A*, the absolute number of cases are being mapped by state. However, because not all states have the same population density, using absolute values such as case counts can be misleading. For example, in *map A*, California is shown to have very high numbers of cases, signaling to a reader that the danger due to COVID-19 here is higher. But *map B*,
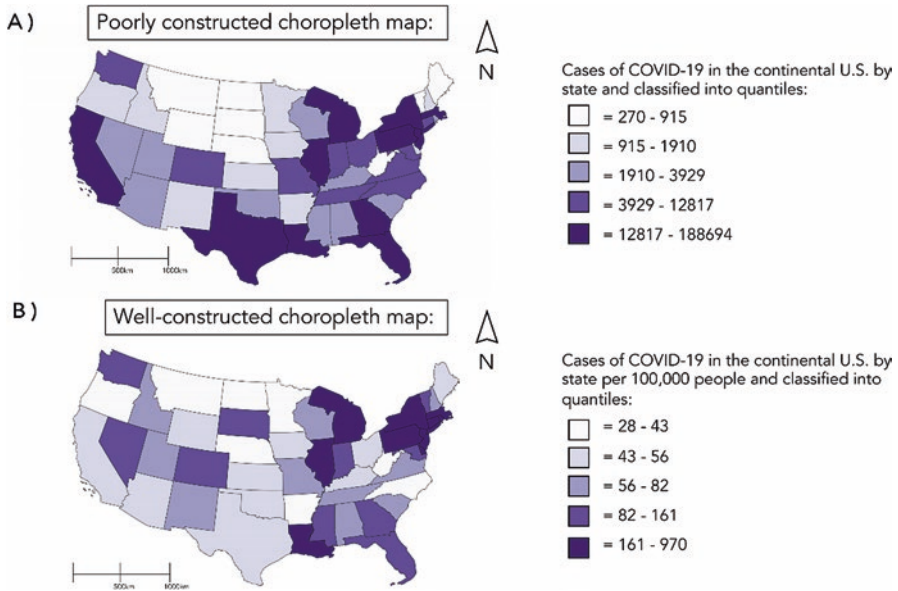
Fig. 58.1 An example of two choropleth maps illustrating cases of COVID-19

which maps cases per 100,000 people (i.e., a relative value), indicates that California has a relatively low number of cases per 100,000. Choropleth maps should always map relative values to avoid misrepresentation.

On the other hand, graduated or proportional symbol maps, which use shape size as proportional to the data, can map *either* relative or absolute data. The most common pitfall with these maps was the use of improper scale coupled with low-resolution data. At too large a scale, graduated circles overlap each other to the point that it is impossible to determine which area each circle represents. Though increasing symbol transparency or using dynamic maps that scale can help mitigate this issue, symbol congestion can ultimately impinge a map's readability and distort the information that the mapmaker is trying to convey (Fig. 58.2) (Field 2020). Another common issue with this style of map is the inconsistent use of units of aggregation. This is especially common with Web maps on a global scale, where in some cases, COVID-19 infections were represented at the country level, and in other cases, they were represented at the provincial, state, or even county level.

Figure 58.2 presents an example of a difficult-to-interpret graduated cylinder on the left (*map A*) and an improved version on the right (*map B*). As you can see, the circles in *map A* are too big; in some cases, they cover entire countries, and a few even overlap with other circles, making it difficult to interpret the information being represented. With *map B*, this issue has been resolved by reducing the overall sizes of the circles used and making them semitransparent to allow country borders and any remaining overlapping circles to be visible. In general though, graduated
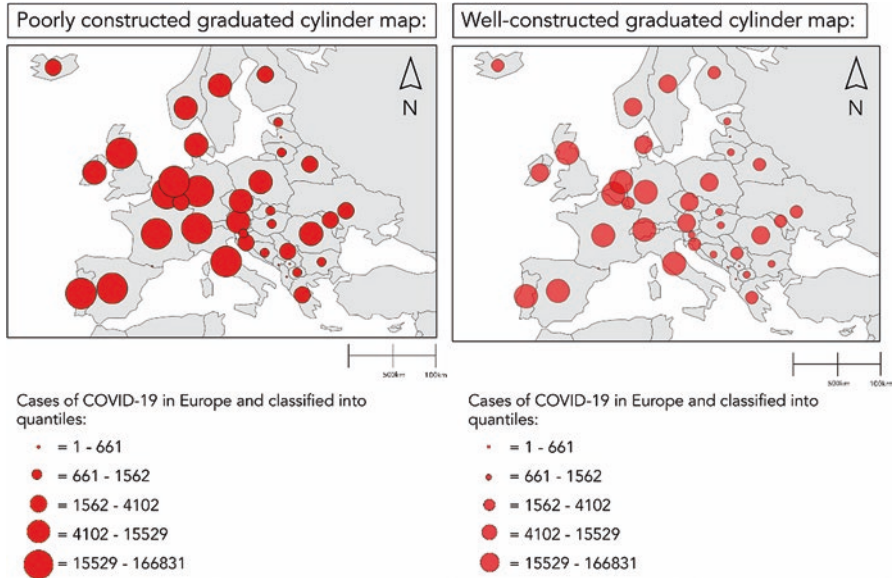
Fig. 58.2 An example of two graduated circle maps illustrating cases of COVID-19

