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COVID-19 pandemic: Lessons for spatial development

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Positionspapier aus der ARL 137

COVID-19 PANDEMIC: LESSONS FOR SPATIAL DEVELOPMENT

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COVID-19 PANDEMIC: LESSONS FOR SPATIAL DEVELOPMENT

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Lessons learned from the pandemic: Summary of recommended actions

Recommendations for local authorities: *Resilient social and spatial structures* are the prerequisite for crisis management and crisis preparedness for housing, public and private infrastructure, and *resilient mobility* to boost non-motorised transport. This includes the reorganisation of freely accessible public spaces combined with the mobilisation and organisation of mobility services at short notice as part of risk management. *Adequate green and open spaces* must be adequately dimensioned and equipped to fulfil the functions allocated to them, and they should be interconnected to reduce and compensate for physical and psychological stress related to crowding and climate change. This also includes the development of plans for interconnected multifunctional spaces. In addition to centralised facilities, of particular importance are the needs-based *neighbourhood facilities and organisational structure* of health-related services (in cooperation with medical facilities such as hospitals and private practices) and the supply of everyday goods and services, but also of schools, care facilities, and mobility services. *Small-scale (social space) data are required to improve the standards of facilities* and measures for achieving them with assistance from *urban development promotion* (Social Cohesion and Living Centres programmes).

Recommendations for regional actors: *Integrated regional development strategies* should be assessed in terms of pandemic resilience and revised as necessary; any insights gained should be incorporated into (legally binding) regional planning. Systematic integration of the *concept of spatial risk prevention* in spatial observation, risk analyses, weighing processes and spatial planning instruments used in regional planning is called for. Regional partnerships play a role in *improving equivalence, risk prevention and public service provision*, and digital connectivity helps to supply people with goods and services; both should be implemented through the promotion of urban development and/or the establishment of a new *regional funding programme* to improve the equivalence of living conditions and regional resilience.

Recommendations for the federal states: *The review and, if necessary, revision of the scenarios* outlined in parliamentary document (*Bundestagsdrucksache*) 17/12051 of 3 January 2013 is needed. The different *standards and requirements for regional facilities* should be examined in

detail, taking into consideration the standards for facilities in the central place system, and defined accordingly. The orientation and specialisation in a tiered supply model aimed at accessibility, an adequate supply of goods and services at the different levels, and needs-based bundling of services must all be ensured. Federal state spatial planners should add *health-related risk prevention* to their tools and push for the development of pandemic master plans in cooperation with policymakers in sectors such as transport, logistics and medical services. As part of spatial planning's coordinating responsibility for multi-level access in spatially-relevant plans and measures (according to section 7(4) of the Federal Spatial Planning Act (*Raumordnungsgesetz, ROG*)), the envisaged number of hospitals and their reserve capacity should be reviewed and plans should be drawn up. Should border closures nevertheless become necessary to fight the pandemic, consultation routines for *rapid and concerted cross-border action* need to be developed (cross-border cooperation according to section 24 of the Federal Spatial Planning Act).

Recommendations for the federal government: A change of the Federal Spatial Planning Act with the reformulation of section 2(2) no. 7 is proposed, to stipulate that the spatial requirements of defence, civil protection and health protection must be accommodated. Interagency approaches should contribute *spatial planning's integrative perspective* to systematic analyses of the pandemic's effects on spatial development (on critical infrastructure among other things) and of the vulnerability of society, space and the economy in a pandemic, and to the elaboration of scenarios for different trajectories of a pandemic and for the potential long-term effects on spatial development and any necessary adjustments. Explicitly anchoring equivalent living conditions not only as a government policy objective but also in a revision of 'Concepts and Strategies for Spatial Development in Germany' (2016) with regard to the COVID-19 pandemic supports this. The *spatial development funding programme, analogous to urban development promotion* as a form of federal financial assistance based on article 104b of the German Basic Law (*Grundgesetz, GG*) and funded through an administrative agreement between the federal government and the federal states, would offer flexibility and independent implementation for the regions in particular. *Spatial observation* should be supplemented with appropriate research programmes on the spatial effects of pandemics.

Recommendations at the European level: The objectives, concepts and implementation strategies for sustainable, balanced European spatial development need to include aspects of social justice and spatial equity; vulnerability; the resilience of spatial structures and social and technical infrastructures; coping with the effects of climate change; and health protection and healthcare (Territorial Agenda 2030; Leipzig Charter 2020). In *European spatial observation*, strategies, concepts and measures for dealing with pandemics and climate change should be discussed and coordinated in a timely and proactive manner and refined in model projects taking a *multilevel approach* to exchanging information, coordinating strategies and concepts, and harmonising measures and their implementation across borders in authorised, direct cooperation while respecting the subsidiarity principle.

1 Background and aims of this position paper

Since the COVID-19 pandemic began, it has become ever clearer that it poses an enormous challenge for society. The lockdown imposed on large parts of public life, which hit all social groups and institutions relatively abruptly with a wide range of impacts, as well as the measures adopted subsequently have resulted in radical changes in our living conditions. In some cases, the crisis has acted as an accelerator of trends affecting processes that were already ongoing: the digitalisation of communications and educational processes, the growth in working from home and mobile working arrangements, the expansion of online retail, changes in travel behaviour (in favour of cars and bicycles), and the establishment of regional service networks. At the same time, there has been a braking effect on sectors such as long-distance travel, global trade, trade fairs and cultural

events, as well as on progress towards gender equality in the division of labour for household responsibilities and childcare. Socio-spatial, infrastructural, economic and ecological effects are becoming increasingly apparent.

For those involved in spatial development and spatial planning, urgent questions arise not only about the weaknesses that have become apparent in our spatial uses in terms of infrastructure and public service provision, the economy and ecology, and in our ways of life in terms of housing and the supply of goods and services, but also about what opportunities have emerged for sustainable and self-determined lifestyles. What conclusions for anticipatory and preventive planning can be drawn from these (provisional) findings?

Using a critical, multidisciplinary and integrative examination of the spatially-relevant effects of the COVID-19 pandemic, this paper establishes connections between the crisis management of today and crisis preparedness concepts for potential future pandemics. Building on that, it proposes corresponding recommended actions. These actions relate not only to insights for medium-term space-related crisis management but also to conclusions on long-term strategic challenges for spatial development in view of pandemics to be expected in the future.

For this position paper, the ‘Pandemic and Spatial Development’ Ad hoc Working Group at the ARL – Academy for Territorial Development in the Leibniz Association has compiled interdisciplinary perspectives from spatial development and spatial planning, public health services, epidemiology, economics and social sciences, and has condensed them into transdisciplinary recommendations for action. These recommendations are directed at the various action levels for spatial development and spatial planning.

2 From crisis management to strategic crisis preparedness – focal points and organisational structures

The COVID-19 pandemic has revealed the problems and shortcomings of the sole use of crisis management and demonstrated the need for strategic crisis preparedness. The objective is to be better prepared for situations that involve long-term changes (as is also the case for climate change) and whose type, nature, geographical distribution and ultimate course can only be predicted with great uncertainty. Focal points for spatial planning and its instruments, procedures and actors are presented below. They are oriented toward resilience, sustainability, justice and the equivalence of living conditions.

