

Post-Pandemic Urbanism: Criteria for a New Normal

Michael Neuman ^{1,*}, Lorenzo Chelleri ^{2,3,*} and Thorsten Schuetze ^{4,*} ¹ School of Architecture and Cities, University of Westminster, London NW1 5LS, UK² School of Architecture, Universitat Internacional de Catalunya UIC Barcelona, 08017 Barcelona, Spain³ Barcelona Institute of Technology, BIST Barcelona, 08017 Barcelona, Spain⁴ Department of Architecture, Sungkyunkwan University, Suwon 16419, Korea

* Correspondence: m.neuman@westminster.ac.uk (M.N.); Lchelleri@uic.es (L.C.); t.schuetze@skku.edu (T.S.)

Abstract: Globalization, tourism, virtuality, climate change, and the explosive growth of cities have generated a wide range of stressors, pollutants, and toxins that have been ravaging populations. This, coupled with viral, bacterial, and other pandemics, is rapidly creating a new reality that requires public health factors to be integrated more thoroughly into the planning and design of city regions. This prompts a questioning of the role and form of city centers as well as the distribution of people and activities in city regions. This goes beyond more outdoor spaces, places, and activities and new criteria for indoor events. Moreover, public transport, mobility, and infrastructure in general need to be retooled to deal with these emergent circumstances.

Keywords: pandemic urbanism; COVID-19; new normal; urban resilience; pandemic resilience; urban sustainability; healthy cities



Citation: Neuman, M.; Chelleri, L.; Schuetze, T. Post-Pandemic Urbanism: Criteria for a New Normal. *Sustainability* **2021**, *13*, 10600. <https://doi.org/10.3390/su131910600>

Academic Editor: Marc A. Rosen

Received: 18 July 2021

Accepted: 13 September 2021

Published: 24 September 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. What Is Normal?

The new normal is that there is no normal anymore. Since the disruption of our normal lives during the pandemic we have no certainty regarding how and where we will live and work in the future. During the pandemic, we were forced to embrace changes in our daily routines, in the way we live. For the first time in centuries, since at least the Industrial Revolution, if not millennia in some cultures and places, humans have had to live like all the other species on the planet have always had to live since the beginning of evolution on Earth. That is, living day to day, with uncertainty, not being able to plan for the future, and not being able to rely on our customary methods and traditions of living.

Examples of this include the countless wildfires raging across the globe, a seeming pandemic of its own, with each season setting national records. In many forests, whether fire climax, fire-tolerant, or fire-adapted ecosystems, fire is routine and necessary for their health. Yet forest fires threaten buildings and lives because urban expansion increasingly encroaches into “natural” areas and thus into harm’s way [1]. The normalized expansion into the “urban-wildland interface”, plus a century of wildfire suppression that has led to a massive increase in the fuel load, along with more severe and frequent draughts, winds, and heat waves due to climate change, have worked together to increase the number, size, and damage of wildfires [2].

Although there are other natural disasters we can add to this list, fire’s relationship with COVID-19 is important because smoke inhalation weakens the lungs and the immune system. It thus makes individuals living in smoky areas more susceptible to infection by COVID-19 and other viral vectors. This illustrates the interactions among human activity, climate change, and pandemics that must be considered in any urbanism. Moreover, it creates fire refugees from rural areas, where vaccination rates are lower, into urban ones, thus further fueling the COVID-19 pandemic [3].

The smoke from wildfires affects cities located in wildfire regions. In general, air pollution results in increased vulnerability against COVID-19 and in diseases and infections that kill approximately seven million people every year [4]. Ultrafine particles (UFPs)

resulting from combustion engines in road vehicles are the primary source of UFP emissions and air pollution in urban areas. However, more harmful than the direct human health impact from UFPs may be the indirect health effects through global climate change caused by UFPs' influences on meteorological and hydrological processes [5].

