Research Paper

Urban design after the pandemic

Tugce TEZER[i], Mimar Sinan Fine Arts University, Turkey

Abstract

The Anthropocene era requires us to rethink human life and the cities where most of it takes place -and our responsibility in this regard. In addition to new experiences, the pandemic experiences of the world throughout history, and the methods that have been developed by humankind to deal with them are undoubtedly guiding today's urban planners. The issue of how to design our cities in the future so that public spaces are safe, livable, and accessible emerges if we describe the current era as an "age of pandemics". Since 2020, a lot of research has been done in the fields of planning and social sciences to define, examine, and suggest solutions, as well as a variety of urban practices, particularly in public spaces, in various cities across the world. New approaches in the social, economic, and physical fields are required to address the set of crises that the growth-oriented approach, of which the pandemic is one interface, has brought to the world. In this research, particular academic fields are used to identify public space and urban design approaches, the pandemic, and COVID-19. Then, by examining the practices in different cities around the world, changes in the field of urban design and public space after the pandemic are discussed to support the answer to the issue above.

Keywords

Pandemic, Urban Design, Public Space, COVID-19, City

1. Scope of the research

Many concerns in the field of social sciences and planning have been reexamined because of the pandemic period we are presently in, raising questions on many conventional ideas. An inevitable "age of crises" has begun because of the alteration in humanity's interaction with nature, as well as the change in production techniques, lifestyles, and priorities. Numerous research has been conducted over the past two years on COVID-19, which some experts believe is the start of the pandemics that will occur regularly in the future. Contrary to the common tendency, this research prefers to define the pandemic period not as a period that has come and gone, but as our way of life from now on. Based on this assumption, it defines the responsibility of urban design today as a change of perspective and approach beyond the practical interventions to be made during the pandemic.

Research in the field of planning concerning the pandemic has mainly focused on issues such as urban resilience, public space, healthy city, quality of life, accessibility, urban green spaces, ... Contrarily, this study uses the following question as an ignition, which was posed in the report on the COVID-19 process that appeared on BBC Future at the beginning of the pandemic: "If we have indeed entered an era of pandemics, how might we design the cities of tomorrow so that the outdoors doesn't become a no-go zone, but remains a safe and habitable space?" (Constable, 2020). The broad perspective of the question (not limited to COVID-19), the fact that the phrase "cities of tomorrow" evokes a paradigm shift, and the way it is asked reminds people of their responsibilities in this new design process support the objectives

of this research. Furthermore, this research explores the conceptual and practical changes in the relationship between urban design and public spaces during and “after” the pandemic.

This paper consists of three parts and aims to evaluate post-pandemic urban design in light of literature and practice reviews. Following an explanation of the targets and parameters of the study in the introduction section, the first section includes the fundamental concepts that establish the basis of the research and an evaluation of the literature on these ideas, and the second section includes a section that examines the relationship between urban design, public space, and pandemic in the context of both past and present practices, and the third and final section includes conclusions and an evaluation of the study.

1.1. Recognizing the pandemic and urban design

The first concept is the "Anthropocene epoch/era", defined as "an informal geological unit of time used to describe the most recent period in Earth's history when human activities began to have a significant impact on the planet's climate and ecosystems". Within the Holocene epoch, which officially began 11,700 years ago, they needed an unofficial geological epoch to name "the latest period in Earth's history when human activities began to have a significant impact on the planet's climate and ecosystems", but the concept has not yet been approved by the International Union of Geological Sciences (National Geographic Society, 2022). The concept is important in that it emphasizes the role of human beings in positive and negative situations that occur on earth.

The second concept is “pandemic”, which has acquired widespread recognition, especially following the year 2000. A pandemic is the worldwide spread of a newly discovered disease. A new version of influenza or COVID-19 are examples. What distinguishes a pandemic from an epidemic is the extent of the spread of the disease; in an epidemic, there may be more cases of the disease than usual in a community or region, whereas in a pandemic, it is the extent of the spread of the disease that matters. The World Health Organization (WHO) oversees announcing worldwide pandemics when they occur (*healthdirect*, 2022). Factors such as increased infectiousness of the agent, person-to-person transmission of the disease and contemporary modes of transportation like air travel all contribute to the spread of a (infectious) disease (Rogers, 2022).