Sustainable spatial development requires strategic public service provision and risk prevention that anticipate unexpected events and their impact on society and regions with concrete plans and strategies for action. This means those actors involved in planning need to adopt new conceptual approaches and forms of cooperation that not only focus on hazards and risks but also consider the resources already available in our regions and cities. They must also examine the future opportunities that can result, for example, from the prioritisation of active mobility, social and environmental justice, or digitalisation.

2.1 Resilience and sustainability in the pandemic

The pandemic crisis was a ‘stress test’ for all of our social systems. This stress test is an urgent call for us to take a closer look at the resilience of our cities and regions. What does **resilience to a pandemic**, and to the measures taken in response, mean from the perspective of spatial planning? Of course, the notion of resilience involves proactively reducing existing risks and vulnerabilities, providing better protection for critical infrastructure, designing more robust land uses and

functions, and promoting redundancy and multi-functionality. Yet, it is also important to strengthen resources that can become effective during crises. The particular need for resource orientation is demonstrated by the discussions about the importance of green infrastructure in cities, more urban spaces for active mobility (walking, cycling), and neighbourhood structures that promote social cohesion. Also essential here is the public's trust in institutions, which includes those responsible for spatial development.

A further key aspect of resilience involves the capacity of urban and regional systems and structures and of the public **to cope and adapt**. These abilities also need to be strengthened from the beginning of an incident. By deploying ad hoc strategies that are based on tried and tested practices, this could also help to deal more quickly with the crisis and to better compensate for the additional burden. Here too, however, the objective cannot merely be a return to pre-crisis conditions. Instead, learning processes must be actively used to improve spatial and other structures, planning and other processes, and the allocation of responsibilities, and prepare them for the future. This becomes clearest when we consider the failures to exploit the positive aspects of digitalisation, or the importance and usefulness of public spaces, and rightfully urge that the situation arising from the pandemic be seen as an opportunity. In this respect, the notion of resilience also implies a strong focus on processes.

The connection with sustainable and **health-promoting spatial development** becomes apparent here: times of crisis are outstanding opportunities to critically examine growing or intensifying social inequalities and the sustainability of spatial structures and land use, and to prepare for any necessary change, adaptation and transformation. In so doing, it is of course necessary to consider the connections between social situations and spatial structure and land use; all of these have direct and indirect impacts on health. Factors relating to social disparities are thus also taken into consideration in this paper (for example, when equivalence is addressed).

2.2 Equivalence

A second important focal point is the equivalence of living conditions as formulated in section 1 (2) of the Federal Spatial Planning Act (Raumordnungsgesetz, ROG), which stipulates that the guiding principle of spatial development is sustainable spatial development that leads to lasting, large-scale, balanced arrangements with equivalent living conditions. Equivalence as a focal point requires us not only to continue upholding the hitherto established principles for ensuring equivalence but also to consider the aforementioned intensification of inequalities caused by pandemics.

Providing for lasting equivalence requires that spatial actors at the various levels have sufficient resources to be able to realise these tasks. Public **finances and their allocation** thus become key considerations. The allocation of public finances at the various levels is a perennial issue, but it has gained in urgency and visibility with the new demands related to the pandemic. Furthermore, it can be assumed that tasks will grow in number and/or shift during the course of a pandemic, while the economic consequences of the pandemic will lead to reduced public revenues. As a result, conflicts over priorities and the allocation of resources will intensify. The many existing and newly emerging demands and expectations will present decision-makers at all spatial levels with very difficult decisions about priorities (weighing opportunity costs).

The basis for informed decisions is a wide-ranging debate on the following:

- > aspects of equivalence (and changes in them) as a result of the pandemic,

- > the ranking of social and political priorities,
- > decision-making on the allocation of resources.

This entails extremely demanding requirements for rational discourse and processes for reaching and implementing compromises. From the spatial perspective in particular, it is important to monitor existing and any emerging disparities (such as the health consequences of social inequalities in environmental conditions and access to opportunities) so as to prevent further divergence. Disparities that were once more commonly seen in larger sub-regions (such as labour-market regions) are also evident at the local level, with opportunities differing even among adjoining neighbourhoods, especially in the cities; initial analyses of the impact of the COVID-19 pandemic confirm this.

2.3 Spatial risk prevention and the provision of public service as key foci for strategic crisis preparedness

To establish more resilient spatial structures and land uses and thereby support strategic crisis preparedness, spatial planning actors should address two basic focal points: **spatial risk prevention and public service provision**. Both play a key role in reducing risks and vulnerabilities, managing crises when they occur, and in learning from and adjusting to them afterwards.

Although confronting climate change has already led to the development of some routines for adapting to climate change and thus for dealing with risk, spatial risk prevention has found very limited application as a strategic and integrative approach in planning practice thus far (BBSR 2020). As with climate change adaptation and climate risks, spatial risk prevention addresses all spatially-relevant hazards, their spatial and social impacts, and any individual or multiple risk situations that (may) result. In the context of a spatial development process focusing on resilience and sustainability, it aims to systematically review hazards and reduce existing risks where possible. One of its priorities is the assessment of sensitive or vulnerable structures and population groups, and land uses that would be potentially hazardous in the event of an incident. The objective is to systematically build up knowledge about hazards, vulnerabilities, risks and cascade effects, and to bring that knowledge to bear in spatial planning deliberations. The mere fact that basic principles and methods for grasping the status quo are lacking is evidence enough of the exceptional complexity of this task; there is still considerable need for research in this field (BBSR 2020). The uncertainties increase considerably as we look forward into the future: the pandemic has shown us that a situation previously inconceivable to many has arisen, with thus far unforeseeable medium- and long-term consequences.

The current learning process is helpful in this regard, offering an extraordinary opportunity. It is becoming clear that dealing with uncertainties **demands** that **spatial planning be oriented toward the future**—it is too often captive to current conditions and constraints. Incident scenarios can assist in working through the effects of potential incidents like pandemics or climate changes, revealing ‘if-then’ solutions useful for spatial development. The ultimate aim is to support processes for the continuous adaptation not only of spatial structures, land use and infrastructure systems but also for work processes, cooperative arrangements and responsibilities in order to improve resilience and crisis resistance. The focus here is more on flexibility and multi-functionality in spatial development as well as a fundamental openness toward functions, which may at times conflict with efficiency criteria.

In this context, **critical infrastructure** plays a special role. Infrastructure is crucial to the functioning of our cities and regions – it is ‘system critical’¹, so to speak. Germany’s Federal Office for Civil Protection and Disaster Assistance (Bundesamt für Bevölkerungsschutz und Katastrophenhilfe, BBK) notes that spatial planning brings a cross-sectoral approach to the protection of critical infrastructure with its spatially-based approach to risk management (BBK 2020: 10). Also, section 2(2)(3) sentence 4 of the Federal Spatial Planning Act calls for the protection of critical infrastructure, but thus far this mandate has not been adequately observed in actual planning practice. Times of crisis raise urgent questions about how critical infrastructure is handled in spatial planning.

Spatial risk prevention and public service provision play complementary roles here. Many facilities and enterprises – for example in the IT, transport and energy sectors or the healthcare system (public health service, (outpatient) care) and the healthcare industry, as well as water supply, agriculture, the food industry and local services – are pillars of public service provision and also count as critical infrastructure.