cylinder maps are often low resolution, and it is difficult to improve on this without higher-resolution data.

These cartographic missteps were not only specific to Web-based mapping. More traditional forms of maps displayed online or in print as static images suffered from similar blunders (Mooney and Juhász 2020). As Monmonier wisely reminds us in his well-known book *How to Lie with Maps*, a healthy dose of skepticism when interpreting maps is essential and cautions that "because of advances in graphics software and online mapping, inadvertent yet serious cartographic lies can appear respectable and accurate" (2018, p. 250).

Cartographic mistakes aside, what is so wrong with having had this profusion of COVID-19 maps? Without question, prevalence and incidence of disease are important statistics that should be mapped. However, these maps only told a small portion of the COVID-19 story. As Jonathan Everts (2020) notes in his article, *The Dashboard Pandemic,* the choice of choropleth and graduated circle maps to portray COVID-19 statistics masks certain risk groups and obscures small-scale patterns of disease. Essentially, these maps suggest that within a specified, territorially defined area, the burden of disease was shared by all equally, which we know was far from the truth (Everts 2020). The continuing ubiquity of these styles of maps is partly due to the profusion and easily accessible nature of "ready to use" interactive mapping software by amateur cartographers. But it was also in large part the result of messy health data and a lack of high-resolution spatial data that initially limited the type of spatial analyses possible.

In the following section, we discuss issues related to COVID-19 data for map-making purposes and how GIScience helped to overcome them.

3 Dealing with the Data

If we envisage a map as the top portion of the hypothetical iceberg, then the 90% below the surface is constituted by the data. Mapping COVID-19 for much of the pandemic was limited by two key elements: messy and incomplete health data and a paucity of high-resolution spatial data.

3.1 *Messy Health Data*

At the beginning of the pandemic, the rapid spread of the coronavirus and high transmission rates overwhelmed health systems. In particular, public health records suffered from numerous irregularities in data collection, particularly around testing for the virus, as well as in how this data was reported (Platt 2020; Smart 2020). Consequently, any sort of higher-level analysis of this data was forced to grapple with these inconsistencies.

As an example, let's discuss the use of case counts as an indicator for COVID-19. Mapping case counts of COVID-19 can be problematic for a few reasons. Due to the incubation period of the virus and the time required for testing, case data lags about 2 weeks behind at minimum, representing the recent past rather than the present (Brunsdon 2020). Case counts are also highly dependent on the testing capacity of a region, meaning that they are likely an underestimate anywhere where testing capacity has been limited (Brunsdon 2020). At the beginning of the pandemic when labs were still adjusting to the flood of testing, daily spikes in cases often meant a backlog of tests being cleared rather than true daily counts. Finally, since testing capacity and strategy vary over time and place, it was extremely difficult to analyze case counts longitudinally or across regions, making this indicator difficult to work with from a spatial perspective.

Hospitalization and death data are typically more reliable than case counts; however, their use comes with some major caveats. First, due to the virus' incubation period, both indicators are representative of the recent past and not the present. There was also evidence that mortality-related events were not being systematically tested and coded, likely leading to substantial undercounts of death ("The Fatal Flaws" 2020). Lastly, these indicators were often disproportionately affected by outbreaks in long-term care homes (Walsh and Semeniuk 2020; Yourish et al. 2020). Taken together, these limitations made accurately mapping health data difficult to do.

