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Planning in the Face of Extraordinary Uncertainty: Lessons from the COVID-19 Pandemic

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At the beginning of 2020, the COVID-19 epidemic escalated. While the infection initially appeared to be a distant, regionally contained problem that the European public would have to deal with primarily in the context of news broadcasts (Boin *et al.*, 2021), in February 2020 at the latest, it became clear that this disease represents a truly global problem and thus has to be categorised as a pandemic. Only a few days later, throughout central Europe, the corona pandemic turned into a corona *crisis* (Brinks & Ibert, 2020). Even though experts in virology and epidemiology have been warning of the possibility of pandemic zoonoses for quite some time and there were already corresponding scenarios and risk analyses by government agencies (Global Preparedness Monitoring Board, 2019; in Germany, for instance: Deutscher Bundestag, 2013), warnings and reports did not receive the required political attention. As a consequence, society was hit hard by the coronavirus and revealed to be largely unprepared.

With greater parts of the population having been vaccinated against the virus, the pandemic has turned from an acute crisis to a protracted problem. While there seems to be more time for reflection, the experiences made during the past 1.5 years nevertheless continue to challenge spatial planning, which – as a discipline and practical domain – claims to be significantly involved in shaping the future. One might even state that planning practice and research are still ‘being tested’ (Stark, 2020, p. 67) by the pandemic. In our view, the COVID-19 pandemic is an occasion for normative self-assurance about the accuracy of the discipline’s future expectations. Moreover, it offers an opportunity to practically stress-test the robustness of influential conceptual ideas, such as ‘resilience’ (Elmqvist *et al.*, 2019; Meerow & Newell, 2019) or ‘transformation’ and ‘transition’ (Geels, 2002; Kanda & Kivimaa, 2020), under the conditions of a ‘forced experiment’ (Acuto *et al.*, 2020). As we will argue in the following, the crisis may profoundly change the way we think about sustainability. With a view to the COVID-19 pandemic and other systemic crises, Brand (2020) argues that sustainability can hardly be understood as a predictable, plannable process, and that dealing with crises must become more central to thinking and acting. Moreover, new resilience regimes might emerge alongside the

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postulate of sustainability (Bolleter *et al.*, 2021; Davoudi *et al.*, 2013) and our understanding of resilience shifts from adaptation to adaptability (Grabher & Stark, 1997; Hu & Hassink, 2020).

Of course, the true nature and full extent of the transformative potential of the coronavirus crisis cannot yet be seriously assessed (Kunzmann, 2020). Possible consequences for a post-coronavirus ‘new normal’ are currently hotly discussed in diverse policy fields relevant to spatial planning. These discussions cover topics such as new forms of work and work organisation and the related spatial patterns (such as mobile work), shifting preferences in housing demand, new forms of commuting as well as professional and leisure-related mobility and, last but not least, changes in the demand for social and technical infrastructures, including health services. In light of such discussions, most commentators consider it unlikely that there will be some kind of restitution of formerly ‘normal’ institutions, routines or social practices once the pandemic has been overcome (whatever this means).

In this paper, we do not treat the pandemic as a unique event but rather as a symptomatic incident, a disruption that most likely will re-occur in similar ways in the future. It thus raises more general questions on the effects of external shocks on processes of sociospatial transformation. Against this background, the aim of this paper is to stimulate a discussion on the consequences of the COVID-19 pandemic for the discipline and practice of spatial planning. What principles of action, strategies and measures beyond acute crisis management can spatial planning offer in the face of this disruptive event? How should spatial planning adapt its approaches, methodologies and future expectations in light of the experiences gained through the pandemic? In the following, we formulate some hypotheses from a sociospatial science perspective.

1. The Corona Pandemic Is a Disruptive Event but Is Not Unprecedented

The current pandemic is often given predicates such as ‘unprecedented’ and ‘historically unique’. This takes into account the fact that the spatial and societal scope of the crisis massively affects all parts of society, from education, culture, and retail to global value chains. Historically, COVID-19 is not the first pandemic, of course, and not the most threatening one. Consider, for instance, the frequent reoccurrence of smallpox epidemics throughout history or the ‘Spanish’ flu shortly after the First World War. However, it is the first pandemic whose spread is mediated in real time with and in front of a global audience, and it demands action and well-informed decisions from every single individual.