During the pandemic, the **healthcare system** in particular has been at the centre of attention as critical infrastructure. Though it proved to be generally effective at the beginning of the COVID-19 pandemic, the crisis also laid bare its infrastructural needs and weaknesses. The current crisis makes it clear that the healthcare system requires a regionalised structure that works even in a crisis to ensure the comprehensive provision of public services. To ensure adequate healthcare for the population during a pandemic and to provide equitable healthcare even in peripheral rural regions, factors such as population density, patient flows, accessibility and health risk factors must be taken into consideration just as much as the degree of (de)centralisation of facilities and the rigorous implementation of methods for freeing up resources, such as telemedicine and the further pursuit of interface-oriented digitalisation throughout the healthcare system (Völker 2020).

In a crisis, **accessibility and mobility** are crucial factors in maintaining the operation of critical infrastructure and continuing to provide public services. Regional location planning has significant scope for influence in this regard. For example, the accessibility of hospitals is relevant to both patients and staff (see section 3.2).

2.4 Principle of integration and cooperation

The principle of **Health in all Policies**, an approach integrating health considerations into all policymaking areas as an overall social responsibility, is applied in public health policy. This principle calls for all policymaking departments, and thus also those involved in spatial planning, to do everything they can for health promotion, prevention and healthcare provision to achieve equal opportunity in healthcare (‘health equity in all policies’) (Baumgart/Köckler/Ritzinger et al. 2018; Bolte/Bunge/Hornberg et al. 2018; Köckler/Sieber 2020; Böhm/Bräunling/Geene et al. 2020).

Different departments can **network** with each other – independently of pandemics – particularly those responsible for spatial planning, public health, the environment, the economy and social services. This requires the re-evaluation of administrative processes, structures and competencies and addressing the question of whether city and district health authorities are involved in planning activities and/or are on planning offices’ lists of public agencies.

¹ This is a literal translation of the term ‘systemrelevant’, which has been central to the German debate throughout the pandemic. It has mostly been used to describe groups that played a critical role in keeping the whole system running during different phases of the pandemic (e.g. health care, food retail, transport workers, etc.). As these groups are often under-appreciated and underpaid, the pandemic has sparked a debate about improving their working conditions in general. In addition, the term has been used by politicians as justification for applying different restrictions to certain parts of society. Beyond its literal meaning this term is thus central to a more complex debate about those groups and elements of society that are of crucial systemic importance but that are also in need of improvements to ensure that they can continue to fulfil their critical roles.

The lack of (digital) **data availability** for integrated, data-based, and, ideally, evidence-based decision-making has become apparent during the pandemic. Municipal health reporting has an adequate (socio-)spatial focus in only a few cities, and the digitalisation of data collection and data processing in the public health services is currently also inadequate. The integration of data from different departments on a single spatial level or across multiple levels remains severely limited. The immediate spatial integration of various types of data is urgently needed for prompt site planning of test and care centres during crises. In addition to methodological expertise, this also calls for the corresponding availability of data and technology (see sections 3.1 and 3.3). Data-driven decision-making needs to account for the challenge of different perspectives on the significance of evidence and policies in the different departments. An overarching aim should be transparent, clear decision-making processes that can strengthen public trust in political and administrative decision-making. Furthermore, sound health planning at local authority level requires not only solid data analysis but also the broad participation of both the public and government departments.

To address the crisis, **interagency crisis teams** are already being set up at local authority and supra-local authority levels to provide answers to pressing questions, decide on protective measures, and mandate measures with local scope based on the results of infection chain tracing. However, this is not taking place as part of a long-term strategy and should instead be seen as a challenge to be confronted cooperatively in its long-term dimension. Accordingly, crisis teams need to be considered in more detail and should deal with the different phases of a pandemic. Thus, in accordance with the cooperation and integration principle, **pandemic plans** should be developed across departments and actors, drawing on spatial planning expertise and including spatial dimensions (see section 3.3). These structures and experiences can be applied to deal with other adverse situations such as the impact of climate change.

3 Lessons learned from the crisis: recommended actions

This chapter is organised according to the addressed action levels, presenting spatial planning and spatial development strategies relevant to the spatial context and planning instruments appropriate to those levels. Though the pandemic and reactions to it have brought cases of fragmented authority to light, they have also shown the advantages of federal and decentralised structures which have a high level of flexibility, for example in communication among health actors (see chapter 4) and lower vulnerability in comparison to centralised systems. Such flexibility should be retained. It has also become very clear that both the relevant sectoral planning and the integrative spatial planning need to be (fundamentally) repositioned in risk management.

Service provision in the context of crisis management and crisis preparedness is based on state and local authority services (the service principle of ‘transfer’) in close connection with services by local civil society (the service principle of ‘reciprocity’), but also on services provided by local businesses (the service principle of ‘the market’). Purposeful cooperation among all involved parties requires greater resources for communication and coordination (time, staff and technology).

The recommended actions address levels ranging from the local authority level to supra-local levels and the European Union.

3.1 Recommendations for local authorities

Previous catastrophes have often led to the reorganisation of spatial and social living arrangements and infrastructures as well as to changes in land use and values. Public service provision, crisis management and crisis preparedness are organised and implemented in cities, settlements and

neighbourhoods. The foundations for sustainable development, resilience, networks and cooperation (both social and economic) are laid in these areas. This is where the tasks and functions of local communities are realised (article 28(2) of the German Basic Law (*Grundgesetz*, GG)).

Resilient social and spatial structures are prerequisites for crisis management and crisis preparedness and need to be developed for the housing situation at hand and the entire range of public and private infrastructure in order to provide solidarity, cooperation, and mutual physical and psychological support. This applies equally to population groups in terms of age and social/income structures and to their inclusion in labour and economic processes. This requires local authorities to organise and at least partially finance infrastructural prerequisites, suitable spatial structures (density, mix/multi-functionality, contact areas/points, open spaces, climate resilience, etc.) and service provision (services, support, organisation, management, communication, etc.). The potential courses of action require a systematic examination of the extent to which they contribute to the implementation of the goals and principles of sustainability, climate protection and resilience. An active land policy promotes a mixture of land uses.

This applies to traditional **planning instruments**, particularly urban and borough development strategies, preparatory and binding land-use plans, and traffic and infrastructure plans. For the most part, pandemic-related spatial requirements need to be fulfilled within the existing spatial framework so that they can also be justified in urban development policy terms under 'normal' conditions; this is also the case given that, as a rule, it is highly unlikely that more land will be available in neighbourhoods, cities and regions than before.

Resilient mobility strategies call for tighter integration of transport modes and their networks and the promotion of non-motorised transport within the eco-mobility framework. Furthermore, freely accessible public spaces will need to be reorganised while ensuring that commercial and delivery traffic is not compromised. Both for environmental and climate protection reasons and taking account of the consequences of the pandemic, more space should be made available in public spaces for active mobility and 'stationary pedestrians' (people standing or sitting), and appropriate infrastructure such as roadside trees and benches. Parked private cars and wide streets reserved for private motor vehicle transport are inconsistent with social distancing requirements, and they impair the quality of the spaces in which people spend time. In principle, today's temporary rearrangement of traffic areas in favour of non-motorised transport should be made permanent.