Consequently, the best maps accounted for these data inconsistencies. Figure 58.3 shows case counts using a 5-day rolling average to help prevent major events (such as a change in reporting methods or a clearing of testing backlogs) from skewing the
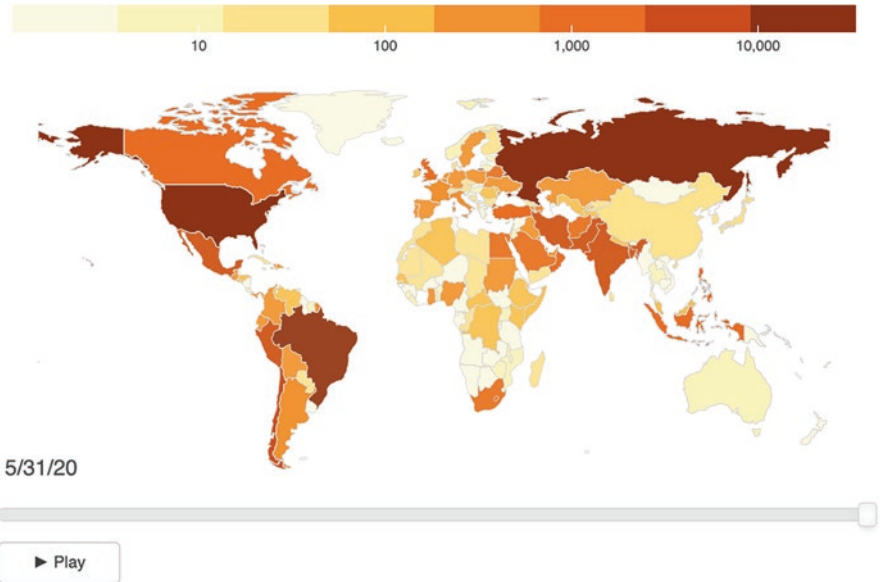
Fig. 58.3 John Hopkins animated map of daily confirmed cases of COVID-19 using a 5-day moving average (John Hopkins Coronavirus Resource Center 2020)
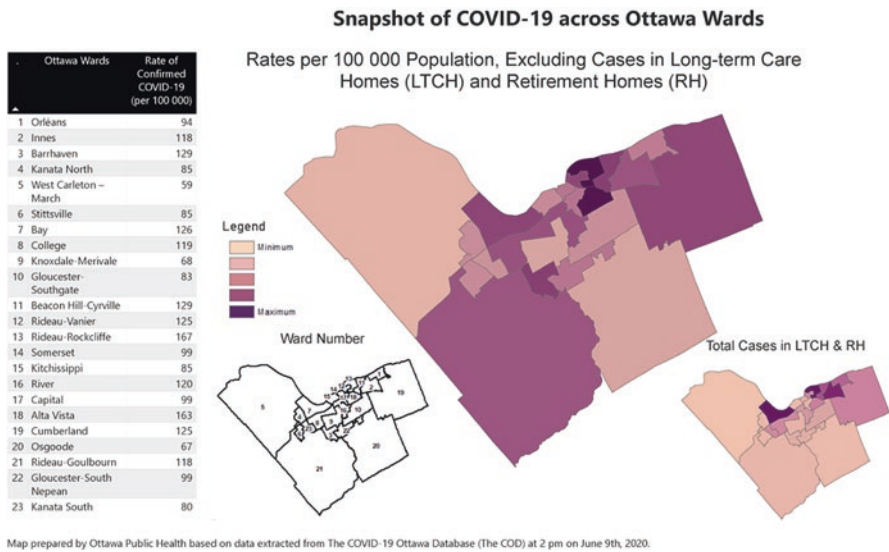

Fig. 58.4 Ottawa Public Health's map of COVID-19 case rates, excluding cases in long-term care homes and retirement homes (Ottawa Public Health 2020). (source: Contains information licensed under the Open Government License— City of Ottawa)

data (John Hopkins Coronavirus Resource Center 2020). Figure 58.4 shows the prevalence of lab-confirmed cases per 100,000 people in Ottawa, based on the home location of those individuals (Ottawa Public Health 2020). Importantly, their data was filtered to exclude long-term care homes and retirement residences where outbreaks of the disease would have inflated overall rates.

Another major issue with the health data for COVID-19 was the lack of information being collected and reported on race and ethnicity. In Canada, statistics based on race or ethnicity are not collected unless individual groups are found to have risk factors (Williams et al. 2020). Despite early anecdotal evidence that Black, Indigenous, and People of Color (BIPOC) in Canada faced greater infection rates than white Canadians (Bowden 2020; Alliance for Healthier Communities 2020), and the scientific evidence in the United States that BIPOC are indeed at higher risk (Oppel et al. 2020; CDC 2020; APM Research Labs 2020), provincial health officials were slow to begin collecting racial data, and certain provinces remained resistant (Boyd 2020; The Canadian Press 2020; Watson 2020; Andrew-Gee 2020). The situation in the United States was somewhat better—at the time of writing, 47 states had released confirmed cases of COVID-19 data by race, and 43 states had released COVID-19 mortality by race ("State COVID-19 Data by Race" 2020). Still, only four states had released COVID-19 testing data by race ("State COVID-19 Data by Race" 2020), and the overall process took months before race-based data began to be collected and made available to the public.