However, treating the coronavirus as a singularity obscures the possibilities of learning from the pandemic. Other crises have also shaken the world in recent decades, albeit not on such a ubiquitous scale or with such far-reaching individual consequences for the way people live their lives. The terrorist attacks of 9/11 in 2001, the catastrophes of Chernobyl 1986 and Fukushima 2011 or the financial, monetary and economic crisis from 2008 onwards provide additional examples of disruptive events. Although the latter examples are of a completely different nature, they resemble the pandemic with respect to the immediate collective responses they require and the far reaching societal consequences they entail. Against the background of a highly interdependent global economy, a growing reliance on hyper-complex technologies and increasingly precarious ecological

conditions, mankind seems to be forced to expect the unexpected. It is impossible to foresee all details, but most likely the next thing to come will not be a pandemic, yet have disruptive qualities similar to those of the COVID-19 pandemic. From a social scientific perspective, such disruptive events share the following features:

- surprise in the sense of a sudden recognition of a growing problem (Deutsch, 1973) and resulting from a lack of preparedness;
- ‘extraordinary uncertainty’ (Stark, 2020), in the sense of a high degree of contingency, ‘incalculable’ (Knight, 1921) conditions and an undetermined future;
- the ‘collapse’ of meaning and cosmological sense (Weick, 1993);
- the necessity for ‘tactful’ (Kornberger *et al.*, 2019) improvisation; and
- urgency to respond immediately.

When perceiving disruptive events as something ‘nonsingular’, we still acknowledge their qualities of ‘standing out’ from everyday routines. Moreover, our argument is not about expanding the crisis experience to a state of ‘permanent alarm’. Rather, by taking into account the possible, even likely occurrence of disruptive events at any time in the future, we move beyond linear projections of long-term trends and arrive at more robust and more realistic expectations of the future that provide a solid ground for more sovereign and more reflected action and decision-making.

2. Disruptive Events Reveal Complex Patterns of Unequal Societal Vulnerability in Unpredictable Ways

Disruptive events have a wide social and spatial radius of impact. The term ‘pandemic’ was coined precisely for situations in which an infectious agent can no longer be confined locally or regionally but threatens people worldwide. At the same time, the coronavirus pandemic in particular shows that while disruptions threaten broad parts of society, if not everyone, they neither act as a social equaliser nor affect all sub territories equally or in the same manner (Bailey *et al.*, 2020; Kuebart & Stabler, 2020). Globally, a strong differentiation must certainly be made between the Global North and the Global South with their different crisis management resources (Gupte & Mitlin, 2020). Within supra-national regions, such as Europe, and nation states, pronounced sociospatial and territorial differences have been shown in the impact of the pandemic, the stringency and restrictiveness of government containment measures, and the social and economic consequences (Brinks & Ibert, 2020; United Nations, 2020; ESPON, 2020; Davoudi & Ormerod, 2021). More recent research at the urban neighbourhood level shows that in many places, the incidence of infection is disproportionately concentrated in socially deprived neighbourhoods with cramped housing conditions and low-quality public spaces (ONS, 2020). These spatially unequal patterns of affectedness were already evident in earlier epidemic outbreaks, such as tuberculosis, and suggest continuity in sociospatial segregation over several decades (Kistemann, 2021).

From a sectoral perspective, the pandemic affected many different topics: education, health, and the economy. Additionally, within sectors, for instance, economic outcomes differ by industry. Some subsectors, such as the hospitality industry or cultural industries, show harsh signs of crisis (Florida & Seman, 2020), while others, such as the automotive

industry, quickly return to previous levels of growth or even benefit from the crisis, such as Internet companies. The societal capacity to recover from economic damage also varies from region to region, as experiences from the financial crisis illustrate (Sensier *et al.*, 2016).

The pandemic thus raised awareness of the individual vulnerability of every single person. This experience is intensified through inter-sectoral forms of threat (e.g. protections against infections threatened economic incomes or limited access to education); in this respect, it is a democratised threat. However, the longer the pandemic persisted, the more it became clear that socioeconomic and sociospatial inequalities determine to a large degree who is affected by the pandemic, how strong the crisis strikes and what resources are available to protect oneself (Mein, 2020; United Nations, 2020; Davoudi & Ormerod, 2021).

Disruptive events are generally characterised by global outreach. Regardless of whether it is a nuclear disaster, financial crisis or pandemic, highly valued goods, such as the health (up to and including life) of the population and environmental or tangible assets, are threatened. Furthermore, the COVID-19 pandemic teaches that political and social achievements such as constitutional rights or the right to education are all but crisis-proof in the case of a disruption. At the same time, disruptive events reveal that the degree of vulnerability is highly differentiated socially and spatially. However, the concrete patterns of unequal affectedness are not of key importance. Rather, what seems most important as an insight for the future is that some known forms of inequality are likely to persist, while at the same time, new division lines are likely to emerge. It is thus impossible to predict the ways in which inequality will unfold or to know in advance the ultimate patterns of unequal impact caused by future disruptions.