Improvements to the attractiveness of public transport must be pursued with respect to actual/perceived risks of infection, especially for vulnerable groups, by defining, monitoring and enforcing behavioural rules such as social distancing, wearing masks, prioritising system-critical groups for certain brief time frames, etc. Organisational strategies for **risk management** that call for the short-term mobilisation (and local authority financing) of all mobility services (taxis, hired vehicles including buses, bus services organised by local communities, car pooling) would be useful. Service enhancements (including vehicle headway, size and organisation) and their significant associated investment and follow-on costs must be discussed when setting policy priorities. However, a prerequisite for the effectiveness of such models is to further reduce the fixation on private vehicles for mobility in normal times so that an effective eco-mobility infrastructure is available for use in the event of a pandemic.

Inner-city development with adequate green and open spaces is a key strategy in urban and regional development that requires relevant metrics, which are currently the subject of much research and political discussion (e.g. Masterplan Stadtnatur, BMU 2019). The actual situation in growing cities and the provision of green spaces for residents in times of climate change and inner-city densification also needs to be considered. The frequently-cited guiding principle of the

‘European city’ should be understood, not only during the pandemic, to mean that appropriate density is always accompanied by green and open spaces that are adequately sized and equipped to fulfil the functions allocated to them. To boost individuals’ ability to adapt, especially for those in vulnerable groups, public spaces should be assessed not only in terms of their aesthetics but also, given the heavier demands the public can be expected to place on them, in terms of their suitability; if necessary, they should be modified because they can help to reduce and compensate for physical and psychological stress related to crowding and climate change. The anti-stress effects of urban green spaces have been proven at the level of biological variables such as stress hormones (Hunter/Gillespie/Chen 2019). In addition to their anti-stress and stress-reducing effects, they enable social contact under physical distancing conditions. Both green spaces and open spaces (squares, pavements, vacant sites, etc.) are essentially places that promote social interaction and the development of social cohesion if they are accepted and used by the public (Holtan/Dieterlen/Sullivan 2014). This means they play an important public health role (Adli/Schöndorf 2020). An objective should be to link these open spaces to improve accessibility and achieve benefits across larger areas. The sites of infrastructure important to society, such as schools, local services and mobility hubs, should also be integrated in these spatial networks.

With these aspects in mind, **strategies for multifunctional areas and recreation areas**, open spaces and spaces on streets that can take on important functions in other crisis situations, such as water retention during heavy rain or floods, should also be considered. These could be created in the form of multiple smaller playgrounds and exercise facilities spread around the city, along streets in particular, as a complement to large, central playgrounds that serve as meeting points and are easily accessible on foot. This requires new location and networking strategies and designs for streets and squares that, at least during a pandemic, can be closed to vehicle traffic and reserved for social activities.

In addition to centralised facilities, of particular importance are the needs-based **neighbourhood facilities and organisational structure** of health-related services (in cooperation with medical facilities such as hospitals and private practices) and the supply of everyday goods and services, but also of schools, care facilities, and mobility services. This applies equally to digital infrastructure and to staff resources and training, as well as to the availability and accessibility of each. Also important to improve the mix of uses are small-scale, locally-focused tradespeople, goods and services integrated in the local economy. By the same token, in cooperation with manufacturing, service and/or retail businesses located close to housing, company housing, company nursery schools and the like can once again be better integrated in neighbourhoods (also in suburbs). Such activities should be coordinated and balanced with requirements and plans for a pandemic-related separation of uses (physical distancing) as a further resilience-promoting component.

Against the backdrop of experience gained from the COVID-19 pandemic, the internal organisation of **emergency and disaster management services** in the broadest sense (fire brigade, the German Federal Agency for Technical Relief (*Technisches Hilfswerk*, THW), emergency medical services, public health services, etc.) will undergo changes aimed at greater flexibility and even faster response capability. Equipment and facilities in the existing infrastructure must be reviewed, interconnected and improved. This could have spatial consequences in the form of new or changed buildings and facilities that will need to be integrated into neighbourhoods/boroughs and connected to digital and traffic networks.

Small-scale data are required in order to successfully manage needs, deficiencies and suggested improvements. The objective must be to agree on **the standards for equipment and facilities** and measures for obtaining them. It is appropriate that small-scale analyses, strategies and measures be carried out by organisations such as local authority, city or district management, who know the local circumstances and also the actors, structures and processes and can deploy them cooperatively. Here, it is also a matter of envisaging models for the physical separation of patients

who are infected or may be infected with SARS-CoV-2 from other patients in order to safeguard general healthcare services. Experience has shown that care homes are particularly sensitive; infection scenarios should be considered during the design phase of such facilities.

Implementation through urban development promotion: Funding from urban development promotion programmes makes a major contribution to integration and is intended to support strategies and measures for strengthening municipal and urban resilience. This applies in particular to the design and, where needed, the refinement of the **Social Cohesion** (*Sozialer Zusammenhalt*) and **Living Centres** (*Lebendige Zentren*) **funding programmes** newly defined in the 2020 administrative agreement on urban development (*Verwaltungsvereinbarung Städtebauförderung* 2020; see https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/themen/bauen/verwaltungsvereinbarung-staedtebaufoerderung-2020.pdf;jsessionid=DE14C5329DDF07C001DF108F3A5A36AE.2_cid287?__blob=publicationFile&v=1). In this context, funds from private initiatives for urban development under section 171f of the Federal Building Code (*Baugesetzbuch, BauGB*) may be used, where appropriate in conjunction with contingency funds under article 9 of the 2020 administrative agreement on urban development, which states that: ‘as a rule, up to 50 per cent of financing for the fund comes from urban development funding, and at least 50 per cent should come from funds from the business community, property and community associations, private individuals, or from additional funding from the local authority’ (translation of the original German quote).

3.2 Recommendations for regional actors

Regions are key action and cooperation areas with regard to social, economic and ecological policies. This is particularly relevant for the intended promotion of a regional supply and care economy / circular economy. ARL position paper 115, ‘*Raumordnung: Anwalt für gleichwertige Lebensverhältnisse und regionale Entwicklung*’ (‘Spatial planning as an advocate for equivalent living conditions and regional development’) makes the point that spatial planning lacks opportunities to participate in the actual implementation of its own planning objectives and guidelines. Regional planning in particular needs more opportunities to participate in the application of spatially-relevant funding instruments. In this context, there should also be an examination of how to support the setting of minimum standards for the centralised provision of instruments for financial equalisation among local authorities in order to support the implementation with the necessary funding (ARL 2020:

Strategic regional planning: The framework for stakeholder- and implementation-oriented regional planning could be provided by integrated regional development strategies and the associated dialogue processes. According to the aforementioned ARL position paper, the development strategy to be drawn up with the regional stakeholders formulates the principal courses of action; these include both organisational instruments, i.e. the objectives and principles of spatial planning, and courses of action that assign responsibilities and identify available resources or funds to be raised. To this end, the regional plan could be augmented with a ‘second volume’ describing the actual implementation alongside the legally binding planning document. This second volume could also show which of the (carefully balanced) spatial planning objectives can be best implemented with which (funding) instrument (ARL 2020: 6; cf. also Vallée 2012).

Coordination and cooperation: This requires intensive, ongoing interdisciplinary coordination, and also voluntary cooperation between local authorities in a wide range of areas (land, energy, mobility/transport, environment, supply, etc.). Cooperation between local authorities can be arranged with public-law contracts, special-purpose associations or local mergers. One instrument for such cooperation is the aforementioned integrated regional development strategies, which should be assessed in terms of pandemic resilience and revised as necessary. Insights gained from such strategies can be incorporated into (legally binding) regional planning. An important example

of this would be establishing maximum limits for the time needed to reach a hospital (see section 3.3). Mobility management measures for existing sites should also establish alternate routes for the people employed there.