The COVID-19 pandemic threatens our economies and our urban way of life in multiple and fundamental ways. In the past, the norm was to plan, design, and manage cities through institutional command and control mechanisms governing complex ecological-cultural systems *in which order was based on predictability*. The future augured hope. Prospects seemed more certain. Now the future is uncertain [6]. Although told to be resilient and to adapt, we live in "stand-by", awaiting a return to our prior lives. As this readership knows all too well, humanity's current modes of urban living, and of building cities, were not sustainable, and are becoming less so [7]. Will a "new normal" also mean a new resilience? A new adaptation?

In order to understand and begin to answer these questions, let us examine phrases common in language today, because they reveal so much about how we are handling and living with the COVID-19 pandemic. One phrase is "the new normal". Another is "back to normal", the way things were before the pandemic. The following question arises: Is recovery, the new normal, fundamentally different, a new way of living and being in the city? Or is it going back to the (unsustainable yet known and therefore predictable and reassuring) way things were, slightly modified? The pandemic has shown that resilience is central to sustainable adaptation. What is the new form of this resilience in city regions and the hybrid regions where urban development and "nature" are mixed [8]? How does it change the way we live and work in them, as well as plan and manage them [9]? These are the questions we seek to answer through the contributions to this special issue.

2. Culture and Its Role in Adaptation and Transformation

To do justice to those phrases, we first have to look at the word "normal". "Normal" refers to what humans consider the routine, the expected, where the past continues into the present. This expectation comes from culture, where humans create, live in, and live by traditions and institutions. These institutions and traditions have norms embedded in them. Norms are uniquely human. Culture, which is based on norms and propagates them—the original meaning of memes—includes language, cuisine, agriculture, human settlements, tools, music, art, and learning that is rational and passed through rational rather than evolutionary means, as it is in other species.

Other species must be attuned to their environment, take their cues from it, and live by adapting to the patterns and rhythms of nature for survival and reproduction. This type of resilience is in their DNA. On the contrary, we have largely divorced ourselves from the land, from the sea, and from the patterns and rhythms of nature, relying on technology and our cultural and economic strategies instead. This is increasingly to our peril, especially as the digitally enabled virtual world overtakes the "real world". Is it possible that humankind's greatest achievement, and surest adaptive strategy—culture, and all it entails—is leading us to our downfall?

In fact, throughout human history, culture has been humanity's most effective adaptive/evolutionary strategy. It has given us the means to inhabit every corner of the globe, and dominate every part of the globe [10,11]. Yet is it not ironic that our adaptive mechanism of culture is failing us as a species? This is because we have, as a planet-wide species, caused ecological overshoot since about 1970 [12]. The year 1970 was the moment when humans, because we were increasingly city dwellers, began to consume more and waste/pollute more than the earth's natural ecosystems, along with the oceans and atmosphere, could support. Perhaps we are the first species whose adaptive strategies work against the survival of our species and many others. That is, in many instances, culture has led to maladaptation [13] and non-sustainable ways of life.

In nature, the amount of locally available resources determines population growth. In the case of abundant resources, populations tend to grow, followed by a population

collapse after overexploitation of resources required for survival. For example, rodents have population cycles of rapid growth, followed by sharp decreases [14,15]. In contrast to animals, humans are aware of overexploiting the carrying capacity of our global habitat. Still, humanity did not manage to transform the destructive global system of production and consumption into a sustainable system that facilitates the restoration of global ecosystems [16].

Some long-standing urban routines are positive vis-à-vis sustainability and resilience, such as going out of our homes to socialize (enhancing trust, support networks, and mutual learning, for example). However, others are less so, such as cruise-ship holidays, adapting to hot summer weather using air conditioning, the self-imposed need to fulfil “bucket lists” and other unsustainable modes of consumption. Although other examples on both sides of the equation could be named, the “normal routines” of the past need to be re-evaluated in the post-pandemic world against urgent criteria of sustainability, climate resilience, and degree to which they contribute to the emergence and propagation of new pandemic-inducing viral vectors.