The infectious disease called COVID-19 (coronavirus disease) causes serious illness and, in rare cases, death in people with various physical health problems, regardless of age group. It causes mild to moderate respiratory illness in most people. Governments and health groups around the world are developing and organizing strategies to prevent and slow the spread of the disease (Rogers, 2022). The first case of this novel coronavirus was detected in Wuhan, China on December 1, 2019 and is believed to have started in an animal and mutated to infect humans (John Hopkins Medicine, 2022).

Urban planning is the process of coming up with ideas that seek to enhance or re-functionalize an existing urban area. Its main goal is to decide what steps will be made in the areas of accessibility, security, transportation, and the environment. Being a multidisciplinary activity is a crucial aspect of planning (Ghisleni, 2022). Urban planning is a field of study which aims to regulate the spatial relationships between different levels of governance. It addresses how setting geographic borders and influencing the geographical distribution of resources has an impact on social, economic, and environmental issues (Huxley and Inch, 2020).

The fields of planning, architecture, landscape architecture, engineering, economics, and law are the main disciplines that contribute to the field of urban design, triggered by the problems caused by the agglomeration and concentration effect of cities and especially the industrial city. The scale of urban design varies from the macro scale, which includes planning and zoning, to the micro-scale, which includes street furniture and lighting. Urban design can only be functional if it is integrated into policy and

planning systems. It has an impact on a region's socioeconomic structure, natural ecosystem balance, and sustainability results, as well as on people's health and the social and cultural fabric of the area. Urban design should be seen as a “long-term process that continues to evolve” even if it is generally associated with a final product called a “project”. (Creating Places for People, 2015). Another definition states that urban design describes the physical features that define the character or image of a street, neighborhood, community, or the city as a whole. Establishing the visual and sensory linkages between the constructed and natural environments is the focus of this field. Buildings and streets are considered to be part of the constructed environment, whereas parks and coastal regions are considered to be part of the natural environment (City of San Diego General Plan, 2008).

Public space is the final conceptual term that was used in this research to demonstrate the link between pandemic and urban design. The urban environment's core element is public space, which serves as a hub for the emergence of public life. Concerns over the decrease of public services and the privatization of the urban environment have been raised since the 1970s as the role of the state has changed (Madanipour, 2015). The primary role of public spaces is political communication with the public at large. To ensure the issue of “publicness”, it is essential to include all social groups. There is concern that current tendencies in the ownership, management, and surveillance of public places threaten such areas' “public” nature (Collins and Shantz, 2009). The main topics of discussion in the current public space debates are “relations of inclusion and exclusion for different social groups; gentrification, urban redevelopment, and corporatization; protest and resistance; the role of public space in shaping relations of gender, race, and disability; and the function of public space in the struggle for urban rights” (Mitchell and Staeheli, 2009). The state-capital influence on the shaping of public space, which has increased especially in the last few decades, is another aspect that needs to be evaluated.

1.2. Literature review on main concepts

It's time to initiate a quantitative evaluation of the academic studies that have been done on these ideas and the binary concept sets after identifying the fundamental concepts on which the study is built. The World Health Organization and Google Scholar databases were used for this research.

Although it has only been more than two years, there are over 450 thousand publications in the WHO’s database on COVID-19 and over 340.000 publications on the pandemic which is a relatively more comprehensive concept; publications on pandemic-urban and COVID-19-urban remain at a very low level compared to publications on the relationship between the pandemic and health (10-12 thousand), but publications on the relationship between urban and a pandemic are well above the number of publications on pandemic-rural and COVID-19-rural (~1600). While there are about 4 million publications on the pandemic, there are over 4.700.000 publications on COVID-19 in Google Scholar's database, which has a broader coverage of publications than the World Health Organization's database, particularly in terms of urban research. While there are over 1.100.000 articles on the pandemic in this database, there are around 2.300.000 publications on COVID-19. While the publications on pandemic-urban design and pandemic-COVID-19, which are the subject of the research, are around 1000 in the WHO database, this number is around between 390-730 thousand in the Google Scholar database. On the other hand, the publications covering pandemic-public space and COVID-19-public space, which are also examined within the scope of this research, are in the range of 1500-1800 in the WHO database, whereas it is between 470-850 thousand in the Google Scholar database.

