



## Early lessons from COVID-19: An overview

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The SARS-COV-2 coronavirus now globally known as COVID-19 has generated a multi-faceted response since it was recognized by the World Health Organization as a pandemic in January 2020. Governments have tried a wide variety of policy interventions to slow the spread, a wide spectrum of scientists generated an average of 367 journal articles published per week on the medical dimensions of the pandemic with a remarkable short median time of 6 days from submission to acceptance (Palayew et al. 2020), web archives were established to collect all relevant publications when the pandemic was still incipient (Spinney 2020), and viable vaccines were designed, tested, approved, and deployed at an unprecedented rate. Despite such actions, the pandemic continued to spread globally and by early February 2021, over 105 million people had been infected and over 2.25 million had died. As the new year began, infections and mortality have continued to rise. While a range of vaccines may bring some relief in certain countries, even such cautious optimism is tempered by concerns about the emergence of more virulent strains in diverse locations. Meanwhile, some scientists became concerned that the pandemic had so dominated research and publication that they coined a new term to describe the syndrome: “covidization” (Adam 2020).

As its subtitle implies, *Ambio* has focused on the social and environmental impacts of the pandemic, and how society can best adapt to future conditions. The collection of five articles in this special section called “The world after COVID-19: Early lessons” covers several perspectives that need wider exposure, offers some new approaches that could have global relevance, and provides a useful introduction to the relevant literature for those who are seeking to explore policy options about how to build back better from a remarkably disruptive global pandemic. The key is to develop public, private sector, and

governmental capacity to adapt to the changing conditions (especially sudden shocks like COVID-19), to facilitate a long-term global transformation that will make complex, interlinked socio-economic and ecological systems become more sustainable—as explored in another recent paper (Munasinghe 2020).

Pursuing this same vein, the opening paper on Nature and COVID-19 (McNeely 2021), provides an introduction to the environmental dimensions of the pandemic, starting with how it is linked to the major environmental issues that are already affecting the twenty-first century—namely the emergence of infectious diseases, the accelerating loss of biological diversity, climate change, and environmental degradation more broadly. It links these to economic issues of resource consumption and trade at local, national, and international levels to show how the spread of the pandemic is inextricably linked to its environmental dimensions, both drawing from these drivers and contributing to them. Having provided this setting of problems, the paper then shows that “build back better” is a viable option and one that should indeed be pursued so that the current generation of humanity can begin a new flowering of human society based on 10 policy proposals meant to be inspirational and to help stimulate a greening of human society.

In the first national perspective, Sanderson Bellamy et al. (2021) examine how sustainable and just food production and delivery systems can be part of an adaptive response to COVID-19, drawing on experience from Wales and suggesting ways that the evolving approach can be relevant more widely. They start by indicating that the pandemic has illuminated some systemic food-related injustices that have led to serious food insecurity among vulnerable people in Wales, due to social isolation, lack of food in shops, and loss of employment. They call for a

people-centered approach to provide more equitable access to participation in the food system, from growing to distribution and all the steps in between. Community growing projects, mutual aid groups linked through the internet, collective distribution networks, and employment in horticulture are delivering healthier diets with lower negative environmental impacts. They provide a convincing case for a national food framework that would promote people-centered approaches to growing, processing, distributing, marketing, and consuming healthy food produced sustainably. And if such transformative justice approaches had been installed before the pandemic arrived, the response would have been far easier.

In Africa, the problems are even more complex. The paper by Chiwona-Karlton et al. (2021) draws on data from 12 African countries where much of the population is directly dependent on agriculture, and COVID-19 has made food security a major issue that has health, economic, and human rights dimensions. Using data analytics, they examine the likely impacts of the policy measures that are being put into place to address the spread of the pandemic and recovery from it. Regulatory responses such as lockdowns and mobility restrictions may have limited the spread of the virus but at the cost of disrupting food supply chains, exacerbating malnutrition, and severely reducing the flow of overseas remittances that are an essential part of rural livelihoods. They show how feminist economics approaches can provide a solid basis for enabling the reliability, stability, and consistency of food availability, access, and utilization. They call for a new approach to measuring economic phenomena such as unpaid work, the value of the informal rural economy, and social collective drivers. They conclude that the issue of food security needs to be included explicitly in the new Sustainable Development Goals that are expected to follow the defeat of COVID-19.

Maree-Cawthorn et al. (2021) further examine some of the policy challenges posed by the COVID-19 pandemic that affect the future of sustainability. Travel bans, wildlife trade restrictions, mask-wearing requirements, forced closure of enterprises, and so forth were considered by many to be an impingement of human rights or, even worse, ineffective in addressing the pandemic. At a time when international cooperation is especially important, many governments are enforcing travel bans that are affecting both tourism and transboundary trade. When national solidarity is essential, some people question why they need to wear a mask and avoid crowds in bars, restaurants, and entertainment venues. When environmental issues are important parts of the pandemic, why are protected areas being closed to visitors? Focus on the wildlife reservoir of the coronavirus as the ultimate source and wildlife trade as a major issue may be myopic because the issue of where

the pandemic originated is only the opening act in the complex issues surrounding COVID-19. Environmental mismanagement provides the pathways to deliver the novel coronavirus to humans and global trade sends it around the world, and this paper describes the processes in detail and suggests appropriate ways for building frameworks to adapt to future threats posed by emerging infectious diseases. The paper explores ways that local communities and even individuals can be part of a comprehensive approach to adaptive management to the complex problems posed by COVID-19.

To conclude this series of papers, Wu (2021) has provided a review of the socio-economic and environmental drivers of the pandemic, drawing especially from the experience of China to recommend that the risks of pandemics be incorporated into the national and global sustainable development agendas. He sees the emergence of COVID-19 as just the latest in a long line of emerging infectious diseases (EID) and is unlikely to be the last because the fundamental conditions that enable these outbreaks—socioeconomic and environmental factors such as faunal diversity and abundance, climatic conditions, livestock production systems, human population density and distribution, and networks of travel and trade—are eternal parts of the human condition and are well characterized by evolving current conditions in China. The key is building the human capacity to adapt to changing conditions, using social and economic tools to improve institutional coordination to promote local, national, and international investment and cooperation. At China's national level, early reactions included controls in the wildlife trade, improved management of protected areas to build an epidemiological separation between wild and domestic species, limits to domestic travel and trade, and a series of other biosecurity measures that could help inform international initiatives designed to mitigate the socioeconomic and environmental drivers of the EIDs that seem certain to come.

To conclude, we hope that the preliminary ideas in this collection of articles will help stimulate further research and innovation, and develop new directions to make our planet more sustainable for future generations.

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