In this way, urban culture has become a double-edged sword. On the one hand, civilizations have given us an amazing array of artefacts and ways of living that enrich our lives, places, communities, and humankind. On the other hand, it has led to unsustainable profligacy, as well as glaring and increasing social and economic inequities of all kinds. Moreover, it has led to a redefinition of urban resilience in terms of the human species, including resistance to illness. Before the twentieth century, or the Industrial Revolution, perhaps, human resilience, including our immune responses, were uniquely and well adapted to our local environs. These environs of small, localized settlements in which we lived extended perhaps not more than several days’ walk or ride in radius. Our gut biomes, our immune systems, and other adaptive mechanisms were finely attuned to the local environment. Most of the exposure was to nature and its natural products and comestibles with which humanity co-evolved.

Globalization, tourism, virtual realities, and the explosive growth of population and cities has put an end to all that. One telling indicator of the imbalance is the rates of human evolutionary resilience and the exponential increases in synthetic chemicals since 1900 to which our physiologies have yet to adapt: Expected longevity in the US and the UK had been declining since 2016, before the COVID-19 pandemic [17,18]. The pandemic has accelerated this decline [19]. A wide range of environmental stressors, pollutants, and toxins have been ravaging populations, and not just human populations. These and climate change are causing massive human migrations, projected to reach over one billion climate refugees by 2050 [20]. Our immune responses were being severely tested before this pandemic [21,22]. These stressors and their effects are largely urban in origin.

Thinking of climate refugees may bring to mind Pacific Islanders and other island and coastal nations, whose low-lying lands are being submerged below the sea. Some will lose their entire nations to the sea in a few decades. This is compounded in places like coastal Bangladesh, where not only increased flooding, but also inundations of Rohingya refugees from Myanmar and Hmong refugees from several Southeast Asian nations number in the millions, or those fleeing South Sudan or any number of African nations to escape war and civil strife induced by draught and famine. However, climate refugees in advanced nations rarely come to mind. Yet in the wildfire-stricken American West, or the hurricane-stricken Gulf Coast of the U.S., tens to hundreds of thousands of people flee every year, many of whom are permanently displaced. This has led to rethinking resilience so that programs are more sustainable by addressing prevention. According to a recent report, “Almost all of the current federal programs are triggered by disaster, and . . . the idea of having federal intervention here triggered by disaster needs to be totally flipped on its head. Federal interventions need to be triggered by the idea that we know that certain areas are risky and that there’s a federal interest in buying down that risk . . . before a disaster” [23].

As was aptly stated by the Secretary General of the United Nations, referring to the 2021 IPCC report, we have “nowhere to run”, nowhere to hide. This type of thinking, of

standing existing narratives and approaches on their heads, also applies to the COVID-19 pandemic and urbanism. This can clearly be seen in infrastructure.

Thus, solutions for improving livability, sustainability, and resilience must address these urban and global influences. One of the main questions is the following: How can we introduce integrated sustainable ecosystem approaches in our segregated urban systems to achieve such improvement goals? The challenges are simultaneously ecological, social, and economic in nature and therefore can only be addressed effectively by integrated processes and technologies.

3. Infrastructure, Pandemics, and Sustainable Urbanism

Infrastructure provides the basis for all aspects of a pandemic and its urbanism. For COVID-19, this includes knowledge and dissemination institutions like universities, national health research, vaccine and drug testing and approval bodies, funding entities, pharmaceutical companies, the media, and the technologies (infrastructure) that support them. The same is true for treatment, including hospitals and clinics, health care systems, and government health agencies, and all the infrastructures that support them.

This also applies to the roles that urbanism plays in adapting cities so that residents and employees can continue to live and work while limiting exposure to the virus. Numerous approaches have been tried throughout the globe. They include enhancing access to active travel modes as public transit usage plummets; enhancing access to and quality of public outdoor spaces for gathering and activities while social distancing; reconfiguring streets and sidewalks so that cafes, pubs, bars, restaurants, and similar customer service-oriented businesses can operate; and working from home or an alternative residential location. All these require adaptations to current modes of designing and planning cities.