Table 1. Literature review: Number of publications on key concepts. Source: World Health Organization and Google Scholar databases (Access: 27.08.2022)

Concept (sets)	World Health Organization	Google Scholar
Pandemic	340.694	3.970.000
Epidemic	189.866	2.830.000
COVID-19	454.869	4.740.000
Urban planning	982	4.320.000
Urban design	1.353	4.600.000
Public space	2.025	4.460.000
Pandemic & Urban planning	695	239.000
COVID-19 & Urban planning	808	339.000
Pandemic & Urban design	1.007	387.000
COVID-19 & Urban design	1.171	732.000
Pandemic & Public space	1.573	474.000
COVID-19 & Public space	1.786	850.000
Pandemic & City	10.072	1.140.000
COVID-19 & City	12.999	2.270.000
Pandemic & Rural	1.647	777.000
COVID 19 & Rural	1.673	901.000

Urban design has gained great importance with the novel pandemic. The importance of making public spaces safe, hygienic, and balanced between physical distance and human interaction has increased. Materials used in urban design, "modular building" systems, adaptation of digital technologies to urban spaces and more equal and inclusive distribution of public spaces are predicted to shape the future of urban design in the pandemic impact. In following sections, the conceptual and practical recommendations outlined here are explained in more detail.

2. Establishing the relationship between pandemic and urban design

This section attempts to establish the relationship between the pandemic and the field of urban design at different levels; pandemic experiences from the past to the present, new concepts that have come to the agenda with the novel pandemic, and different practices of the pandemic and urban design.

2.1. Pandemics from past to present

This section of the paper aims to provide an overview of the major pandemic experiences in history, including when, why, and where they occurred throughout the world, as well as how people dealt with them. The assessment of the similarities between these experiences in various historical eras, their impacts on urban space, and newly created conceptual methods is also another goal of this part.

The Black Death (Plague) was an epidemic that was particularly effective in Europe between 1347 and 1351, causing proportionally more casualties (approximately 25 million people) than any known epidemic or war up to that time. The disease is thought to have been transmitted from rodents to humans by flea bites. Originating in China in the 1300s, the disease spread to the Mediterranean, Europe, and North Africa (Augustyn, 2022). The Spanish Flu (1918-1919) pandemic was the most severe influenza pandemic of the 20th century and is known to have spread from ports to Europe and then worldwide. Different research suggests that it caused around 25 million - 50 million deaths (Rogers, 2022a). Cholera is a disease that spreads over a much longer period than other pandemics and has been known to cause mass deaths 7 times in history. This paper focuses on the experience of the global spread of cholera in 1817. The number of deaths caused by cholera, which is known to have spread through trade routes and affected a large part of the world in this period, is not known exactly (Claeson and Waldman, 2022). Swine flu is a respiratory disease of pigs caused by an influenza virus and has been active at different intervals from the 1930s to the 1990s. The most recent swine flu, which occurred in 2009, caused the

deaths of approximately 30-50 thousand people, although there are different data in various sources (Rogers, 2022b).