These insights are meaningful for spatial planning. The social construction of vulnerabilities always takes place against the background of widely shared social values (Christmann & Ibert, 2012). Here, the planning sciences, as a normative knowledge domain, have something to offer to other disciplines. A planner's mandate is not only to conduct value-based debates on cohesion, equality, sustainability or economic development in the abstract but also to make such values operational, to balance contradictory normative claims in concrete cases and to come to value-based conclusions in processes of spatial development. The discipline and practice of planning thus has developed robust practices and legally secure ways of balancing contradictory normative claims and might thus be better prepared to deal with the challenge of avoiding biased decision making when responding to a surprising threat.

3. Disruptions Require Smart Approaches to Data and Information

Disruptions shake up our view of the world. Their spatially and socially differentiated effects require rapid and comprehensive spatial analyses of both the triggered sociospatial processes and the underlying causes and (potential) effects. However, these analyses are proving more than difficult due to the inertia of official statistical information systems. The 'measuring' of the COVID-19 pandemic is therefore progressing very slowly. The initial studies started in 2020 based heavily on existing data from public sources are little more than a promising start (Franch-Pardo *et al.*, 2020).

However, the problem of cognition in the case of disruptions reaches deeper and is not exhausted by a lack of data and information alone. It is in the nature of disruptions that existing data are not sufficient to immediately grasp the new situation or that data are available but the categorisation is inappropriate. If one takes the possibility of disruption seriously, it is hardly possible to draw general conclusions about how public statistics and planning-supporting spatial monitoring need to be adapted at various levels. Moreover, once a disruption occurs, there will not be adequate time for tailor-made primary data collection. Rather, skills need to be cultivated to combine existing data sets from multiple sources quickly and effectively, depending on the disruptive event and its dynamics. What is needed is ‘smart’ planning expertise that encompasses analytical skills to source and process secondary data, which is produced constantly in an increasingly digital world, and create linkages across data sets to tackle the problem as it unfolds. The ‘data dashboards’ that have been developed in many countries on short notice are a case in point; during the COVID-19 pandemic, they linked national, regional and local data on the incidence of infection with economic and social data to enable a better understanding of the multiple impacts of the virus in space and the specific regional contextual conditions in each case. Quasi-real-time assessments in the analysis of mobility constraints provide another example of innovative ways of dealing with data in a highly dynamic situation (Batty, 2021).

For long-term strategies of developing further spatial observation data, it is crucial to make the digital core data sets of spatial observations accessible at various levels of recording, ranging from small-scale and supra-regional. This requires a fundamental geocoding of core national registers (e.g. of labour market and social statistics). Moreover, small-scale differentiated data sets below the city level should be made freely accessible. Since the desired data quality (spatial and temporal reference, aggregation) is unlikely to be known *ex ante*, the highest priority must be given to the standardisation of data sets and descriptive metadata. Furthermore, there is the challenge of developing comprehensive impact models that can help researchers better recognise interdependencies and thus determine probabilities for disruptive developments in a wide range of thematic areas. For this, inter- and transdisciplinary cooperation is essential (ARL, 2021).

4. Disruptive Events Open Windows of Opportunity for Transformative Action

Transformation research focuses on the need for fundamental changes in structures and processes. The ambivalent effects of disruptive events are emphasised: they are seen not only as threatening but also as offering valuable opportunities to implement required changes, for instance, to mitigate global warming. Such high hopes were expressed in an early phase of the coronavirus pandemic, which was framed as an opportunity to strengthen the legitimisation basis for conflictual, transformative planning policies and to mobilise resources for action (Barbarossa, 2020; Kanda & Kivimaa, 2020).

The current crisis thus also allows drawing conclusions about how states may deal with future mega challenges, such as those caused by global warming. The pandemic has demonstrated the importance of a well-functioning public infrastructure (not only of health care facilities) and has strengthened confidence in preventive government action.

At the same time, considerable room for political and social manoeuvres in the management of the crisis has become apparent to an extent not previously thought possible. State actors have intervened considerably in the behaviour of individuals and companies (with prohibitions and restrictions) and have mobilised enormous amounts of resources on short notice to compensate those who had to bear the disadvantages of preventive (or reactive) measures (for example, through financial compensation). While structurally effective measures to reduce greenhouse gas emissions are often assumed to require long adjustment phases, the COVID-19 pandemic has demonstrated that fundamental changes in behaviour could be enforced through state intervention in regions and entire nation states within a few days.