In sum, infrastructure is vital to both minimizing or preventing exposure to contagious viruses—so they permit changes to human behavior during pandemics—and to testing, medical treatments, and vaccination. This entails a change in thinking and acting for those dealing with infrastructure, whether politicians, financiers, planners, designers, engineers, or public health care professionals.

4. Criteria for a New Normal: Transforming Patterns of (Re)Development

According to Devi Lockwood, “There is no normal” [24]. She goes on to ask, “What does it mean for a whole nation to become uninhabitable?” This question is triggered by the multiple crises affecting so many nations now, including the wealthiest, as they struggle to adapt to accelerating climate change, increasing wildfires, addiction, poverty, epidemics and pandemics, housing and costs of living, social and economic inequalities, and so on.

Is the “emerging normal” arising from our responses to the COVID-19 pandemic resilient but unsustainable? Or is it a “game changer”, changing our system and lives through resilience toward sustainability? Some early evidence suggests that cities have been responding by adapting their streets and public spaces, both to accommodate social distancing and to allow for critical outdoor access during lockdowns [25,26]. Other cities have been rethinking urban space to be even more local and sustainable, such as “transit-oriented development” and the “15-minute city”. There has been much experimentation in ways to provide services to underserved populations, to engage more people in resilient and sustainable ways of living, and to accelerate circular urban economies, to name just a few initiatives.

The new urban landscape post-pandemic needs to respond to the ability to work remotely from almost anywhere by radical changes to spatial planning that in the past created single land-use zones isolated from others. Although some businesses will return to in-person operations, others will remain largely remote/virtual, and still others a hybrid. What does this distribution across regions mean for (often centralized) infrastructures, especially for transport, energy, and water?

How do transformations in infrastructures, living, and working effect the utilization of urban and rural spaces and local economies? How will different development

and redevelopment scenarios affect the achievement of the 2030 Agenda for Sustainable Development Goals?

Apart from cities, small towns far from urban centers are growing rapidly in many places. Their newcomers seek lower prices, less traffic and stress, fewer pandemic-related restrictions, and proximity to nature. Although these trends are evolving rapidly, particularly where vaccinations are widespread, if lasting, they could exert a game-changing effect on urban transformations on the one hand, while simultaneously pushing for a quick return back to “normal”. It further would lead to changes in urban planning and design principles and criteria, where decentralized settlements are robustly interconnected with infrastructures that are distributed, decentralized, mobile, small scale, open, and flexible—in a nutshell, more resilient [27].

National governments and professional associations have released reports on how the pandemic is affecting daily life, and how places and professions should respond. The United Nations issued a comprehensive report detailing how the population size, density, and urban form of cities plays an outsized influence on the establishment, spread, and containment of pandemics [28]. The report goes on to say that city regions and their infrastructure need to be much more integrated to combat future pandemics, which are sure to come with more frequency and severity [29,30]. This UN report can inform new criteria for pandemic urbanism.

Thus, it is appropriate to reflect on city-region planning. This recasts the interesting and perennial debate on planning, density [31], and the role of city centers. Will the new regional and rural distributions of people, driven by this (and future) pandemics, be supported by a post-pandemic urbanism based on distributed and networked infrastructure? Will this be an opportunity for empowerment and increasing self-sufficiency? Or will we revert to the old patterns of (electric) car-based urban sprawl, which is highly unsustainable because of the land consumption and unhealthy living routines? Is there any “new” balance of design and density within the new normal to accelerate the transition toward more livable, resilient, and sustainable places?