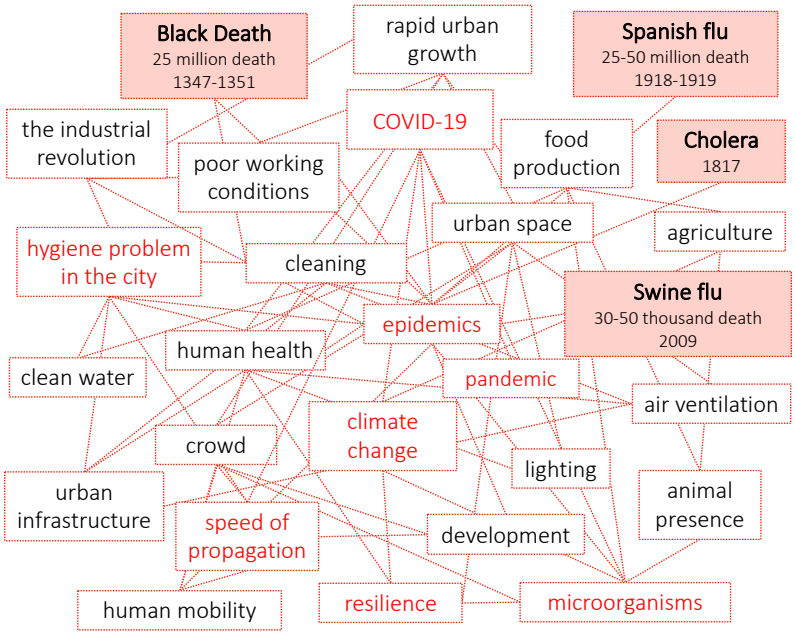

Figure 1. Pandemics from past to present. Source: Tezer, 2022

The diagram above demonstrates a relational analysis of the causes of the pandemics, which are notable in history for the scope of their effects and the number of deaths they have caused, the solutions produced to prevent the spread, and the interventions in urban space. It is seen that all of them are associated with rapid urbanization and urban hygiene problems, while the effects of the industrial revolution, poor working conditions, unhealthy drinking water, crowded urban spaces, poor urban infrastructure, and ventilation problems constitute other causes. On the other hand, “human mobility” is the common reason that accelerates the spread of all of them. Healthy food production, clean drinking water, ventilation, clean food production, and cleanliness come to the fore in common solution suggestions. The COVID-19 pandemic appears to be related to rapid urbanization as well as issues with urban hygiene, climate change, urban resilience, human mobility, and microorganisms.

The COVID-19 pandemic began to have an influence on the planet at the end of 2019 and is still having an impact today. Below are statistics from the World Health Organization's regularly provided data indicating the current total number of cases and deaths for the world and Europe (World Health Organization Database, 2022).

Table 2. Current data on the COVID-19 pandemic. Source: World Health Organization Database, 2022

COVID-19 pandemic	Cases	Deaths
Cases in Europe	246.729.836	2.071.217
Global scale	595.219.966	6.453.458

2.2. Concepts related to pandemic

COVID-19 is not only related to concepts developed through other pandemic experiences in history, but also brings up some new concepts in social sciences and urban studies all over the world for more than two years. In the diagram below, these two categories of concepts are expressed in different colors. While in all pandemics, which are epidemics that spread on a global scale, there is a tension between individual-society, urban-rural-nature, testing, and vaccine discovery with the involvement of the medical

field, social equality, awareness, politics, and working life; with the COVID-19 pandemic, the discussion field is discussed more on the “new normal”, social segregation, climate change, “social distance” and isolation. All the concepts mentioned here are directly or indirectly related to each other and affect each other in pandemic processes.

“Social distance” is a term that defines the practice of keeping a greater-than-usual physical distance from other people or avoiding direct contact with people or items in public spaces to decrease exposure and infection transmission, during a pandemic of an infectious illness (Merriam-Webster, 2003). The term “physical distance” is defined as “keeping a distance of at least 1 m from each other” and avoiding spending time in crowded places or in groups (WHO, 2020). The “new normal” is a state that the global economy and society have reached since the beginning of the COVID-19 pandemic (Miles, 2022).