However, such high levels of attention and legitimation for state intervention can be kept up for only a limited time. Experiences from other crises, as well as more recent observations of the loosening of policies against the pandemic, show that the window of opportunity closes again quickly. However, what happens in this short time span seems to be decisive.

Corona opens the possibility of critically examining social theoretical assumptions about the possibilities and conditions of transformation. In a recent debate among sociologists, none of the established transition theories, systems theory, structural determinist (neo-) Marxism or transformation and transition theory, are able to fully incorporate the observations made during the pandemic (Rosa, 2020; Dörre, 2020; Markard & Rosenbloom, 2020). For sustainability-oriented spatial planning that seeks to initiate change and transformation 'for the better' and is not naive, a critical revision of basic theoretical assumptions about planning's mandate and framework for action will be of utmost importance in the near future.

5. Disruptive Events Favour the Prepared Mind

When disruptive events mobilise societal transformation forces, crucial questions arise: In which direction do these forces act? Who are the key actors in this process? Do disruptive events accelerate already established trends, or can they also set new impulses for transformations that are desired and considered necessary but have thus far been neglected?

Disruptive events open a window of opportunity for implementing novel solutions, yet the time horizon in which action can be initiated is very short (see above). At the same time, extraordinary uncertainty prevails. In such a situation, there is an enhanced need for research and advice. However, scientific research, because of its accuracy and explorative character, is too slow to provide an immediate response in the event of a disruption. Successful implementations of novelty during the COVID-19 pandemic suggest that it is not so much innovative research that matters but good preparation. For instance, in medical research, new answers could be given in a short time based on available knowledge and resources; the rapid development times of novel mRNA vaccines are a case in point. Likewise, conference software was able to spread explosively only because the respective software solutions were already widely developed. In both these examples, the elements of the respective solutions were already in place or close to

completion when the pandemic broke out. The successful implementation and long-term catalytic effects on transformative developments in disruptive situations seem to depend on well-prepared actors and existing solutions.

These examples from the COVID-19 pandemic show that novel solutions in immediate response to a disruptive event are mainly reached by means of improvisation. In musical improvisation, for example, in jazz, musicians play sequences of music freely and recompose musical patterns spontaneously, although in a clear temporal framework and against the background of a known repertoire of beats, rhythms and melodic patterns. Improvisation artists have acquired the ability to create novelty in a spontaneous interaction with the unfolding situation through careful preparation, appreciation of the rules and skilful mastery of instruments and learned techniques of responsive interaction. Applied to spatial planning this can mean that within an institutional framework, the planning instruments should wisely and knowledgeably design spaces of opportunity for temporary flexibility in combination with new actor constellations and their logics, their rhythms of action. The experiences to be derived from this and their reflection potentially open up innovative approaches for rules and patterns of spatial development.

What can spatial planners learn from the pandemic for future crisis events? From our point of view, planning must develop a culture of strategic improvisation. First, like improvisation artists, planners should invest in preparation. Desired solutions must be developed in ordinary times for them to be available in the critical situation following a disruption. This is where ‘everyday planning’ and formats of planning experimentation, such as international building exhibitions (BMI/BBSR, 2021, see also The New Leipzig Charter, 2020), play a decisive role. These formats bring novel solutions to prototypical practical implementation and spread knowledge of these solutions within professional communities. Furthermore, due to the indeterminacy of disruptive events, it is necessary to have redundant options available. Planners must be prepared to waste options, as not all solutions available will eventually be put into practice. The problem of scarcity does not involve a lack of solutions but a lack of opportunities to use solutions. Improvisation has a strong affinity to adaptive approaches to planning (a good overview is provided in Meadows & Kreutz, 2021). It is driven by the dialectical relationship between organized structures and freedom for spontaneous responses that is difficult (though not impossible) to achieve in overly formalized and static planning systems.

Second, planners should develop the ability to ‘tactfully’ (Kornberger *et al.*, 2019) introduce transformative change from a rich repertoire of novel solutions at appropriate times and when society is receptive to change. Transdisciplinary approaches to knowledge generation (coproduction of knowledge) are of crucial importance here, as is already generally known from research on transformative governance (Chaffin *et al.*, 2016), disaster research (Andharia, 2020) and specifically flood management (e.g. Gersonius *et al.*, 2016). With their help, it is possible not only to further diversify the stock of practice-proof solutions but also to create ‘epistemic communities’ (Haas, 1992) at the intersection of science and practice (Füg & Ibert, 2020) consisting of latent networks among practitioners that are activated on short notice in the event of a disruption to respond quickly. Communities, in other words, provide a social infrastructure that enables improvisation.