Despite these current shortfalls in data coding, GIScientists were in a unique position to help tell a more complete story of the COVID-19 pandemic, particularly with regard to its differential and unjust impact on BIPOC communities. By adopting a GIScience approach, researchers were able to harness the power of data linkage and analysis properties, comparing the limited COVID-19 data that was available with the most recent census data to expose the uneven and unjust geographies of the pandemic (Everts 2020). This allowed researchers to identify and map the racial breakdown of areas hit particularly hard by the disease, as well as monitor changes in the underlying causes of death to better locate anomalous patterns of
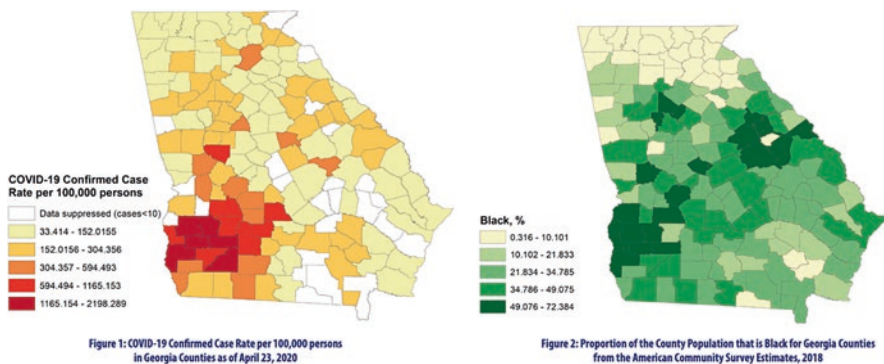

Fig. 58.5 Maps of Georgia showing the often-high burden of COVID-19 in areas with high percentages of Black people (Gaglioti et al. 2020, p. 6). (Source: Morehouse School of Medicine National Center for Primary Care: www.msm.edu/ncpc)

mortality that may be attributed to racial disparities in risk and care access during an outbreak. Figure 58.5 shows an excellent example of a map that compared the racial makeup of counties in Georgia, United States (US), and how they had been affected by COVID-19 (Gaglioti et al. 2020). Visualizations like this are critical for illustrating the unequal geographies of this pandemic.

3.2 Lack of High-Resolution Spatial Data

A lack of high-resolution spatial data also initially limited the types of maps produced at the beginning of the COVID-19 pandemic. Due to privacy concerns, public health agencies chose not to release data at a high resolution, limiting the detection of meaningful patterns. In North America, COVID-19 data was predominantly reported at low resolutions, with cases typically linked to the county, city, or state level (LA County Department of Public Health 2020; "Public Health - Seattle and King County" 2020; "NYC Coronavirus Disease 2019" 2020). While this data was useful for getting a big picture of the virus' spread, it limited more nuanced types of analysis that would have allowed us to identify hot spots at a community level and subsequently allocate resources more appropriately. Moreover, it made the assumption that infected individuals are static beings that can be neatly assigned to a single area such as their county, city, or state, without ever leaving these boundary lines to shop for groceries, buy gas, or visit a close relative.

In spite of this, many GIScientists worked to confront this paucity of high-resolution spatial data, helping tap into the individual trajectory data of infected individuals as they moved about their daily lives (Rosenkrantz et al. 2021). For example, GPS, cell phone tower signals, or Wi-Fi connections can all be used to track and collect data on people's daily trajectories. Together with data on COVID-19 infection status, individual trajectory data allowed researchers to hone their analyses in on actual hot spots, instead of large areas that infected individuals may have never set foot. It also gave the important ability to contact trace more efficiently and effectively than by memory alone.

While countries around the world used this technology to much success in controlling COVID-19 outbreaks by tracking their citizens, neither the United States nor Canada participated in this "big brother"-type surveillance due to obvious issues around privacy (Calvo et al. 2020). Instead, some researchers and the private sector focused their efforts on what is known as Volunteered Geographic Information (VGI). VGI is a term coined by the renowned geographer Michael Goodchild back in 2007 to describe the increasingly popular phenomena of citizens engaged in the creation of geographic information (Goodchild 2007); essentially, in the case of COVID-19, citizens were volunteering their health and location data to actively surveil themselves.