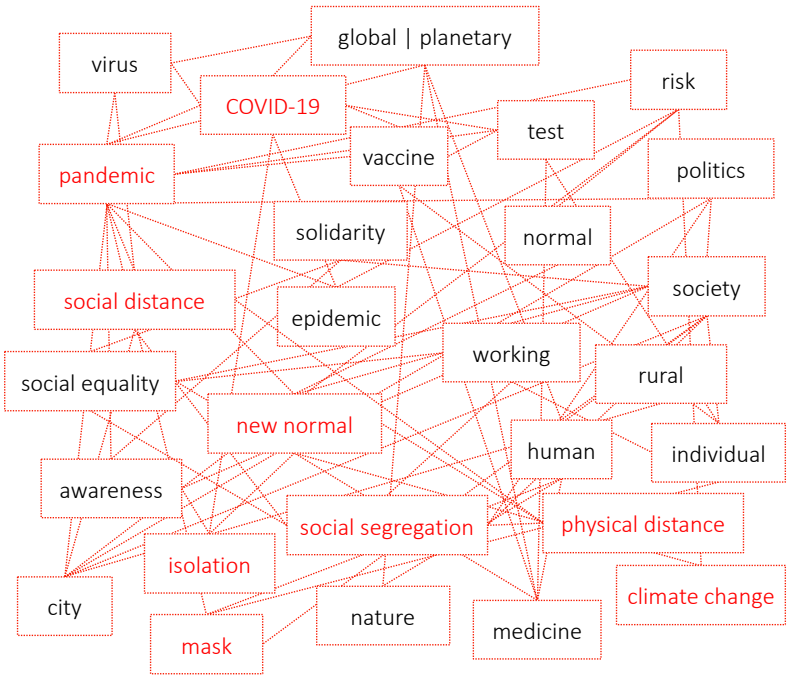

Figure 2. Concepts related to the pandemic. Source: Tezer, 2022

2.3. Pandemic and urban design experiences

The high rate of elderly population and economic weakness create vulnerability for most countries, an advanced health system and transparent information sharing are important for the correct management of the process. Activities related to human movement, especially tourism, and poor working conditions bring along the excessive spread of the pandemic. This section discusses what kind of intervention methods are preferred in urban areas during the pandemic.

The COVID-19 pandemic should be seen as an opportunity to make good use of public spaces, meet people's changing needs and enable more livable cities (Sepe, 2021). It is clear that the problems caused by pandemics, especially population loss, also forced architecture, urban design, and planning to evolve. After epidemics such as plague and cholera, cities’ neglected and cramped living spaces were cleaned up, borders were expanded, and larger public spaces were designed. The 20th century's epidemics brought healthy housing, waste management, segregated function areas, and an understanding of urban hygiene. The COVID-19 is expected to bring a similar change/transformation in cities. These following changes are possible: “Modular building” systems suitable for flexible solutions to be used in emergencies in cities, “adaptive re-use”, “lightweight architecture”, “healthy building”, “telecommuting and small-city living”, and -*paradoxically*- designing squares that both maintain social distance and meet people's need for

socializing (Lubell, 2020). When it comes to urban design in a time of global health crises, it is not only about design but also about our relationship with nature. As Roberta Palomba says, “We have abused nature, and [generated] epidemics”, and so when thinking about urban design, the focus should be on preventing the emergence of new diseases. In this respect, it seems more appropriate for urban design to aim for less crowded, more open, and accessible spaces, rather than “shiny new city centers” (Constable, 2020).

Since the beginning of COVID-19, WHO has announced the basic rules to be followed regarding the pandemic (World Health Organization, 2020). An important determinant in the relationship between urban design and the pandemic is emerging digital technologies. The widespread use of time-saving practices such as online banking, shopping, and remote working is expected to affect the form and open spaces of cities. Children, the elderly, people with disabilities, and low-income people need to be supported to access public spaces, especially after a pandemic (el Khateeb and Shawket, 2022; Davison and Lawson, 2006; Mackie, 2009). Investigating the resilience of public spaces to pandemics requires the design of an urban environment that can increase interaction between people and adapt to increase segregation when necessary (Stevens, Tavares, and Salmon, 2021). Post-pandemic public space design aims to improve access conditions to natural spaces, manage human flows and improve local ownership of public spaces, and make them safer and more vibrant (CATAPULT Connected Spaces, 2020). To make public spaces healthier, street designs suitable for the active mobility of pedestrians seem necessary. The pandemic is expected to change the design, perception, use, and management of public space in various ways. Urban design is inextricably linked to physical and mental health (Simmel, 2017). In a post-pandemic world, public spaces will continue to be valued for the opportunities they offer for socializing, recreation, making demands, and building community and identity. For urban design, this is a time to be “humble but brave” (Honey-Roses *et al.*, 2020).

UN-Habitat provides recommendations on COVID-19 and resilience building in two groups: short-term and long-term. Widening streets for active mobility and expanding the amount of land allocated for public spaces, making public spaces versatile, multifunctional, and adaptable so that they can cope with temporary facilities that may be needed during a crisis are some of the short-term recommendations. Public spaces should provide a platform for the sharing of transparent information and policies. Public spaces within a 10-minute walk from homes are necessary for mental health and well-being under pandemic conditions. The “15-minute compact city neighborhood” plan suggests a design that can provide services to all its people within 15 minutes, so supporting in preventing the spread of the virus. Surfaces used in public spaces where physical distance will be essential should be cleaned frequently and constructed with appropriate materials (UN-Habitat, 2020). Urban agricultural areas (micro vegetable gardens) and redesigning common areas such as courtyards and balconies in a sustainable way are some of the most prominent examples (Batty, 2020). Post-pandemic design aims to create more resilient urban spaces by considering the balance between physical distance and human interaction. Rebuilding trust, coordination between cities and public health stakeholders, effective use of smart technologies and redesigning public spaces are all part of this process (Czepczyński, 2020). Through new urban planning tools, local governments and urban designers will set new norms, rules, criteria, and principles that prioritize urban health by increasing the amount of accessible, open, and inclusive public spaces (Tuna Tasan-Kok, 2020).