6. To Conclude: Planning Theory Should Realign Sustainability and Resilience

In our view, the COVID-19 pandemic experience suggests the future will be radically open and widely unknown. It is necessary to appreciate and embrace the idea that even though many long-term trends are known and well understood, the future will most likely deviate from our present expectations. Moreover, the path towards the future is not steady. Rather, we will probably soon encounter further disruptions – in fact, as we work on this article, Western and Central European states, such as Germany, Austria, Switzerland, Belgium and the Netherlands, are hit by hazardous floods that also qualify as a disruption. Disruptions show that developments over time are characterised by non-linearity and by surprising changes in speed and direction. We do not know what other unexpected events the future holds, but we must expect them to surprise us. At the same time, recent experience also shows that long-term action, similar to situational reaction, can have major consequences at moments of uncertainty. These consequences are more likely to have a desired direction if we prepare in everyday life. In the former paragraphs, we mentioned a redundancy of stock solutions, the operationalisation of societal values as a fundamental sensorium for vulnerabilities, the cultivation of epistemic communities, developing skills of planners in the smart use of digital data, expanding transdisciplinary research to generate a redundancy of practice proof solutions and to enact social networks between professionals across sectors.

Taken together, these ideas suggest realigning the sustainability paradigm by integrating aspects of resilience thinking (Elmqvist *et al.*, 2019; Brand, 2020). Criticism of the concept of sustainable development and sustainability-oriented spatial planning was already widespread before the coronavirus crisis, for example in the accusation of an overly static orientation and a linear understanding of planning (Wiechmann, 2008; Elmqvist *et al.*, 2014). Along these lines, we regard visions and long-term orientations, as they are constitutive of sustainability, as important for planning practice. However, they are less likely to achieve a defined state with detailed action programmes and available resources in the future. Rather, in light of our experiences with the coronavirus crisis, sustainability will have to be understood even more strongly than before as a process that can be planned only to a limited extent. The ability to deal with disruptive events must become more central in the future.

Furthermore, resilience should be interpreted here less as a form of adaptation to a widely understood environment and more as a general ability to adapt to changing and widely unknown circumstances (Grabher & Stark, 1997; Hu & Hassink, 2020). Resilience as a future-open process requires an attitude of permanent adaptability and a general culture of learning (Heintz *et al.*, 2012). Long-term goals are still needed in such an approach because they provide orientation and direction. However, they will have to be pursued more flexibly and better adapted to local conditions and socio-political constellations. Nevertheless, the goals and procedures themselves must also be subject to revision in the sense of a resilience check. Relevant principles of resilience in this context are a greater willingness to act experimentally; think in scenarios (including those that play out worst-case developments); establish a learning orientation through monitoring and evaluation; and establish a cooperative, intersectorally coordinated administrative

culture (ARL, 2021). Especially scenario planning is an elaborated tool in planning (Goodspeed, 2020), an established part of risk management (Berariu *et al.*, 2016) and a communication instrument in climate change debates.

The longer-term consequences of the coronavirus pandemic for the strategic orientation of urban and regional planning are not yet fully foreseeable. The developments that are vaguely emerging in this context, however, appear rather ambivalent. On the one hand, it is pointed out that COVID-19 has underlined the need to restructure infrastructures and public spaces (for example, demands for ‘more green’ and ‘more justice in the use of public spaces’). In this respect, the virus acts as a catalyst for the implementation of concepts of a sustainable and healthy city that have already been pursued for some time (Bailey *et al.*, 2020).

On the other hand, previously recognised guiding principles such as the ‘compact city’ have come under pressure. Especially in the early phase of the pandemic, there were numerous voices that considered the higher population and settlement density in large cities as a factor in the spread of the virus. This led to calls for ‘de-densification’ and ‘decentralisation’ of the settlement system (Jabareen & Eizenberg, 2021). However, more land-consuming forms of urban development would not only conflict with the goals of conserving land and natural resources but also confuse cause (income, etc.) and effect (population density). It can also be noted that many governmental recovery programs do not show a convincing transformation agenda, for example on climate policy issues (Hepburn *et al.*, 2020; IISD, 2020). Stimulus programs seem to be more interested in rapid economic recovery using conventional growth and consumption stimulus. The climate and sustainability policy mobilization evident at the end of the past decade (initiated by the ‘Fridays for Future’ movement and others) could wane with the prioritization of short-term economic stabilization goals in response to the COVID-19 crisis.

