TRANSPORT AND PANDEMIC EXPERIENCES

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TRANSPORT AND SUSTAINABILITY
VOLUME 17

TRANSPORT AND PANDEMIC EXPERIENCES

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Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2022

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 978-1-80117-345-2 (Print)
ISBN: 978-1-80117-344-5 (Online)
ISBN: 978-1-80117-346-9 (Epub)

ISSN: 2044-9941 (Series)

ISOQAR certified Management System, awarded to Emerald for adherence to Environmental standard ISO 14001:2004.

Certificate Number 1985
ISO 14001

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ACKNOWLEDGEMENTS

This book would not have been needed if COVID-19 had not become a pandemic. We record here our sorrow and condolences to all those people in the world who have been touched by the pandemic and who have lost their lives.

This book could not exist without our authors who have so willingly contributed their knowledge. Without exception, they have responded quickly to all our editorial demands which have made our lives, as editors, as easy as they could be. Our authors come from all parts of the globe and we have enjoyed working with them, facilitated by the technology that we now all take for granted.

Apart from the authors, there are many individuals who have contributed behind the scenes – too many to list here but we hope they know that we know who they are. Special thanks must go to Steve Ison who encouraged us to start this journey.

And whilst it is not so usual to acknowledge the support of our families, we feel we must do so here as undertaking this enterprise, where time has been of the essence, has meant that homelife has had to be very patient – especially our dogs who do not understand why their needs are sometimes a second place to work needs.

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PART 1

INTRODUCTION

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CHAPTER 1

TRANSPORT AND PANDEMIC EXPERIENCES: AN INTRODUCTION

Maria Attard and Corinne Mulley

ABSTRACT

Transport and pandemics are interlinked given the ubiquitous nature of modern transport systems. The COVID-19 pandemic has provided much evidence for both virus contagion but also containment and how transport plays a role in both. As the world and its cities experienced lockdowns, there were travel restrictions, physical social distancing rules, transport systems shut down, changed operations, a re-opening with lower demands in some sectors (e.g., air transport and urban public transport services) and an increased demand in others (e.g., freight and home deliveries). These changes brought about a series of reactions at all levels, from governments and local authorities, operators of all transport modes but also personal and individual behaviour. This volume provides evidence on an array of transport and pandemic experiences through a collection of works from around the world, each chapter discussing a mode, a region and possible future outcomes. This introductory chapter provides the context for this volume with an overview of literature that looks at transport and pandemics, a timeline of events that marked the COVID-19 pandemic developments across different parts of the world, and finally an overview of the chapters in the volume. It concludes with some insights from the editors on the future of transport in a post-COVID world.

Keywords: Pandemic; COVID-19; transport; mobility; travel behaviour; transport policy.

Transport and Pandemic Experiences
Transport and Sustainability, Volume 17, 3–13

ISSN: 2044-9941/doi:10.1108/S2044-994120220000017001

INTRODUCTION

A pandemic is the occurrence of an illness in a community or region (an epidemic) occurring worldwide or over a very wide area, crossing international boundaries, and usually affecting a large number of people (adapted from Porta, 2008). Several pandemics have been recorded in human history with some having devastating effects on the world's human population. Recent pandemics include the 1918 H1N1 influenza A virus, more commonly known as the Spanish flu and causing between 20 and 50 million deaths, the 1957–1958 Asian flu caused by an A(H2N2) virus which caused 1–4 million deaths, and the Hong Kong Flu, caused by an A(H3N2) virus, which caused a similar number of deaths to the Asian flu. The first major pandemic influenza in this century was the 2009–2010 Swine Flu caused by an A(H1N1) virus which killed between 100,000 and 400,000 people. The 2009 Swine Flu was the first pandemic for which a vaccine was developed, produced and deployed within the first year.

At the time of writing this book, the world is facing its latest pandemic. The COVID-19 pandemic has led to significant impacts on the global human population in terms of infections and mortality, as well as on all other economic, social, infrastructural and environmental systems. As of March 2022, the interactive, real-time web-based COVID-19 dashboard developed by Dong et al. (2020) at John Hopkins University showed that the COVID-19 pandemic had infected over 466 million people and registered over 6 million deaths worldwide (https://coronavirus.jhu.edu/map.html).

Transport and pandemics are indeed interlinked because of the ubiquitous nature of modern transport systems including air and freight transport which have global reach and influence. Transport is a vector in a pandemic and transport networks shape the way that pandemics diffuse over large areas and eventually globally. Although air transport networks and airports are generally the first focus of attention during pandemics, freight transport networks also become an important contributor, with disruptions in the movement of goods being potentially more critical and damaging to the overall recovery (Luke et al., 2008). On the other hand, and as experienced widely during the first months of the COVID-19 pandemic, lockdowns and travel restrictions affected mobility demand and transport systems on land, at sea and in the air. Airport closures and the air travel bans alone led to a drop of 43% indirect aviation jobs globally (Air Transport Action Group, 2020).

