

# EDITORIAL WELCOME TO THE INTERNATIONAL JOURNAL OF HEALTHY SPACE

As the Chief and Executive Editors, Professor Simon Bell and Dr Ziwen Sun would like to welcome you to this new interdisciplinary journal. We are aware that there are many well-established journals which in many ways also cover the theme of healthy space. However, we feel that there are gaps and a need to offer a platform in this area that can bridge theory, research and practice in a way that allows each aspect to inform the others and to integrate them to produce better results. As an open access journal with modest article processing charges, we hope to attract a mix of papers, including conventional research papers, reviews, theoretical explorations, presentations of methodological developments, critical reviews of proposed or completed projects, and short reports publicizing important ongoing projects, new books or policy initiatives. This first issue consists of a series of opinion papers which look back at the development of research into healthy space over the last 20 years with a focus on the European context and also look forward to what different leading experts from a range of countries see as the main priorities for the next ten years.

What do we mean by “healthy space” in this journal? We consider it a broad, inclusive term covering various aspects related to human and planetary health, as well as diverse types of spaces.

We use the World Health Organization (WHO) definition of health as "a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity"; this definition emphasizes that health encompasses more than just the absence of illness and includes positive aspects of physical, mental, and social functioning. We are also interested in the ecological health of primarily urban spaces, which we define as the state of ecological systems within urban environments, focusing on their sustainability, resilience, and overall functionality as influenced by urban development and human activities. It involves maintaining biodiversity, green spaces, water quality, air quality, and ecosystem services that support

both human wellbeing and environmental health in cities. A healthy urban ecological system can adapt to changes, reduce pollution, and enhance the quality of life for urban residents while preserving ecological integrity.

The term “space” here encompasses both indoor and outdoor spaces. Indoor spaces that affect health and wellbeing include residential, institutional, and commercial environments, such as homes, schools, hospitals, prisons, offices, factories and shopping centres, where people spend a great deal of time and where the environment impacts health in various ways, both positive and negative. Outdoor spaces include green, blue, and grey spaces at all scales, from the vastness of oceans and wild parks to agricultural and rural landscapes, and down to the city scale and smaller spaces within cities, such as parks and gardens. Green spaces are generally those covered in vegetation and include forests, parks, gardens, and green corridors, while blue spaces refer to bodies of water and their terrestrial margins, such as rivers, seas, lakes and canals. Grey spaces include urban streets, squares, and other hard-surfaced and generally non-vegetated spaces. We also wish to focus on the linkages between indoor and outdoor spaces that are often intimately connected.

A healthy space is one that, first, does not pose health risks-such as through pollution, radiation, exposure to pathogens, noise, and negative visual impact-and, second, supports human wellbeing by providing functional, safe, and attractive settings for various activities by diverse groups of people.

The subject of healthy space is multi-dimensional and multi-disciplinary, and we welcome submissions that originate from a range of fields, especially when they are interdisciplinary. These include the health and social sciences, such as public health, environmental psychology, health geography and sociology; the natural sciences such as ecology, horticulture, urban forestry, oceanography and hydrology; the planning and design sciences, such as urban planning, architecture, interior design, and

landscape architecture; and the humanities, such as politics, economics, history and the arts. This might seem as if the focus of the journal is very broad compared with others, but this is partly our purpose, since we wish to capture the multidimensionality of the subject and strongly believe that breadth is as important as depth.

The following is a selection (by no means exhaustive) of the health-and space-related aspects that are facing societies around the world and that we would like to see covered by the journal. The perspectives we offer below are a personal synthesis based on our experience, our own research, observations of our surroundings, readings of the evidence, and discussions with colleagues, forming a diagnosis of the problems we wish to address. We would like to encourage debates around these different aspects-which cannot be treated in isolation-within the journal.

### ***Health- and Wellbeing-related Factors***

Many aspects we need to consider are related to several social and cultural trends that have emerged or increased in importance in the first quarter of the 21st century. This selection represents what we consider to be some of the most important issues, and it is frequently referred to in research, public health policy, and the media. Some of these are of global significance, while others are more region-specific and address more acute problems that require urgent attention.