Regional planning can make a significant contribution to the **resilience of spatial structures and land uses**. To this end, the notion of spatial risk prevention should be systematically integrated in the spatial observation, risk analyses, weighing processes and spatial planning instruments used in regional planning (BBSR 2020). The current pandemic underlines the urgency of this matter. Findings relating to spatially-relevant impacts of the pandemic should be used to develop and refine the instruments, methods and processes of spatial risk prevention and should be proactively implemented in practical planning.

Regional cooperation can and must be initiated and supported to **improve the provision of public services** as in many parts of Germany adequate goods and services are not (or are no longer) accessible through active mobility. Innovative and flexible alternatives can aid in obtaining goods and services in these areas even during crises; mobile medical practices, community nurse and practice assistant models, mobile supermarkets and banks, and digital connectivity bring goods and services to people while also enhancing **equivalence, risk prevention and public service provision**. Raising people's awareness about local and regional providers of goods and services is just as important as providing suitable physical locations for them. Such services require corresponding financial resources (supported by taxes) and earmarked funding programmes, for example in the context of urban development promotion or the establishment of a new **regional funding programme** to improve the equivalence of living conditions and regional resilience, and they also need to be accepted and used by local people outside of times of crisis. Special consideration must be given here to living arrangements involving multiple regions, for example people who work or study and thus frequently stay at a considerable distance from their regular or permanent residence.

3.3 Recommendations for the federal states

In Germany's federal system of government, the federal states play a crucial role in safeguarding public health while weighing other interests.

Develop scenarios: Few actions have been taken based on parliamentary document 17/12051 of 3 January 2013 entitled *Unterrichtung durch die Bundesregierung – Bericht zur Risikoanalyse im Bevölkerungsschutz* 2012 (Information from the Federal Government– 2012 report on risk analysis in civil protection). The scenario presented in the document anticipated the characteristics and impact of the current SARS-CoV-2 virus, though with a much higher assumed mortality rate. The scenarios should be reviewed based on current experiences, and the conclusions should be adjusted where necessary.

Establish area-wide medical care and healthcare services: Spatial planning regulations such as minimum standards are an instrument that, in the context of the central place system, was increasingly called into question before the pandemic based on supposed or actual economic efficiency aspects. With a reduction in the number of hospitals in favour of high-quality care, strategies should be developed for adapted area-wide medical care and healthcare services, also taking outpatient care into account and making particular use of digital connectivity and online services. Questions of orientation and specialisation in a tiered supply model aimed at accessibility will need to be discussed further while ensuring an adequate supply of goods and services at the different levels and needs-based bundling of services that have previously been available separately.

Define standards for regional facilities: Accordingly, the different standards and requirements for regional facilities should be examined in detail, taking into consideration the standards of the

central place system, and defined accordingly. As municipal infrastructure, hospitals in conjunction with other social and technical infrastructure are a core element that determines not only the type and scope of healthcare available near residential areas but also the jobs available to medical staff. Additional services such as short- and long-term care or spa treatments are another important component of healthcare that can also serve to make a municipality or region attractive to new residents, businesses and service providers. When providers reduce the range of services they offer, this has an impact on the quality of life of local residents, especially those who depend on access to nearby services. It is thus particularly important to take disadvantaged population groups into account, especially when it comes to providing social infrastructure such as educational and care facilities.

Federal state spatial planners should add **health-related risk prevention** to their tools and push for the development of pandemic master plans in cooperation with policymakers in sectors such as transport, logistics and medical services. This goes beyond existing pandemic plans, which for the most part only deal with influenza and are not sufficiently practicable and up to date. Local authorities must be capable of quickly and purposefully adapting master plans to local conditions and requirements as municipal standards to combat epidemics and pandemics. As part of spatial planning's coordinating responsibility for multi-level access in spatially-relevant plans and measures (according to section 7(4) of the Federal Spatial Planning Act), the extent to which it is possible to provide the hospitals called for in central-place theory and to maintain reserve capacity (analogous to the reserve power plants for securing the energy supply) should be examined. Corresponding strategies should be developed, examined and incorporated into the central place strategy in the federal state development plans.

Medical care and healthcare services as part of regional development: This also includes a link-up with social infrastructure and the (minimum) quality standards to be pursued in the various types of settlements and spaces and also with the development of schools and care facilities for seniors as a key component of local quality of life.

Support regional governance and coordination: Spatial planners and health policymakers should consult among themselves and cooperate with the appropriate actors from the public health services, the Association of Statutory Health Insurance Physicians, inpatient and outpatient care providers, and charities. Any shortcomings and needs in this regard, including those with relevance beyond the pandemic, should be addressed so the actors can make their concerns heard. It is desirable that the various service providers be connected, including digital and transport services; all actors from these areas should also be involved. The establishment of a spatially representative network encompassing all of the aforementioned actors is called for in order to enable quick responses to crises and to prevent risks. This can also include temporary sentinel practices (doctor's surgeries in a research programme to monitor acute respiratory disorders) that voluntarily participate in epidemiological surveillance campaigns and can also serve as potential locations for on-site professional training to inform and equip outpatient physicians, including those working in peripheral rural areas.

Spatially differentiated data availability and data standards for long-term risk prevention should also be established at the federal state level as part of spatial observation activities (see also section 3.1).

Border regions: Open borders are indispensable to any cross-border cooperation. Should border closures nevertheless become necessary to fight the pandemic, coordination routines for rapid and concerted cross-border action need to be developed (cross-border cooperation according to section 24 of the Federal Spatial Planning Act). Relevant experience can be gained in the metropolitan border regions of European countries (for example, the Meuse-Rhine Euroregion, Saar-Lor-Lux, Upper Rhine, Regio Basiliensis, Lake Constance), and cooperative strategies and measures can be developed. The same applies to predominantly rural cooperation areas (for example, Interreg V-A, the Austria-Hungary border area).

3.4 Recommendations for the federal government

Spatial planning needs to develop routines that systematically integrate pandemic and critical infrastructure considerations in its own instruments and in spatial observation activities (including across borders). Institutional anchoring and support is welcome in principle (BBK 2020). Risk analysis, including that of critical infrastructure, has thus far been sectoral and appears not to reach the necessary scope. On the whole, risk management and critical infrastructure remain niche issues in spatial planning (BBSR 2020).

Amend the Federal Spatial Planning Act: To change this situation, a reformulation of section 2(2) no. 7 of the Federal Spatial Planning Act is proposed, to stipulate that the spatial requirements of defence, civil protection and health protection must be accommodated. The addition of ‘health protection’ (which, like all principles of spatial planning, should be weighed at all levels of planning) gives greater weight to the handling of spatial requirements in the context of a pandemic, for example when securing hospital sites in federal state development plans and regional plans in the context of central places. Analogously, in the federal government’s current spatial planning activity – the draft of the federal spatial plan for flood protection (section 17(2) of the Federal Spatial Planning Act) – the weighing of interests has to consider how critical infrastructure will work when both challenges – flooding and pandemic – coincide in space and time. Here one could think of a further plan with principles for concretising section 2 of the Federal Spatial Planning Act in the sense of section 17(3) of the Federal Spatial Planning Act, which would already be possible under current law and could set nationwide weighing standards.