5. Conclusions

Is this merely human nature and culture, where the good always comes with the bad? Is there another way? Certainly, experimentation is key [32]. If the lockdowns associated with this pandemic have taught us anything, it is “that it is possible to suspend assumptions and habits—indeed an entire economic system and its implicit judgements about social worth and environmental value. The challenge now is to hold on to the things we’ve learnt, and to understand that new ways of doing things are not only possible, but critical to addressing the crises we have inflicted on ourselves and our conditions of existence. If we can do it for COVID-19, we can do it for a far greater existential threat. The climate emergency behooves us to modify our practices with boundless imagination, experimentation and research” [33].

In the end, perception and framing these issues matter. Do we perceive pandemics as threats, or as opportunities for adaptations by systemic transformation? Risk leads to reactions, which primarily aim to protect ourselves. Behind “back to normal” lurks the fear of change. Yet what if the risk is threatening not only our jobs, families, friends, and colleagues but also our global support system? Only when our livelihood, daily routines, and health are jeopardized do we act swiftly and decisively. This is how the quest toward a coordinated urgent transformation begins—via pandemic urbanism.

Author Contributions: Conceptualization, L.C., M.N.; writing—original draft preparation, M.N.; writing—review and editing, M.N., L.C., T.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

References

- Thode, E.; van Wagtenonk, J.; Fites-Kaufman, J.; Shaffer, K.; Sugihara, N.; Stephens, S. (Eds.) *Fire in California's Ecosystems*; University of California Press: Berkeley, CA, USA, 2018.
- Bento-Gonçalves, A.; Vieira, A. Wildfires in the wildland-urban interface: Key concepts and evaluation methodologies. *Sci. Total Environ.* **2020**, *707*, 135592. [[CrossRef](#)]
- Khubchandani, J.; Sharma, S.; Price, J.H.; Wiblehauser, M.; Sharma, M.; Webb, F.J. COVID-19 Vaccination Hesitancy in the United States: A Rapid National Assessment. *J. Community Health* **2021**, *46*, 270–277. [[CrossRef](#)]
- United Nations Environment Program, All You Need to Know about Air Pollution. Available online: <https://www.unep.org/interactive/all-you-need-to-know-air-pollution/> (accessed on 27 August 2021).
- Kwon, H.S.; Ryu, M.H.; Carlsten, C. Ultrafine particles: Unique physicochemical properties relevant to health and disease. *Exp. Mol. Med.* **2020**, *52*, 318–328. [[CrossRef](#)] [[PubMed](#)]
- Di Giovanni, A. Epidemia, città e territori. *Planum* **2020**, *41*, 1.
- IPCC. *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*; Masson-Delmotte, V.P., Zhai, A., Pirani, S.L., Connors, C., Péan, S., Berger, N., Caud, Y., Chen, L., Goldfarb, M.I., Gomis, M., et al., Eds.; Cambridge University Press: Cambridge, UK, 2021; in press.
- Alberti, M. *Cities that Think Like Planets: Complexity, Resilience, and Innovation in Hybrid Ecosystems*; University of Washington Press: Seattle, WA, USA, 2016.
- Dudney, J.; Hobbs, R.J.; Heilmayr, R.; Battles, J.J.; Suding, K.N. Navigating Novelty and Risk in Resilience Management. *Trends Ecol. Evol.* **2018**, *33*, 11. [[CrossRef](#)] [[PubMed](#)]
- Vitousek, P.M.; Mooney, H.A.; Lubchenco, J.; Melillo, J. Human domination of earth's ecosystems. *Science* **1997**, *277*, 494–499. [[CrossRef](#)]