There is now substantial evidence of the impact of lockdowns on public transport systems (Tirachini & Cats, 2020; Vickerman, 2021) and the benefits of reduced car mobility in cities such as reduced air pollution (Malpede & Percoco, 2020; Nieuwenhuijsen, 2021; Slezakova & Pereira, 2021) and in some cases, deployment and retention of car reduction measures in cities to promote physical social distancing and active travel (Bereitschaft & Scheller, 2020; Malpede et al., 2020). All these effects, and others that have affected travel and transport have inspired this book. The *aim* of this volume is to provide an overview of experiences across geographies and modes, and to a certain extent, inform the future of mobility and transport systems as the world recovers from the pandemic and

sets its eyes on the impending challenges of climate change. In terms of lessons learnt, the volume also provides evidence to improve resilience in the face of future pandemics.

This book is structured into four parts with a broad introductory section looking at more generic topics of geography and policy with respect to the COVID-19 pandemic and transport, a second part dealing with travel behaviour in different geographic settings and how this was affected by the pandemic and a third part bringing together initiatives and policies from across the world. The fourth and final part strives to identify what the future looks like with respect to key themes.

Before we proceed to detail the content of this volume, the following section briefly describes the development of the COVID-19 pandemic so far, in an attempt to better contextualise the contributions of the various chapters and shed light on the possible future beyond COVID.

COVID-19 PANDEMIC

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. Coronaviruses (CoVs) are a large family of viruses, several of which cause respiratory diseases in humans, from the common cold to more rare and serious diseases such as the Severe Acute Respiratory Syndrome (SARS) and the Middle East Respiratory Syndrome (MERS), both of which have high mortality rates and were detected for the first time in 2003 and 2012, respectively.

Coronavirus (COVID-19) was first detected in humans in December 2019 in Wuhan City, China (WHO, 2020). The development and spread of the pandemic are detailed in Table 1.1. Main milestones are identified and key events marking the pandemic so far are described.

Table 1.1. A Timeline of Selected Events During the COVID-19 Pandemic.

Date	Location	Description
December 2019	Wuhan, Hubei Province, China	The WHO China Country Office is informed of a number of cases of pneumonia of unknown etiology (unknown cause) detected in Wuhan. Later, on 20 January 2020, Chinese experts confirm human-to-human transmission
January 2020	Thailand, Japan and USA	Thailand and Japan confirm the first imported cases of novel coronavirus from China. The USA begins the screening of passengers on direct and connecting flights from Wuhan. The USA detects its first infection
February 2020	France, UK and Egypt	First coronavirus fatality in Europe is recorded. The UK records its first infections. First case in Egypt and first in the African continent
March 2020	Italy	Rising infections and deaths in Italy with an overwhelmed health system and rising infections and deaths. The whole country goes into lockdown on 9th March

(*Continued*)

Table 1.1. (*Continued*)

Date	Location	Description
March 2020	World	WHO declared COVID-19 a pandemic. Global lockdowns and stay home restrictions are mandated across many countries. In the USA, cruise ships are ordered to stop all activity
June 2020	Europe and East Asia	Slow reopening of airports as the first signs of the economic impact start to show
July 2020	USA and Europe	USA experiences a surge in cases, whilst Europe, Canada and Australia show signs of recovery
August 2020	Europe	Some levels of normality are recorded with borders reopening across Europe and infections stable and in decline
September 2020	Europe and India	As winter approaches number of infections start rising again in Europe. India is still in the middle of its first wave.
October 2020	New Zealand	New Zealand declares itself virus free
November 2020	Europe and USA	A second wave brings back lockdowns and restrictions in many European countries whilst the US still battles large number of deaths
December 2020	USA and UK	First vaccines are approved and the first woman is given the vaccine on 8th December in the UK
January 2021	World	First coronavirus variants (Brazil, South Africa) appear in the USA. Vaccinations roll out at a fast pace, although disparities across continents are evident
June 2021	World	Vaccination programmes are maintained with new variants affecting number of infections (e.g., Delta in India) across different regions of the world
November 2021	World	Omicron (South Africa) spreads and once again brings increases in the number of infections towards the end of the year and causes disruptions over end-of-year celebrations in many countries, temporarily affecting travel and workforce availability. Booster vaccines are rolled out to counter the Omicron 'variant of concern'
February 2022	World	Many parts of the world are now on the path to controlling the virus. WHO also reports positive signs of recovery in Africa for 2022. Following increased vaccinations, there is also hope for a decrease in infection numbers in Latin America and the Caribbean, where resources and health systems struggled to control and manage the pandemic
March 2022	World	Rhetoric begins to change in many countries to 'Living with Covid' as governments open up economies, in many cases against increasing numbers of infections but arguing that vaccination is the best form of defence

Source: Compiled by authors from various internet sources.

Table 1.2. Number of Cases and Deaths Caused by COVID-19 by Region.