The urgency of the COVID-19 pandemic drove the development of a number of local-scale VGI Web and mobile apps like "COVID Near You" (Fliesler 2020), "COVID symptom tracker" (2020), "Flatten" (2020), and "Private Kit: Safe Paths"
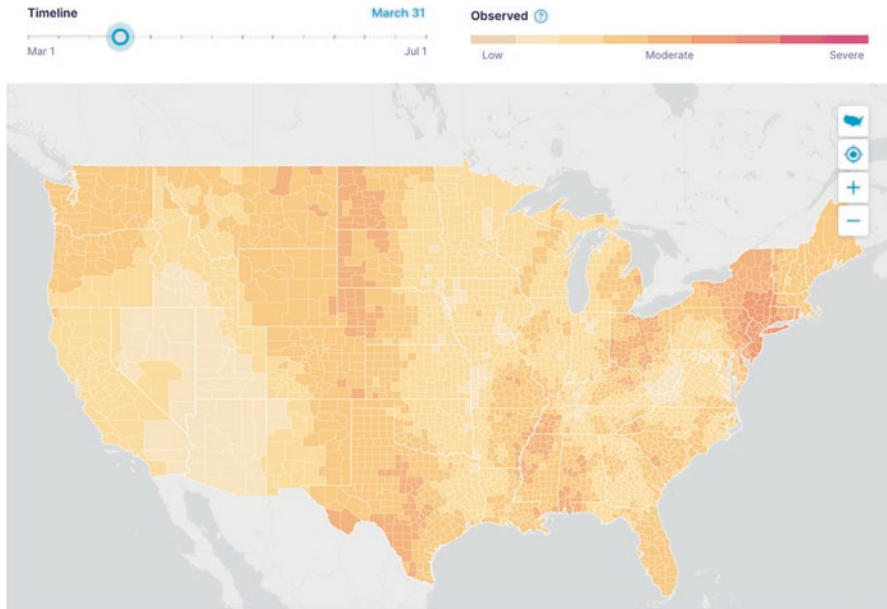
Fig. 58.6 Kinsa's map of influenza-type illness over on March 31 ("US Health Weather Map" 2020)

(2020). Companies like Kinsa Health were also in the VGI space, and used existing technology in their smart home thermometers to collect volunteered health and location data to track feverish illness across the country ("US Health Weather Map" 2020) (Fig. 58.6). Though this data does not distinguish COVID-19 from other feverish illnesses, it is a robust database with the capability to detect and map abnormal spikes in fevers and is thus an excellent example of how VGI helped serve as an early indicator of COVID-19 hot spots at the community level ("US Health Weather Map" 2020; McNeil 2020). The major downside to VGI of course is getting enough users to embrace it. Even during a pandemic where the sense of urgency was high, user numbers often remained low.

4   Conclusion

Maps and spatial analytics played a critical role in our understanding of COVID-19. While there have been some blunders, the pandemic has shown us how important it is for geographers and spatial analysts to work with domain experts to optimize communication for the purposes of reaching a large audience and provide policy makers with reliable evidence. In addressing potential future pandemics, it is important that data, spatial analyses, and maps are based on defensible principles from cartography and spatial epidemiology.

What is covered in this chapter is just a small sampling of the possibility for spatial representations and analyses of COVID-19. There is still more that can be explored retrospectively by adopting a GIScience approach. We can and should continue to explore other important aspects of the pandemic, so that we can tell a more nuanced story of COVID-19.

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Chapter 48

An error in the production process unfortunately led to publication of this chapter prematurely, before incorporation of the final corrections. The version supplied here has been corrected and approved by the authors.

Chapter 9

The original version of this chapter was inadvertently published with the author's name listed as "**Josh Evans**." It has now been updated to "**Joshua Evans**" in the chapter opening page & table of contents.

Chapter 37

The original version of this chapter was inadvertently published with the second author's name incorrectly spelled as "**Marco Garrido Cumbrera**". The author's name has now been updated as "**Marco Garrido-Cumbrera**" in chapter opening page & table of contents.

The updated online versions of the chapters can be found at
https://doi.org/10.1007/978-3-030-70179-6_9
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Chapter 41

The original version of this chapter was inadvertently published with the chapter author name incorrectly spelled as "**Beth Greenbough**". The author name has now been updated as "**Beth Greenhough**" in chapter opening page & table of contents.