The following **cross-department approaches** are also needed so that spatial planning can contribute its integrative perspective:

- > a systematic analysis of the effects of the pandemic (including long-term effects) on spatial development (including on critical infrastructure);
- > a systematic analysis of the vulnerability of society, land, the economy, and critical infrastructure in a pandemic;
- > the development of scenarios for different ways in which a pandemic might occur (duration, dynamics of new infections, mortality, spreading, people at risk, etc.) and for the potential long-term effects (including *worst case scenarios*) in spatial development;
- > a systematic analysis of the need to adapt sectoral federal regulations such as the road traffic laws (*Straßenverkehrs-Ordnung*) or the Carriage of Passengers Act (*Personenbeförderungsgesetz*) (see section 3.1).

Equivalent living conditions as a national objective: A German government paper based on the recommendations of the committee on equivalent living conditions entitled *Unser Plan für Deutschland – Gleichwertige Lebensverhältnisse überall* (Our plan for Germany – equivalent living conditions everywhere, BMI 2019) includes a proposal to anchor equivalent living conditions in the Basic Law as a government policy objective. In view of the COVID-19 pandemic, this objective should also be more explicitly anchored in a future revision of the 2016 ‘Concepts and Strategies for Spatial Development in Germany’, for example.

Spatial development funding programme analogous to urban development promotion: Beyond a helpful reform of the system for equalising local authority finances and the required meta-analysis of funding, the demands of the committee on equivalent living conditions should be concretised in a new nationwide spatial development funding programme to specify, for example, that the available capacity of hospital infrastructure in the central-place system should not be allowed to fall below a certain threshold of performance and availability during a pandemic

(minimum standards, see above). This should be formulated as a prerequisite for funding. Investments to ensure mobility in structurally weak areas and sufficiently resourced rescue services in rural areas could be objectives of such funding. Analogous to urban development promotion as a form of federal financial assistance based on article 104b of the Basic Law, the spatial development funding programme could be funded through an administrative agreement between the federal government and the federal states and offer flexibility and independent implementation for the regions in particular (cf. also ARL 2020).

Spatial observation should be supplemented with research programmes on the spatial effects of pandemics, and the Federal Institute for Research on Building, Urban Affairs and Spatial Development (*Bundesinstitut für Bau-, Stadt- und Raumforschung, BBSR*) should be provided with the necessary staffing and funding, if necessary also for cooperation with the Robert Koch Institute.

3.5 Recommendations at the European level

Pandemics like COVID-19 transcend political and administrative boundaries, so coping with them requires international cooperation at national as well as regional and local levels since lifestyles and economic processes are increasingly organised across national borders.

European documents: Attempts to further develop and build on the Territorial Agenda and the Leipzig Charter following the German presidency of the European Council in 2020 will need to explicitly address large-scale trends and threats like the COVID-19 pandemic, or the effects of climate change and strategies for dealing with it. Thus the objectives, concepts and implementation strategies for sustainable, balanced European spatial development need above all to include aspects of social justice and spatial equity; vulnerability; the resilience of spatial structures and social and technical infrastructures (e.g. those of healthcare, transport, energy and information systems in trans-European networks and systems for locating sites); coping with the effects of climate change; and health protection. With its ideas for a fairer and greener Europe, Territorial Agenda 2030 looks at ways to move from crisis management to preventive planning and formulates them as its core aims.

European spatial observation: The member states should engage in timely, proactive and comprehensive discussions to coordinate strategies, plans and measures for dealing with pandemics and climate change. Spatial observations at the European level are an important basis for this and should therefore be refined in European model projects based on existing data and maps.

Multilevel approach: Both pandemics and climate change have impacts across national borders, but also across regions and municipalities of neighbouring countries. Observations and the analysis and solution of problems call above all for the exchange of information, the coordination of strategy and planning, and the harmonisation of measures and their implementation. This means territorial subdivisions of individual countries (e.g. federal states, departments, regions or municipalities) may also need to be authorised, possibly via international treaties, to cooperate directly. However, direct intervention in regions or municipalities by the European Commission should be avoided in keeping with the principle of subsidiarity. That would strengthen both the subsidiarity principle and the municipalities' capacity to act. Problem-tracking and problem-solving are coordinated within this multilevel governance system.

APPENDIX

Observations in the crisis

The following statements are based on initial observations of the spatially-relevant effects of the current COVID-19 pandemic, which point to the following aspects and tendencies in **urban regions and metropolitan areas**:

- > More space is needed for *housing* in view of the potential permanence of the labour shift from predominantly inner-city locations to private homes (working from home) (30% of jobs according to estimates; cf. EY/Wuppertal Institut für Klima, Umwelt, Energie 2020) or for co-working/teaching/learning spaces as part of the provision of public services.
- > *Stationary retail trade vs. online retail*: There is a worsening stationary retail crisis in inner city locations, endangering the urbanity and vitality of inner cities, town centres and urban borough centres, also in view of the increasingly hybrid nature of business models and supply relationships and the concurrent growth of large-scale online retail (logistics centres, warehouses, etc.) in peripheral locations.
- > *Production and services*: The COVID-19 pandemic could strengthen the trend towards a return to urban production (less mass production than workshop-level production or prototype development) in the cities, with places of residence, work, leisure and urban culture overlapping (cf. Libbe/Wagner-Endres 2019; Bathen/Bunse/Gärtner et al. 2019).
- > *Safeguarding open spaces vs. inner city densification*: The tension between protecting open spaces and greater densification is intensifying and is system-critical not only in view of climate change adaptation but also due to the social dimension of urban open and green spaces in their function as spaces for social interaction and exercise. How they are designed affects social behaviour, emotional well-being and mental health. City residents are especially exposed to social stressors, including social density (perceived as uncontrollable) and social isolation (Adli/Berger/Brakemeier et al. 2017). Epidemiological data show an increased incidence of various mainly stress-related mental illnesses in the Global North (Peen/Schoevers/Beekman et al. 2010; Pedersen/Mortensen 2001): depression, anxiety disorders and schizophrenia (Adli/Schöndorf 2020). A general increase in these stressors can be expected during the pandemic. The substantial decrease in social activities can lead to an increased risk of isolation and subjective loneliness; particularly affected are those who live alone, comprising nearly one-third of city dwellers in Germany.
- > The need for physical distancing complicates social interactions, social support processes and the perception and experience of social cohesion (Smith/Lim 2020); an increase in exposure to social stresses can be expected. The extent to which this will result in an increased incidence of mental illness remains to be seen. Individuals with a previous history of mental illness have higher vulnerability.
- > *Transport and mobility*: The transport sector is considered critical infrastructure that can also impact other critical infrastructure (such as healthcare, education or energy) and lead to supply bottlenecks (e.g. food supply). It is questionable whether the strong short-term decrease in distance driven (cf. infas/Motiontag 2020) will last, and whether temporary additional spaces for cycling (pop-up cycling paths) to redistribute transport areas in favour of non-motorised transport will become permanent or also, as shown by the RS 1 supra-regional cycling highway in the Ruhr area, be planned more often. During the pandemic, the model of the compact European city has shown its strengths in the local provision of goods and services and recreational choices, but also its weaknesses, such as the lack of publicly accessible open spaces.