**The ageing society:** While the global population continues to increase, in many countries this growth has slowed and fertility rates have declined. As we live longer, the proportion of older people-those aged over 60 or 65, depending on the statistical definition-is increasing. The global proportion of people aged 60 and over is projected to rise from 10% in 2000 to 21% by 2050. This global figure masks variations across regions and countries. In Europe, the proportion of people aged 65 and over was already close to 24% in 2024 and is expected to reach around 30% by 2050; in the USA, 21%; in Japan, 33%; and in China, over 30%. This has significant implications for how older people live, from their 60s through their 70s and 80s and beyond. Income inequality, healthcare, and social care are all major challenges to be addressed, as is the design of living spaces. How will this population live, move, meet each other, experience nature, and maintain physical, mental, and social health?

**Physical health:** We live more sedentary lives as

a result of living in cities and working in jobs that do not require strenuous physical exertion. Coupled with a generally indoor lifestyle, reliance on cars and other forms of transportation, and dietary overindulgence, we face major problems, including a lack of physical fitness, overweight, and obesity; lifestyle diseases such as Type 2 diabetes; and generally poor levels of exercise. As society ages, older people, while remaining generally healthier, also start to lose mobility and experience physical decline. What is especially worrying is the lack of physical activity among children and young people, which impacts their long-term development and leaves them vulnerable to poor cardiovascular health later in life. How can spaces of different types, especially outdoor spaces, better support and encourage greater physical activity for people of all ages?

**Mental health:** We see greater prevalence of mental health problems among many groups of people, which was especially prominent during the COVID-19 pandemic of 2020 to 2022. It was obvious why such problems as depression, stress and anxiety should have risen during the lockdowns when people were socially isolated and worried about the impact of the disease. Since then, reported levels have remained high, in part because people were more conscious of their mental health and it is less stigmatising to talk about the issue openly. It might also be exacerbated by social media pressures, especially on young people. Additionally, there may be a trend to conflate feelings of being temporarily a bit low, anxious, or stressed-part of coping in everyday life-with more serious chronic or acute anxiety, stress, and depression, which are diagnosed as mental illnesses requiring treatment. Whether it is short-term or long-term, acute or chronic, we need to look after our mental health without relying solely on medical interventions. As we age, the prevalence of degenerative brain disorders such as dementia is increasing as a major problem. How can we encourage people to make use of spaces that offer contact with nature as a means of recovering from stress, depression, and anxiety? How can we design spaces that allow older people with dementia to live at home with dignity?

**Social wellbeing:** We are social animals and require contact with other people. However, many people lead increasingly isolated lives. They live alone for various reasons; they spend a lot of time online, communicating at a shallow level with other people; and they work from

home and rarely meet their colleagues. Such isolation affects mental health and reduces the ability to form lasting and meaningful relationships or to engage in bodily contact with others—touching, hugging, and other simple forms of contact are very important (although this depends on cultural norms). Social isolation during the COVID-19 pandemic became an acute problem, but many people seem not to have restored their social life to the same degree as pre-COVID-19, or else the increasing use of the internet and social media has led to a retreat from the real, external world and direct human contact into the internal, digital world, with contact through those platforms where people have many "friends" without forming solid bonds or where the incidence of online bullying and pressure to conform exacerbates feelings of social isolation, especially among young people. How can we create spaces that attract people away from the screen and digital worlds to meet and socialize in the real world and so to reinforce social ties and relationships?

**Digital media and emerging technologies:** The rapid proliferation of digital platforms, mobile devices, and new technologies such as artificial intelligence, wearable sensors, and virtual and augmented reality has reshaped the ways people experience health, space, and social life. While these innovations bring opportunities for improved health monitoring, access to information, and remote connection with others, they also introduce profound risks. Excessive screen time is associated with disrupted sleep patterns, increased sedentary behaviour, eye strain, and stress related to constant connectivity and information overload. Social media can amplify feelings of anxiety, inadequacy, and exposure to cyberbullying, particularly among younger populations. The design of urban and indoor environments must increasingly account for the integration of technology, balancing its benefits against opportunities for physical activity, face-to-face socialization, and restorative engagement with nature. How do we ensure that digital tools and emerging technologies enhance rather than erode wellbeing, and that they complement rather than replace the need for safe, healthy, and inclusive physical spaces?