Region	Cases	Deaths	Countries Reporting Most Deaths
Africa	11,434,995	250,893	South Africa (99,725), Tunisia (28,062), Egypt (24,277), Morocco (16,039) and Ethiopia (7,486)
Asia	109,376,701	1,246,923	India (515,877), Indonesia (152,437), Iran (138,949), Philippines (57,625) and Vietnam (41,477)
America	149,518,189	2,667,857	USA (965,105), Brazil (655 249), Mexico (321,115), Peru (211,579) and Colombia (139,315)
Europe	183,944,230	1,883,711	Russia (361,344), UK (163,079), Italy (156,868), France (153,824) and Germany (125,856)
Oceania	3,904,300	8,632	Australia (5,591), Fiji (834), French Polynesia (645), Papua New Guinea (639) and Guam (338)
Other	705	6	Deaths reported from an international conveyance in Japan

Source: European Centre for Disease Prevention and Control, March 2022. Compiled by authors.

A regional perspective of the number of cases and deaths recorded so far is presented in Table 1.2 and shows the disparities between regions (and countries) as the pandemic spread over the past two years. It also highlights the countries with the highest reported mortality in each of the world regions.

DISRUPTION ACROSS GEOGRAPHIES AND TRANSPORT MODES

The introductory section establishes the context for this volume. In commissioning the chapters which form the basis of this volume, we were motivated by wanting the content to make a difference in transport planning worldwide. We did not want to provide solely for the academic community but to consolidate lessons for practitioners from good and not so good practices of governments and different countries in their response to the coronavirus pandemic. Our motivation, therefore, stemmed from wanting to use the experience of COVID-19 to inform issues of resilience and other policies that could be considered as translational guidelines for the future.

This introductory section (Part 1) brings together a further two chapters which explore the impact of the COVID-19 pandemic in specific ways. In Chapter 2, Hossein Zare, Benjo Delarmente and Darrell J. Gaskin describe how the geographical spread and the speed of transmission of the virus, as captured by cases and deaths, are linked to transport policies and proximity to airports and the level of activity at those airports. Zare et al. provide an in-depth analysis of how the impact of the pandemic varies by demographic groups and regions. The policy implications are stark, suggesting as they do that at least one outcome of

transport policy put in place during the pandemic, in relation to international airports, may have increased the incidence of the virus in its environs. A lesson for the future is that public health and transport policy makers need better cooperation and coordination. In Chapter 3, Kay W. Axhausen, in contrast, considers the ongoing dilemma of transport policy in the context of the impact of the COVID-19 pandemic. The ongoing dilemma of transport policy is how you 'square' the effects of the benefits of increasing accessibility through a reduction in the generalised cost of travel against the increased costs of the negative externalities which are not priced in the system and thus, are excluded from the decision process of the traveller. Whilst the dilemma is long standing, the pandemic has concentrated the issues, which this chapter brings together, in the form of a number of possible futures (automated, managed or car-reduced) together with a commentary as to how transport policy – and the incidence of the pandemic which has provided more evidence – might find new solutions to the climate challenges of today and tomorrow.

The motivation for Part 2 is to provide an understanding of how travel behaviour changed (or did not change) in different geographic settings around the world. These chapters therefore establish and synthesise the travel behaviour impact of the pandemic and set the scene for looking at initiatives and policies implemented in different countries as the pandemic progressed, discussed in more detail in the chapters of Part 3. Four broad geographical settings are considered: North America, Europe, Latin America and the Caribbean, Oceania and East Asia. The final chapter of the section considers logistics and supply chain issues around the world.

The impact of the pandemic on public transport was universally felt through a sharp decline in public transport usage and a substantial amount of emergency funding to keep public transport running. In Chapter 4, Matthew Palm identifies that the sharp decline was against a background of falling patronage in both the USA and to a lesser extent in Canada. In general, the collapse of patronage following the onset of COVID-19 in the USA and Canada could be described as the collapse of the choice traveller market, as the collapse was less strong in those demographics which relied on public transport. This is a theme also identified in the European market where a range of measures was introduced in the different European countries. In Chapter 5, Veronique Van Acker shows how the drop in patronage appeared to be linked to the severity of lockdown measures. However, this effect was not felt everywhere with significant regional variations, as also shown earlier by Matthew Palm, between demographic groups. Much of the decline could be accounted for by a reduction in commuting trips but also leisure trips declined because of lockdown measures: this left primarily essential travellers on the public transport network. Daniel Oviedo, Luis A. Guzman, Julian Arellana, Orlando Sabogal-Cardona, Carlos Moncada and Lynn Scholl focus on Latin America and the Caribbean where COVID-19 was somewhat later in arriving (Chapter 6). Their chapter emphasises a stark picture of widening inequality in urban mobility as a result of lockdowns impinging more on vulnerable households – again the captured public transport user – who has no choice but to travel as working from home is not an option.