From here on, some urban design practices developed during the pandemic in different parts of the world are listed for evaluation. In the first case, Domino Park in Brooklyn, USA, the floor is covered with 30 circles of 8 meters in diameter with 6 meters between them to ensure social (physical) distancing, and the users of the park immediately adapt to this practice and actively use the public space (Harrouk, 2020). The second example, "Parc de la Distance", designed by Studio Precht, was left as a design idea due to the closure of parks in Vienna. Designed in the form of a labyrinth so that people can spend time

outdoors while maintaining social distance during the pandemic, the fingerprint-inspired park offers the opportunity to walk in a safe and nature-infused public space (Holland, 2020).

Figure 3. Brooklyn - Domino Park. Source: Marcella Winograd, 2020. - Figure 4. "Parc de la Distance". Source: Courtesy of Studio Precht, 2020.

The “Gastro Safe Zone” design by Hua Hua Architects in Brno, in the Czech Republic proposes to separate walking and eating areas by creating safe outdoor eating places, a use of public space designed with basic materials and floor painting (Holland, 2020). Designed by Caret Studio for Giatto Square in the Tuscany Region, “StoDistante” is a grid system in which the floor of the square is painted white with reference to 1.8 meters, thus marking the areas where it is necessary to stand in accordance with the rules of physical distance (Hitti, 2020).

Figure 5. "Gastro Safe Zones". Source: Hary Marwel, Hua Hua Architects, 2020. - Figure 6. “StoDistante”. Source: Dezeen, 2020.

It is possible to multiply the examples of pandemic-era public space designs, of which a few examples are given here. In addition to the designs for public space, there have also been notable changes in the use of balconies and roof terraces of houses during the pandemic period. It is possible to suggest that these areas have become important parts of the public space with the pandemic.

Figure 7. Balcony usage in pandemic. Source: 1. Nicolò Campo, The New Yorker, 2020, 2. Paweł Kopczyński, Reuters, 2020.

3. Conclusion and discussion: Urban design after/in the era of pandemic

When evaluating the pandemic and urban design together, it must first be acknowledged that both the pandemic and the urban issue cannot be considered independently of the problematic stage that the world has reached as a social, economic, political, and ecological system. Understanding that the problem we are experiencing is a complete paradigm shift, the stage reached in the Anthropocene era, the industrial city, and the relationship of human beings to the world and nature within the capitalist system is the subject of important and large-scale research. This paper discusses how this paradigm shift can be interpreted by urban

designers with all these acceptances. The COVID-19 pandemic has disrupted not only daily life almost all over the world; but also lifestyles, work patterns, transportation, access to services, and the use of public and private spaces have all changed drastically. We need to reconsider all ideas about cities, public spaces, planning, and urban architecture at this point. Creating walkable, mixed-use, and socializing spaces, which is one of the main objectives of urban design, has become an important method of protecting mental and physical health during the pandemic (GOV.UK, 2021). The most important issue for urban design to deal with during and "after" the pandemic seems to be the contradiction between the idea of keeping people away from each other for health reasons and the importance that urban design places on human interactions.