**Children and young people:** While the challenges to children's wellbeing posed by social media and the internet have already been noted, a further threat to children and young people is posed by restrictions on their freedom to explore their outdoor environment and

to take part in free play. A number of reasons lie behind this: parental fears for their safety (whether from traffic or from "stranger danger"), less time for free play as a result of over-programmed lives, and children's own preference to spend more time on screens. Added to that, the lack of spaces and facilities for outdoor play, the blindness towards the needs of children embedded in urban planning policies and practices, and the risk-aversion expressed by many city authorities mean that children in many places have very poor play experiences. Play is an essential part of a fulfilled childhood, not just for improving physical fitness but also for learning how to socialize, navigate the environment, learn about themselves, and understand risk; some of the health and wellbeing problems experienced in later life have their roots in this lack of free play. How do we improve the quantity and quality of play spaces and persuade parents and carers to wean their children away from screens and into the outdoors?

**The new age of migration:** Many factors, including wars and economic challenges, have marked the early 21st century with large waves of migration in many regions. Some countries see their young and educated people leaving for better economic prospects elsewhere, leading to a brain drain, while wars have generated waves of refugees either stuck in camps or migrating, often illegally, to countries perceived as safe. While we are not focusing on the political and economic challenges to the receiving countries and regions here, there are many aspects of migration that have a bearing on how we plan and design spaces. Since many migrants come from religious and cultural backgrounds different from those of the host countries, they often experience problems assimilating into society. Language, education, access to housing, and services all play a part in this; so does access to and use of public outdoor space. Parks and other spaces may play an important role as places where migrants can meet and mingle with each other and with local people and get out of often cramped and low-quality living conditions. However, people from different cultures may use space differently. How can we plan and design space to help very diverse groups of people to obtain the health and wellbeing benefits of contact with the outdoors and nature?

While human health is profoundly shaped by genetics, lifestyle, and access to healthcare, the environments in which people live, work, and interact are

also major factors—often with both negative and positive effects. Urban environments, where the majority of the global population lives, are especially influential in this regard. Both outdoor public spaces, such as parks, plazas, transport corridors, and pedestrianised streets, and indoor public buildings, such as schools, libraries, community centres, offices, and cultural venues, create conditions that directly and indirectly affect human physical, mental, and social wellbeing.

The study of environmental factors and their relationship to health has expanded from a narrow focus on sanitation and pollution to a more holistic perspective that includes psychological, social, cultural, and ecological dimensions. We have already referred to the World Health Organization (WHO) definition of health and wellbeing, and the Organization has long emphasized that health should be understood as a state of physical, mental, and social wellbeing rather than simply the absence of disease. This expanded definition requires recognition of how spatial and material conditions foster or hinder wellbeing across multiple dimensions of life.

In this section, we provide an overview of the wide range of environmental factors that influence health in urban outdoor spaces and public buildings and that we wish to see covered in papers submitted to the journal, especially in relation to the implications for planning, and design of healthy spaces. These include physical, biological, built, social, and climatic dimensions, while also considering the interactions among these domains. The following environment-related factors need to be addressed:

### ***Physical Environment***

**Air quality and pollution:** Air quality is one of the most significant determinants of health in external and internal environments. Outdoor air pollution, particularly in dense urban areas, is driven by vehicle emissions, industrial activities, energy production and construction. These sources release harmful pollutants that can have serious impacts on human health. Fine particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), and ground-level ozone (O<sub>3</sub>) are among the most harmful pollutants. Long-term exposure increases the risk of respiratory illnesses, such as asthma and chronic obstructive pulmonary disease, as well as cardiovascular disease, stroke, and certain cancers. How

can we ensure that the open spaces of a city, especially the grey spaces, reduce pollution levels and mitigate the impacts?

