

Global Perspectives on Health Geography

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

COVID-19 and Similar Futures

Pandemic Geographies

 Springer

Global Perspectives on Health Geography

Series Editor

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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 entirety—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, socationatures, geopolitical landscapes, global dynamics and processes, multi-scaled 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; Brunson 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; Jauhainen 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 Craddock'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 arising 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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