- > The *real estate sector* exhibits a spatially uneven distribution of the effects of insolvencies and vacancies in different segments of the real estate market (ground floor zones and shops). In view of the strong trend towards working from home, a decrease in office space can be expected. The potential for the conversion of office space to support the housing market may point to a need for efforts to promote urban development.

In **rural areas**, new opportunities are emerging alongside known challenges. Rural areas are sometimes perceived as safe havens or even ‘pandemic refuges’ (cf. Simmank/Vogel 2020), although they also have high infection rates during the ‘second wave’ and a limited density of medical infrastructure in terms of doctors and hospitals.

- > *Accessibility and mobility*: Previously known problems with the accessibility of facilities providing public services (particularly medical care and commuter traffic based on public transport) became more apparent in peripheral rural areas. A sharp decrease in demand for public transport at the beginning of the pandemic strained its already limited economic viability.
- > The same is true of the *decentralised infrastructure for in-person service* at retail businesses, schools and healthcare facilities; digital technology can improve its accessibility but cannot fully compensate for its spatial dispersion. Decentralised cooperative strategies will still be needed.
- > The drastic downturn in *tourism* has a regional and economic impact at all levels. Generally lower demand for international leisure travel stands in contrast to the high demand in domestic tourist destinations, whereby significant regional disparities can be observed. Business and conference travel, on the other hand, has nearly come to a standstill, especially in the cities. According to recent data from DEHOGA, a German interest group, more than half of Germany’s hotels and restaurants are facing serious financial difficulties (<https://www.kompetenzzentrum-tourismus.de/wissen/zahlen-und-fakten>). The effects of the pandemic could lead to a considerable decrease in tourism offerings, particularly in rural peripheral areas, with far-reaching regional economic consequences.

Other spatial structure types such as the regions around agglomerations or peripheral rural areas have their own special but structurally similar problems.

In **discussions among local health care actors** from inpatient and outpatient care, public health services and the care sector, suitable measures to combat the pandemic were considered in the individual districts and urban districts, mostly in the form of cooperative collaboration with an openness toward recommendations from other actors. Federalism in Germany enabled the development of new structures with the aim of quickly reaching a consensus on measures to be taken in the crisis.

In the current pandemic, the integration of transport services for patients and outpatient services as well as digital monitoring and care services is emerging as an especially crucial factor in ensuring the spatially equitable distribution of **healthcare**. However, safeguarding the provision of such services must be guaranteed in general and not merely in an acute pandemic situation.

If the pandemic is largely contained, there will be no general overloading of hospital infrastructure. Local outbreaks that can lead to major regional divergences in infection rates will remain a crucial issue.

Socio-spatial and environmental disparities are being revealed by the increased visibility of old and new inequalities, and not only during lockdowns. Both can have a more severe impact on low-income or otherwise vulnerable groups, or on those suffering from illnesses caused by previous

conditions. Disadvantaged municipalities, urban boroughs and neighbourhoods that were already in need of special support before the pandemic will need assistance (increased support for neighbourhood management, child and youth work, etc.) even more urgently. Initial analyses of COVID-19 morbidity and mortality rates (Chen/Krieger 2021) show social inequalities at the district level. The classification of countries, cities and districts or individual municipalities as risk areas can suddenly turn a territorially delineated administrative unit into a very confining ‘bell jar’ for those living there. Living and working spaces that cross European national borders with all their enmeshed interconnections were effectively spliced up and sealed off from each other from one day to the next, putting to the test the European identity that had developed up to that point.

With regard to **spatial development**, the question arises of whether and which temporary changes in the organisation of spaces and areas during the lockdowns have proven so useful that their permanent continuation should be discussed. New working and living arrangements are emerging, with spatial and infrastructural implications. Likewise, the pandemic is leading to a restructuring of retail trade, including large-scale infrastructure for online retail (logistics centres, warehouses, etc.), and this will pose major challenges for spatial planning. It will be particularly important to guarantee the accessibility of facilities for providing at least a minimum level of goods and services and to avoid the exacerbation of disparities in equivalence.

References

- Adli, M.; Berger, M.; Brakemeier, E.-L.; Engel, L.; Fingerhut, J.; Gomez-Carrillo, A.; Hehl, R.; Heinz, A.; Mayer, J.; Mehran, N.; Tolaas, S.; Walter, H.; Weiland, U.; Stollmann, J. (2017): Neurourbanism: towards a new discipline. In: *The Lancet Psychiatry* 4 (3), 183-185.
- Adli, M.; Schöndorf, J. (2020): Macht uns die Stadt krank? Wirkung von Stadtstress auf Emotionen, Verhalten und psychische Gesundheit. In: *Bundesgesundheitsblatt – Gesundheitsforschung – Gesundheitsschutz* 63 (8), 979-986.
- ARL – Academy for Territorial Development in the Leibniz Association (ed.) (2020): *Raumordnung: Anwalt für gleichwertige Lebensverhältnisse und regionale Entwicklung – eine Positionsbestimmung*. Hanover. = Positionspapier aus der ARL 115.
- Bathen, A.; Bunse, J.; Gärtner, S.; Meyer, K.; Lindner, A.; Schambelon, S.; Schonlau, M.; Westhoff, S. (2019): *Handbuch Urbane Produktion: Potenziale, Wege, Maßnahmen*. Bochum.
- Baumgart, S.; Köckler, H.; Ritzinger, A.; Rüdiger, A. (2018): *Planung für gesundheitsfördernde Städte*. Hanover. = Forschungsberichte der ARL 8.
- BBK – Federal Office for Civil Protection and Disaster Assistance (ed.) (2020): *10 Jahre „KRITIS-Strategie“*. Einblicke in die Umsetzung der Nationalen Strategie zum Schutz Kritischer Infrastrukturen. Bonn.
- BBSR – Federal Institute for Research on Building, Urban Affairs and Spatial Development (ed.) (2020): *Vorsorgendes Risikomanagement in der Regionalplanung. Handlungshilfe für die Regionalplanung*. Bonn.
- BMI – Federal Ministry of the Interior (ed.) (2019): *Unser Plan für Deutschland – Gleichwertige Lebensverhältnisse überall*. Berlin.
- BMU – Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (ed.) (2019): *Masterplan Stadtnatur. Maßnahmenprogramm der Bundesregierung für eine lebendige Stadt*. Berlin.
- Böhm, K.; Bräunling, S.; Geene, R.; Köckler, H. (ed.) (2020): *Gesundheit als gesamtgesellschaftliche Aufgabe. Das Konzept Health in All Policies und seine Umsetzung in Deutschland*. Wiesbaden.
- Bole, G.; Bunge, C.; Hornberg, C.; Köckler, H. (2018): Umweltgerechtigkeit als Ansatz zur Verringerung sozialer Ungleichheiten bei Umwelt und Gesundheit. In: *Bundesgesundheitsblatt – Gesundheitsforschung – Gesundheitsschutz* 61 (6), 674-683.
- Chen, J. T.; Krieger, N. (2021): Revealing the unequal burden of COVID-19 by income, race/ethnicity, and household crowding: US county vs ZIP code analyses. In: *Journal of Public Health Management and Practice* 27 (1), 43-56.
- German Federal Parliament (ed.) (2013): *Unterrichtung durch die Bundesregierung – Bericht zur Risikoanalyse im Bevölkerungsschutz 2012*. Document 17/12051. Berlin.
- EY – Ernst & Young; Wuppertal Institut für Klima, Umwelt, Energie (eds.) (2020): *Zwischenbilanz COVID-19: Umweltpolitik und Digitalisierung*. https://www.wupperinst.org/fa/redaktion/downloads/publications/COVID-19_Umwelt_Digitalisierung.pdf (12 June 2020).
- Freier, R.; René, G. (2020): Kommunale Finanzen in der Corona-Krise: Effekte und Reaktionen. In: *Wirtschaftsdienst* 100 (5), 356-363. <https://www.wirtschaftsdienst.eu/inhalt/jahr/2020/heft/5/beitrag/kommunale-finanzen-in-der-corona-krise-effekte-und-reaktionen.html> (05.08.2020).
- Holtan, M. T.; Dieterlen, S. L.; Sullivan, W. C. (2014): Social Life Under Cover: Tree Canopy and Social Capital in Baltimore, Maryland. In: *Environment and Behavior* 47 (5), 502-525.