The reactions of planning administrations, as organization oriented to comparatively persistent normative models and routines, to the coronavirus crisis within their institutional guidelines has hardly been the subject of research. In the future, this will also open a large field of activity for critical urban and regional research. The question is whether and how new, resilient forms of planning will prevail and what new governance structures will emerge in the process. This particularly applies to the inclusion of the experiential knowledge of various actors involved in crisis management. Utilising this wealth of knowledge is an important prerequisite for functional and widely accepted action that is oriented towards resilience and sustainability in the future.

In order to avoid a situation where insufficient attention to the consequences of the pandemic as well as the need for change – as described at the beginning of the article – will determine everyday planning routines soon, the planning community could be a frontrunner in future debates, also in politics and administration. Taking responsibility for the future means leading the necessary debates. We all know that the road to implementation will be long and difficult.

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References

- Acuto, M., Larcom, S., Keil, R., Ghojeh, M., Lindsay, T., Camponeschi, C., & Parnell, S. (2020) Seeing COVID-19 through an urban lens, *Nature Sustainability*, 3(December 2020), pp. 977–978. doi:10.1038/s41893-020-00620-3.
- Andharia, J. (2020) Thinking about disasters: A call for intersectionality and transdisciplinarity in disaster studies, in: J. Andharia (Ed) *Disaster Studies. Exploring Intersectionality in Disaster Discourse*, pp. 3–32 (Singapore: Springer).
- ARL – Akademie für Raumentwicklung in der Leibniz-Gemeinschaft (ed.). (2021) *SARS-Cov-2-Pandemie: Was lernen wir daraus für die Raumentwicklung?* (Hannover: Positionspapier aus der ARL 118).
- Bailey, D., Clark, J., Colombelli, A., Corradini, C., De Propriis, L., Derudder, B., Fratesi, U., et al. (2020) Regions in a time of pandemic, *Regional Studies*, 54(9), pp. 1163–1174. doi:10.1080/00343404.2020.1798611.
- Batty, M. (2021) Science and design in the age of COVID-19, *Environment and Planning B: Urban Analytics and City Science*, 48(1), pp. 3–8.
- Berariu, R., Fikar, C., Gronalt, M., & Hirsch, P. (2016) Training decision-makers in flood response with system dynamics, *Disaster Prevention and Management*, 25(2), pp. 118–136. doi:10.1108/DPM-06-2015-0140.
- BMI/BBSR Federal Institute for Research on Building, Urban Affairs and Spatial Development/ Federal Office for Building and Regional Planning/Competence Center International Building Exhibitions. (2021) *Internationale Bauausstellungen*. Available at <https://www.internationale-bauausstellungen.de/en/> (Accessed 28 June 2021).
- Boin, A., Ekengren, M., & Rhinard, M. (2021) *Understanding the Creeping Crisis*. Palgrave Pivot (Cham: Palgrave Macmillan).
- Bolleter, J., . . . , Cameron, E. R., Foster, S., Foster, S., Foster, S., & Hooper, P. (2021) Implications of the Covid-19 pandemic: canvassing opinion from planning professionals, *Planning Practice & Research* (online first), pp. 1–22. doi:10.1080/02697459.2021.1905991.
- Brand, K.-W. (2020) Nachhaltigkeitsperspektiven in der (Post-)Corona Welt. Globale Umbrüche und die Herausbildung neuer Resilienzregime, in: B. Görgen, M. Grundmann, N. Haarbusch, D. Hoffmeister, & B. Wendt (Eds) *Sonderband II: Die sozial-ökologische Transformation in der Corona-Krise*, pp. 10–20 (Münster: WWU Münster, Institut für Soziologie).
- Brinks, V., & Ibert, O. (2020) From corona virus to corona crisis: the value of an analytical and geographical understanding of crisis, *Tijdschrift Voor Economische En Sociale Geografie*, 111(3), pp. 275–287. doi:10.1111/tesg.12428.
- Chaffin, B. C., Ahjond, S., Garmestani, L. H., Gunderson, M., Harm Benson, M., Angeler, D. G., Arnold, C. A., Cosens, B., Kundis Craig, R., Ruhl, J. B., & Allen, C. R. (2016) Transformative environmental governance, *Annual Review of Environment and Resources*, 41(1), pp. 399–423. doi:10.1146/annurev-environ-110615-085817.
- Christmann, G. B., & Ibert, O. (2012) Vulnerability and resilience in a socio-spatial perspective. A social-scientific approach, *Raumforschung und Raumordnung*, 70(4), pp. 259–272. doi:10.1007/s13147-012-0171-1.
- Davoudi, S., Brooks, E., & Mehmood, A. (2013) Evolutionary resilience and strategies for climate adaptation, *Planning Practice & Research*, 28(3), pp. 307–322. doi:10.1080/02697459.2013.787695.
- Davoudi, S., & Ormerod, E. (2021) Viewpoint: Hope and despair at the time of pandemic, *Town Planning Review*, 92(3), pp. 317–322. doi:10.3828/tpr.2020.77.
- Deutsch, K. W. (1973) Zum Verständnis von Krisen und politischen Revolutionen, in: M. Jänicke (Ed) *Herrschaft und Krise*, pp. 90–100 (Basel & Stuttgart: UTB).