On the other hand, in her book "The Topography of Wellness", S.J. Carr describes how historical outbreaks of cholera and tuberculosis changed cities and suggests that the 2-meter social distancing rule developed during the pandemic will redefine the planning and layout of public spaces (Carr, 2021). In their study examining the contradiction of bringing people together and at the same time keeping them apart in the public spaces of the pandemic, Honey-Rosés et al. recognize the fulfillment of people's need for social connection as one of the primary benefits of green spaces. By evaluating the efforts of planners and designers in this process and possible steps to be taken, they question whether it is possible to maintain social distance and at the same time bring people together. The team also emphasizes that, in addition to the physical and psychological benefits, more effective incorporation of green spaces into designs will help to create cities that are more resilient and resilient to future pandemics (Honey-Rosés *et al.*, 2020). Apart from reorganizing public spaces in terms of their location and capacity, it is important to separate entrances and exits, and to increase transparent surfaces in existing buildings. Another important strategy is to reduce unnecessary movement within the building by designing functions in a legible and easily accessible way. Establish quotas and time regulations for the use of common spaces and increasing the frequency of cleaning and ventilation processes can also be considered as important steps for the public spaces after the pandemic (Sipahi, 2020).

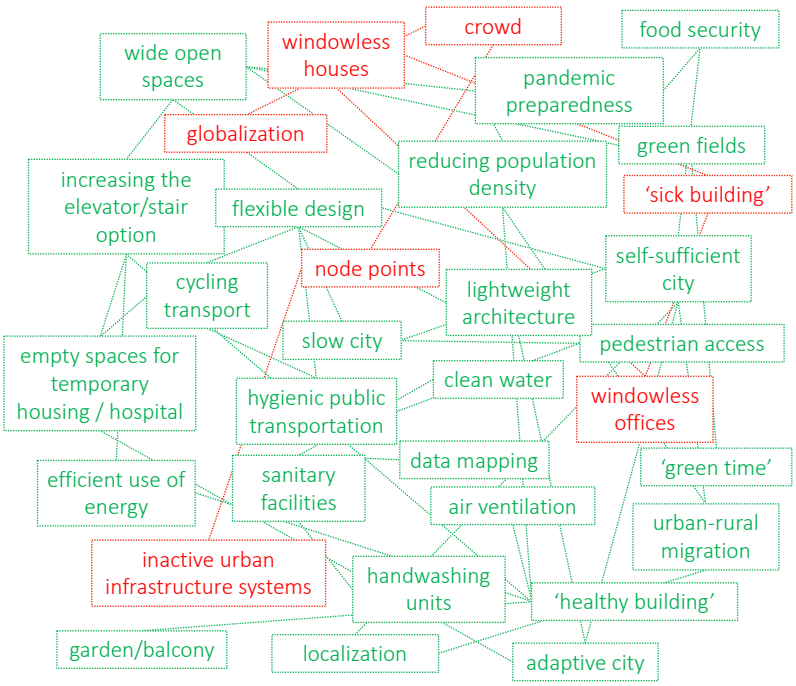

Figure 8. Urban design after/in the era of pandemic. Tezer, 2022

For urban design during and after the pandemic period, it is determined that human mobility increased by globalization increases the spread of epidemics together with poor infrastructure conditions, crowded groups concentrated at nodal points in cities, unhealthy/sick buildings. The issues that urban planning and urban design areas should prioritize during and after the pandemic are seen as "slow city", increasing the number of wide-open urban spaces, ensuring food security and clean drinking water in the city, inclusive urban

interventions for all population groups and living things, more flexible and adaptive structural solutions, efficient use of energy, creating a more balanced composition between urban and rural areas in terms of population.

This paper argues that it is necessary to define the process we are in as "the era of pandemics" and a change of vision in line with “cities of tomorrow”, which marks a paradigm shift. In this process, traditional gathering and public spaces are transforming from places where people are expected to come together under all circumstances to flexible but controlled spaces. In addition to physical components such as building materials, lighting and signage, concepts such as equality and segregation, inclusiveness, housing, workplace, access, ... all concepts related to the city constitute the conceptual baggage of this paradigm shift that must be reinterpreted in terms of urban design. In order for this paradigm shift to find its counterpart in the city, the main responsibility of urban designers and urban planners is to evaluate the realities of the process based on scientific data and to propose participatory and inclusive solutions that are flexible and include all components of society by making maximum use of today's technology.

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[i] Tuğçe Tezer is a Postdoc Researcher at the CITTA research center, Department of Civil Engineering, University of Porto, from February 2022 to February 2023. Her research (by the consultancy of Vitor Oliveira) in Porto, Portugal is supported by TUBITAK (The Scientific and Technological Research Council of Turkey) under the International Postdoctoral Research Fellowship Program (reference number: 1059B192101045).