- Hunter, M. R.; Gillespie, B. W.; Chen, S. Y. (2019): Urban Nature Experiences Reduce Stress in the Context of Daily Life Based on Salivary Biomarkers. In: *Frontiers in Psychology* 10, 722.
- infas Institute for Applied Social Sciences; Motiontag (2020): Alles anders oder nicht? Unsere Alltagsmobilität in der Zeit von Ausgangsbeschränkung oder Quarantäne. = Trackingreport 03.
https://www.infas.de/fileadmin/user_upload/infas_mobility_CoronaTracking_Nr.03_20200513.pdf (26 May 2020).
- Köckler, H.; Sieber, R. (2020): Die Stadt als gesunder Lebensort?! Stadtentwicklung als Politikfeld für Gesundheit. In: *Bundesgesundheitsblatt – Gesundheitsforschung – Gesundheitsschutz* 63 (8), 928-935.
- Libbe, J.; Wagner-Endres, S. (2019): Urbane Produktion in der Zukunftsstadt. Perspektiven für Forschung und Praxis. Berlin. = Synthese Paper * Nr. 1, Zukunftsstadt und urbane Transformation – SynVer*Z.
https://www.nachhaltige-zukunftsstadt.de/downloads/Synthese_Paper_Urbane_Produktion.pdf (27 October 2020).
- Pedersen, C. B.; Mortensen, P. B. (2001): Evidence of a Dose-Response Relationship Between Urbanicity During Upbringing and Schizophrenia Risk. In: *Arch Gen Psychiatry* 58 (11), 1039-1046.
- Peen, J.; Schoevers, R. A.; Beekman, A. T.; Dekker, J. (2010): The current status of urban-rural differences in psychiatric disorders. In: *Acta Psychiatrica Scandinavica* 121 (2), 84-93.
- Simman, M.; Vogel, B. (2020): Städte halten den Atem an, Dörfer atmen tief durch. Corona auf dem Land: Soziologische Momentaufnahmen.
http://www.sofi-goettingen.de/fileadmin/Maie_Simman/SOFI_Corona_auf_dem_Land.pdf (26 May 2020).
- Smith, B. J.; Lim, M. H. (2020): How the COVID-19 pandemic is focusing attention on loneliness and social isolation. In: *Public health research & practice* 30 (2), 3022008.
<https://pubmed.ncbi.nlm.nih.gov/32601651/> (27 October 2020).
- Vallée, D. (ed.) (2012): Strategische Regionalplanung. Hanover. = Forschungs- und Sitzungsberichte der ARL 237.
- Völker, S. (2020): Stellen geographische Methoden eine gerechte und effiziente Gesundheitsversorgung während einer Pandemie sicher? Covid-19 als Zäsur.
https://wp.med-geo.de/wp-content/uploads/2020/10/COVID19-Zaesus_Beitrag_Voelker.pdf (09 October 2020).

Additional literature

Competence Network Public Health COVID-19: <https://www.public-health-covid19.de/>
 e.g. Hintergrundpapier: Auswirkungen von Infektionsschutzmaßnahmen im Bereich Umwelt und Gesundheit
https://www.public-health-covid19.de/images/2020/Ergebnisse/Infektionsschutzmaßnahmen_und_umweltbezogene_Gesundheit_FINAL2.pdf (06 January 2021).

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Position paper from the 'Pandemic and Spatial Development' Ad hoc Working Group at the ARL. Hanover, 2022.

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01370>

136 Raumwirksamkeit der Digitalisierung.

Positionspapier aus der AG „Raumwirksamkeit der Digitalisierung“ der Landesarbeitsgemeinschaft (LAG) Baden- Württemberg der ARL. Hannover, 2022.

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01362>

135 Braunkohlenplanung, Strukturwandel und Kohleausstieg in Deutschland.

Positionspapier von Mitgliedern des Informations- und Initiativkreises (IIK) „Braunkohlenplanung“ der ARL. Hannover, 2022.

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01353>

134 Regionalplanung für einen raumverträglichen Ausbau von Freiflächen-Photovoltaikanlagen (FPV).

Positionspapier aus der AG „Freiflächen-Photovoltaikanlagen (FPV)“ des Informations- und Initiativkreises (IIK) Regionalplanung der ARL. Hannover, 2022.

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01342>

133 Safeguarding open spaces in the Alpine region.

Position paper by a group of members of the 'AlpPlan' Alpine spatial planning network at the ARL. Hanover, 2022

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01339>

132 Ländliche Räume in NRW – Räume mit Zukunftsperspektiven – Schwerpunktthema „Daseinsvorsorge“ – Teil-Positionspapier 4.

Positionspapier aus der AG „Zukunftsperspektiven ländlicher Räume in NRW“ der Landesarbeitsgemeinschaft (LAG) Nordrhein-Westfalen der ARL. Hannover, 2022.

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01325>

131 Ländliche Räume in NRW – Räume mit Zukunftsperspektiven – Schwerpunktthema „Bürgerschaftliches Engagement und Ehrenamt“ – Teil-Positionspapier 3.

Positionspapier aus der AG „Zukunftsperspektiven ländlicher Räume in NRW“ der Landesarbeitsgemeinschaft (LAG) Nordrhein-Westfalen der ARL. Hannover, 2022.

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01317>

130 Ländliche Räume in NRW – Räume mit Zukunftsperspektiven – Schwerpunktthema „Wohn- und Siedlungsentwicklung“ – Teil-Positionspapier 2.

Positionspapier aus der AG „Zukunftsperspektiven ländlicher Räume in NRW“ der Landesarbeitsgemeinschaft (LAG) Nordrhein-Westfalen der ARL. Hannover, 2022.

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01302>

129 Ländliche Räume in NRW – Räume mit Zukunftsperspektiven – Schwerpunktthema „Wirtschaft und Arbeit“ – Teil-Positionspapier 1.

Positionspapier aus der AG „Zukunftsperspektiven ländlicher Räume in NRW“ der Landesarbeitsgemeinschaft (LAG) Nordrhein-Westfalen der ARL. Hannover, 2022.

URN: <https://nbn-resolving.org/urn:nbn:de:0156-01290>