- Deutscher Bundestag. (2013) *Unterrichtung durch die Bundesregierung - Bericht zur Risikoanalyse im Bevölkerungsschutz 2012*. Drucksache 17/12051 (Berlin).
- Dörre, K. (2020) Die Corona-Pandemie – Eine Katastrophe mit Sprengkraft, *Berliner Journal für Soziologie*, 30, pp. 165–190. doi:10.1007/s11609-020-00416-4.
- Elmqvist, T., Andersson, E., Frantzeskaki, N., Olsson, P., Gaffney, O., Takeuchi, K., & Folke, C. (2019) Sustainability and resilience for transformation in the urban century, *Nature Sustainability*, 2, pp. 267–273. doi:10.1038/s41893-019-0250-1.
- Elmqvist, T., Barnett, G., & Wilkinson, C. (2014) Exploring urban sustainability and resilience, in: L. Pearson, P. W. Newton, & P. Roberts (Eds) *Resilient Sustainable Cities*, pp. 19–28 (New York: Routledge).
- ESPON. (2020) Geography of COVID-19 outbreak and first policy answers in European regions and cities. *Policy Brief*, December. Luxembourg.
- Florida, R., & Seman, M. (2020) *Measuring COVID-19's Devastating Impact on America's Creative Economy* (Washington, DC: Brookings Institution).
- Franch-Pardo, I., Napolitano, B. M., Rosete-Verges, F., & Billa, L. (2020) Spatial analysis and GIS in the study of COVID-19. A review, *Science of the Total Environment*, 739, pp. 140033. doi:10.1016/j.scitotenv.2020.140033.
- Füg, F., & Ibert, O. (2020) Assembling social innovations in emerging professional communities: The case of learning region policies in Germany, *European Planning Studies*, 28(3), pp. 541–562. doi:10.1080/09654313.2019.1639402.
- Geels, F. W. (2002) Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study, *Research Policy*, 31(8–9), pp. 1257–1274. doi:10.1016/S0048-7333(02)00062-8.
- Gersonius, B., van Buuren, A., Zethof, M., & Kelder, E. (2016) Resilient flood risk strategies: Institutional preconditions for implementation, *Ecology and Society*, 21(4), pp. 28. doi:10.5751/ES-08752-210428.
- Global Preparedness Monitoring Board. (2019) *A World at Risk: Annual Report on Global Preparedness for Health Emergencies*. Geneva. Available at <https://www.preventionweb.net/publications/view/67706> (accessed 22 September 2021).
- Goodspeed, R. (2020) *Scenario Planning for Cities and Regions* (Cambridge, USA: Lincoln Institute of Land Policy).
- Grabher, G., & Stark, D. (1997) Organizing diversity: Evolutionary theory, network analysis and postsocialism, *Regional Studies*, 31(5), pp. 533–544. doi:10.1080/00343409750132315.
- Gupte, J., & Mitlin, D. (2020) COVID-19: What is not being addressed, *Environment and Urbanization*, 33(1), pp. 211–228. doi:10.1177/0956247820963961.
- Haas, P. M. (1992) Introduction: Epistemic communities and international policy coordination, *International Organization*, 46(1), pp. 1–35. doi:10.1017/S0020818300001442.
- Heintz, M., Hagemeyer-Klose, M., & Wagner, K. (2012) Towards a risk governance culture in flood policy—Findings from the implementation of the “Floods Directive” in Germany, *Water*, 2012 (4), pp. 135–156. doi:10.3390/w4010135.
- Hepburn, C., O’Callaghan, B., Stern, N., Stiglitz, J., & Zenghelis, D. (2020) Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?, *Oxford Review of Economic Policy*, 36, pp. 359–381. doi:10.1093/oxrep/graa015.
- Hu, X., & Hassink, R. (2020) Adaptation, adaptability and regional economic resilience: A conceptual framework, in: G. Bristow & A. Healey (Eds) *Handbook on Regional Resilience*, pp. 54–68 (Cheltenham & Northampton, MA: Edward Elgar).
- IISD (International Institute for Sustainable Development). (2020) *G20 governments have committed USD 151 billion to fossil fuels in COVID-19 recovery packages*. Press Release, July 14, 2020. Winnipeg. Available at <https://www.iisd.org/articles/g20-governments-have-committed-151-billion-fossil-fuels-covid-19-recovery-packages> (accessed 22 September 2021).
- Kanda, W., & Kivimaa, P. (2020) What opportunities could the COVID-19 outbreak offer for sustainability transitions research on electricity and mobility?, *Energy Research & Social Science*, 68, pp. 1–5. doi:10.1016/j.erss.2020.101666.

