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Editorial

Introduction to the Special Issue "Life in the Time of a Pandemic: Social, Economic, Health and Environmental Impacts of COVID-19—Systems Approach Study"

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The preambles in many of the articles in this Special Issue have highlighted how COVID-19 has affected, and is continuing to affect, the way that individuals, groups, organisations and countries operate. The health implications of COVID-19 have seen decision makers take drastic interventions to address the threat to health associated with this disease. However, this has had cascading effects on other aspects of society and the environment. As expressed in the information provided for this Special Issue, "Life in the Time of a Pandemic: Social, Economic, Health and Environmental Impacts of COVID-19—Systems Approach Study", the role of governments around the world has been aimed at containing and reducing the socioeconomic impacts of COVID-19; however, their respective responses have not been consistent. Some 18 months after our call for papers, COVID-19 continues to challenge how governments and individuals manage this pandemic.

The resulting Special Issue from our call comprises nine research papers. These nine papers reflect a good diversity of foci and methodologies, ranging from conceptual/qualitative papers that provide exploration of networks to data-driven models that take advantage of the proliferation of data that have been created during the pandemic, through to fully parameterised deterministic density-based and agent-based process modelling.

In this Special Issue, the first article, by Sahin et al. [1], provides the broad context for the complexity of the COVID-19 pandemic, highlighting the multifaceted, and intrinsically intertwined characteristics of this 'system'. This communication paper produced a preliminary causal loop diagram (CLD) that endeavoured to map out this wicked complexity and advocated the need for considering 'deep leverage' (interventions) points as part of the management plans. CLDs are a commonly used technique in systems thinking, providing an illustrative map of network causality for a system. The second article, by Strelkovskii and Rovenskaya [2], thus provides a timely critique of CLDs that have been developed for COVID-19, including that developed by Sahin et al. [1], producing a set of good practices for creating and presenting these causal maps.

Unsurprisingly, disease models using the ubiquitous susceptible–infected–recovered (SIR) or susceptible–exposed–infected–recovered (SEIR) frameworks are featured in two papers (Bärwolff [3]; Brereton and Pedercini [4]). Such density-based dynamic models enable the evolving nature of 'what if' health-management scenarios to be tested over a period of time from the safety of a numerical playground. Specifically, it has been used in these two papers to assess the effectiveness of 'lockdowns' against indicators such as infection rates, as explored by these two papers.

Several papers drew upon the large number of data that have been produced throughout the COVID-19 pandemic to undertake data-driven analysis. For example, Bertone et al. [5] parameterised Naïve Bayesian networks with such data in their analysis of the impact of lockdown timing on case and mortality numbers. Whilst these data have proven to be a

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goldmine when it comes to creating data-driven (and process-based) models, as highlighted in many of the articles in this issue, it has also created a 'proliferation of multiple views' as investigated by Stella. In this paper, Stella [6] used an analysis of media responding to the WHO declaration of the global pandemic and semantic frame theory with emotional profiling to reconstruct the 'plurality of views and emotions' elicited from this declaration. This showed that this declaration elicited a wide spectrum of perceptions, including anger and grief, but also trust.

From a business perspective, COVID-19 has severely restricted mobilisation, which has disrupted traditional businesses operations. However, it is recognised that this has also created opportunities within the digital landscape. For example, the article by Sorooshian [7] focused on 'change readiness' for the digitisation of tourism. A key finding was that business tourism and event tourism were the most ready for this to occur. The article by Sindhu and Mor [8] highlighted how COVID-19 had facilitated an increase dependence of consumers using digital platforms and identified the importance of measurement and evaluation strategies, and customer as co-creators, as enabling factors for branded content.

The final paper (Harré et al. [9]) presented a comprehensive use of agent-based modelling to evaluate a variety of different mechanisms through which crises can propagate from the micro-economic behaviour through to an economy's aggregate dynamics. This includes an exploration of the impacts of the government's COVID-19 policy on Australia's housing market.

Due to the timing of this Special Issue, much of the focus of these nine papers has been on the dynamics of COVID-19 during 2020 and early–mid 2021. As we enter 2022, vaccination programs are well established in many countries (particularly the 'Global North') and the narrative of 'opening up' and 'living with COVID' is becoming an increasing catchcry. However, COVID-19 is still globally pervasive with reported infection rates higher now than they were during 2020–2021, and decision makers continue to grapple with balancing health and economics.

Conflicts of Interest: The authors declare no conflict of interest.

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