Indoor environments often mirror outdoor air quality, but they also introduce additional hazards. Public buildings can accumulate volatile organic compounds (VOCs) released from paints, adhesives, cleaning agents and furnishings. Poor ventilation exacerbates these effects and allows for the buildup of carbon dioxide, which can impair cognitive performance. Inadequate indoor air quality also increases the risk of airborne disease transmission, a factor highlighted during the COVID-19 pandemic, where the importance of ventilation and filtration became globally recognized. How can we ensure that indoor spaces do not pose a threat by minimizing hazards and using better design and construction to ensure new or refurbished buildings are free from them?

**Noise:** Environmental noise—commonly generated by road traffic, aircraft, railways, and construction activities—is a ubiquitous stressor in urban life. Persistent noise exposure has been linked to elevated stress hormones, poor sleep quality, reduced concentration, and an increased risk of hypertension and cardiovascular disease. Outdoor noise is transmitted into public buildings, where inadequate insulation or poor architectural design may amplify rather than dampen its effects. Indoor noise from heating, ventilation, and air conditioning (HVAC) systems, electrical equipment, or human activity further affects comfort and concentration. In schools, for example, excessive noise is associated with impaired learning outcomes, while in hospitals it undermines patient recovery. How can we reduce the levels and impact of noise in the city and introduce places where silence, or at least lower decibel levels, are normal and the constant stress is eliminated?

**Light:** Light plays a critical role in regulating circadian rhythms, mood, and overall wellbeing. Access to natural daylight in external environments is associated with psychological restoration, vitamin D synthesis, and improved mental health. However, artificial lighting in urban spaces, such as excessive street illumination, can disrupt circadian cycles and impair sleep. Light pollution also diminishes the quality of outdoor night environments, undermining experiences of tranquility and safety. It also affects wildlife in similar ways by interrupting the circadian rhythms of birds and bats, negatively affecting

the urban ecosystem. How can we reduce the need for lighting in urban areas to reintroduce dark skies?

In public buildings, the provision of natural light through windows, atria, or skylights contributes positively to productivity and psychological wellbeing. Conversely, poorly designed artificial lighting, whether too dim, too harsh, or producing glare, can cause eye strain and headaches. Subtle aspects of lighting quality, such as colour temperature and uniformity, affect mood and concentration, highlighting the importance of careful lighting design for public health. How can we improve the quality of indoor light, especially by introducing more natural light into buildings?

**Thermal comfort:** Thermal environments exert direct effects on health through temperature regulation and indirect effects through energy consumption. Urban heat islands, created by the absorption of solar radiation in dense built environments, elevate outdoor temperatures especially during heat waves. Vulnerable populations such as the elderly, children, and those with pre-existing medical conditions face heightened risks of heat exhaustion and heatstroke. Conversely, prolonged cold exposure in poorly insulated spaces can exacerbate respiratory conditions and increase mortality rates. How can we improve outdoor spatial thermal comfort, especially during extreme conditions of heat or cold weather?

Inside public buildings, thermal comfort depends on adequate insulation, efficient heating, and cooling systems, and adaptive ventilation. Both overheating and underheating impair concentration, productivity, and comfort. Thermal stress also affects social behaviour, discouraging use of communal areas during uncomfortable conditions. Designing buildings and public spaces for passive thermal comfort, including shading, natural ventilation, and green elements such as interior plants, has therefore become a public health priority. How can we ensure that internal spaces are effectively regulated without using too much energy or releasing heat into the nearby outdoor spaces?

**Water and humidity:** Water quality and availability are foundational for health. In external environments, clean water access through fountains or sanitation facilities supports hydration and hygiene, especially in hot weather conditions. Inadequate drainage in public spaces can create standing water, leading to mosquito breeding and increased risk of vector-borne diseases. Polluted

waterbodies also pose risks to the benefits associated with being near, on, or in water at blue spaces, which are some of the most effective health-supporting environments in urban areas. How do we manage urban water so that it is always an asset and not a liability?