- Kistemann, T. (2021) *COVID-19: Pandemische Delle in der Raumzeit*. Vortrag auf dem Raumwissenschaftlichen Kolloquium 2021 (Bonn: Institut für Hygiene und Public Health, GeoHealth Centre Universitätsklinikum Bonn).
- Knight, F. H. (1921) *Risk, Uncertainty and Profit* (Kissimmee: Signalman Publishing).
- Kornberger, M., Leixnering, S., & Meyer, R. E. (2019) The logic of tact: How decisions happen in crisis, *Organization Studies*, 4(2), pp. 239–266. doi:10.1177/0170840618814573.
- Kuebart, A., & Stabler, M. (2020) Infectious diseases as socio-spatial processes: The COVID-19 outbreak in Germany, *Tijdschrift Voor Economische En Sociale Geografie*, 111(3), pp. 482–496. doi:10.1111/tesg.12429.
- Markard, J., & Rosenbloom, D. (2020) A tale of two crises: COVID-19 and climate. sustainability, *Science, Practice and Policy*, 16(1), pp. 53–60.
- Meadows, S., & Kreutz, A. S. (2021) Constrained by order: Challenges to reform in Victoria's planning system, *Planning Practice & Research* (online first), pp. 1–18. doi:10.1080/02697459.2021.1954749.
- Meerow, S., & Newell, J. P. (2019) Urban resilience for whom, what, when, where, and why? *Urban Geography*, 40(3), pp. 309–329.
- Mein, S. A. (2020) COVID-19 and health disparities: The reality of 'the great equalizer', *Journal of General Internal Medicine*, 35(8), pp. 2439–2440. doi:10.1007/s11606-020-05880-5.
- The New Leipzig Charter. (2020). *Adopted at the informal ministerial meeting on urban matters on 30 november 2020*. Available at https://ec.europa.eu/regional_policy/sources/docgener/brochure/new_leipzig_charter/new_leipzig_charter_en.pdf
- ONS (Office for National Statistics). (2020) *Coronavirus (COVID-19): Latest data and analysis on coronavirus (COVID-19) in the UK and its effect on the economy and society*. Available at <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases> (accessed 17 June 2021).
- Rosa, H. (2020) Pfadabhängigkeit, Bifurkationspunkte und die Rolle der Soziologie. Ein soziologischer Deutungsversuch der Corona-Krise, *Berliner Journal für Soziologie*, 30, pp. 191–213. doi:10.1007/s11609-020-00418-2.
- Sensier, M., Bristow, G., & Healey, A. (2016) Measuring regional economic resilience across Europe: Operationalizing a complex concept, *Spatial Economic Analysis*, 11(2), pp. 128–151. doi:10.1080/17421772.2016.1129435.
- Stark, D. (2020) Testing and being tested in pandemic times, *Sociologica*, V.14 N.1.
- United Nations. (2020). *Policy Brief: COVID-19 in an Urban World* (New York City).
- Weick, K. E. (1993) The collapse of sensemaking in organizations: The Mann Gulch disaster, *Administrative Science Quarterly*, 38(4), pp. 628–652. doi:10.2307/2393339.
- Wiechmann, T. (2008) *Planung und Adaption. Strategieentwicklung in Regionen, Organisationen und Netzwerken* (Dortmund: Verlag Dorothea Rohn).