- Chapin, F.S., III; Walker, B.H.; Hobbs, R.J.; Jooper, D.U.; Lawton, J.H.; Sala, O.E.; Tilman, D. Biotic control over the functioning of ecosystems. *Science* **1997**, *277*, 500–504. [[CrossRef](#)]
- World Wildlife Fund. *Living Planet Report 2020*; Almond, R., Grooten, M., Petersen, T., Eds.; WWF: Gland, Switzerland, 2020.
- Barnett, J.; O'Neill, S. Maladaptation. *Glob. Environ. Change* **2010**, *20*, 211–213. [[CrossRef](#)]
- Kausrud, K.L.; Mysterud, A.; Steen, H.; Vik, J.O.; Østbye, E.; Cazelles, B.; Framstad, E.; Eikeset, A.M.; Mysterud, I.; Solhøy, T.; et al. Linking climate change to lemming cycles. *Nature* **2008**, *456*, 93–97. [[CrossRef](#)]
- Oli, M. Population cycles in voles and lemmings: State of the science and future directions. *Mammal Rev.* **2019**, *49*, 226–239. [[CrossRef](#)]
- United Nations. *Transforming our World: The 2030 Agenda for Sustainable Development*; United Nations: New York, NY, USA, 2015.
- Wolf, S.; Schoomaker, H. Life expectancy and mortality rates in the United States, 1959–2017. *JAMA* **2019**, *322*, 1996–2016. [[CrossRef](#)] [[PubMed](#)]
- The Lancet Commission on Pollution and Health. Lancet Commission on Pollution and Health. *Lancet* **2018**, *391*, 462–512. [[CrossRef](#)]
- Aburto, J.; Kashyap, R.; Schöley, J.; Angus, C.; Ermisch, J.; Mills, M.C.; Dowd, J.B. Estimating the burden of the COVID-19 pandemic on mortality, life expectancy and lifespan inequality in England and Wales: A population-level analysis. *J. Epidemiol. Community Health* **2021**, *75*, 735–740. [[CrossRef](#)] [[PubMed](#)]
- Institute for Economics & Peace. *Ecological Threat Register 2020: Understanding Ecological Threats, Resilience and Peace*; Institute for Economics & Peace: Sydney, Australia, 2020.
- Smith, K.; Goldberg, M.; Rosenthal, S.; Carlson, L.; Chen, J.; Chen, C.; Ramachandran, S. Global rise in human infectious disease outbreaks. *Interface J. R. Soc.* **2014**, *11*, 20140950. [[CrossRef](#)] [[PubMed](#)]
- Zimmer, C. *A Planet of Viruses*, 3rd ed.; University of Chicago Press: Chicago, IL, USA, 2021.
- Martin, C.; Williams, A. *A Federal Policy and Climate Migration Briefing for Federal Officials and Legislative Officials*; The Urban Institute: Washington, DC, USA, 2021.
- Lockwood, D. What does it mean for a whole nation to become uninhabitable? *New York Times*, 13 August 2021.
- Ajuntament de Barcelona, Barcelona Superblock: New Stage. 2021. Available online: <https://ajuntament.barcelona.cat/superilles/en/> (accessed on 15 August 2021).
- Filion, P.; Doucet, B.; van Melik, R. (Eds.) *Global Reflections on COVID-19 and Urban Inequalities*; Policy Press: Bristol, UK, 2021; Volumes 1–4.
- Neuman, M. Infrastructure is Key to Make Cities Sustainable. *Sustainability* **2020**, *12*, 8308. [[CrossRef](#)]
- United Nations Human Settlements Programme (UN-Habitat). *Cities and Pandemics: Towards a More Just, Green and Healthy Future*; UN-Habitat: Nairobi, Kenya, 2021.
- Neuman, M.; Hull, A. (Eds.) *The Futures of the City Region*; Routledge: London, UK, 2011.
- Neuman, M.; Zonneveld, W. (Eds.) *The Routledge Handbook of Regional Design*; Routledge: New York, NY, USA, 2021.
- Hamidi, S.; Sabouri, S.; Ewing, R. Does Density Aggravate the COVID-19 Pandemic? *J. Am. Plan. Assoc.* **2020**, *86*, 495–509. [[CrossRef](#)]
- Acuto, M. COVID-19: Lessons for an urban(izing) world. *Cell One Earth* **2020**, *2*, 317–319. [[CrossRef](#)]
- Charrington, H.; (University of Westminster, London, UK). Personal communication, 2020.