Indoor humidity levels influence respiratory health and pathogen survival rates. Excessive humidity fosters mould growth, which is linked to allergies, asthma, and other respiratory problems. Insufficient humidity can dry out mucous membranes, making individuals more susceptible to respiratory infections. Public buildings must therefore maintain balanced humidity through proper heating, ventilation, and air conditioning (HVAC) systems and maintenance. How can we ensure that humidity levels, linked to indoor thermal regulation, are optimal inside buildings?

### ***Biological and Ecological Factors***

**Green and blue infrastructure and biodiversity:** Exposure to natural environments has consistently been shown to provide psychological and physiological benefits. Urban green spaces, such as parks, street trees, community gardens, and green roofs, filter pollutants, regulate microclimates, and reduce noise. While urban blue spaces, such as rivers, canals, and the sea, provide recreational opportunities, provide contact with dynamic natural environments, and relieve stress. They also provide opportunities for physical activity, social interaction, and relaxation. Biodiversity within cities, including birdlife, pollinators, and diverse plant species, contributes to ecosystem health and enhances human connection to nature.

From a mental health perspective, contact with green and blue spaces reduces stress, improves mood, and fosters attention restoration. Children who have access to biodiverse outdoor environments often demonstrate improved cognitive development and social skills. Conversely, the absence of green or blue spaces or degraded natural environments is associated with heightened stress, alienation, and lower life satisfaction. How can we ensure that green and blue infrastructure is treated with the same importance, as other forms of urban infrastructure?

**Pests and pathogens:** Ecological imbalances in urban environments can introduce health risks. Outdoor waste accumulation attracts rodents and insects which may carry

diseases. Poor sanitation and stagnant water contribute to vector-borne diseases. Within public buildings, inadequate cleaning or maintenance allows for the proliferation of pathogens, including Legionella bacteria in water systems or mould in damp structures. Indoor pests, including cockroaches and dust mites, exacerbate allergies and asthma. How can we reduce the risks associated with pests and pathogens as part of urban management?

### ***Built Environment and Design***

**Density and spatial layout:** The spatial arrangement of cities influences patterns of interaction, disease transmission, and psychological comfort. High-density environments increase opportunities for social contact, but also heighten exposure to noise, air pollution, and contagious diseases, while often reducing the proportion of green and blue spaces. Overcrowding in public buildings and transport hubs creates stress, reduces privacy, and facilitates the spread of infections. Conversely, excessively dispersed layouts may discourage walking, limit access to services, and increase car dependency, contributing to sedentary lifestyles. How can we find the correct balance of urban density to provide optimal urban spatial layouts?

**Accessibility and mobility:** Accessibility is a central determinant of equity in health outcomes. Walkable environments, barrier-free routes, ramps, elevators, and accessible public transport enable participation across age groups and physical abilities or disabilities. Public spaces and buildings designed with inclusive principles foster independence and reduce social exclusion. Inadequate accessibility contributes to isolation, reduced physical activity, and psychological stress, particularly among vulnerable groups such as older adults and people with disabilities. How do we ensure that the urban environment is as inclusive and accessible as possible?

**Safety and security:** Perceptions of safety strongly influence the use of both outdoor and indoor public spaces. Poor lighting, secluded areas and visible neglect can generate fear, deterring people from engaging with their environment, especially among women and older people. Crime and antisocial behaviour, whether actual or perceived, produce stress and discourage physical activity and social interaction. In buildings, safety concerns include fire hazards, emergency exits, and structural stability. Safety design measures such as surveillance, visibility, and clear wayfinding contribute to psychological

reassurance as well as physical protection. How can we ensure that public spaces, both outdoor and indoor, are safe and perceived as safe while avoiding over-surveillance and compromising good design?

**Materials and surfaces:** The materials used in construction and furnishing influence both physical and psychological health. In external spaces, hard paving materials contribute to the urban heat island effect and impede water infiltration, while permeable and vegetated surfaces mitigate these challenges. In indoor settings, chemically emissive materials degrade air quality, while finishes with antimicrobial properties or easy-to-clean surfaces support hygiene. Aesthetic qualities of materials also affect mood and perception, with warm, natural materials often producing more positive responses than cold, industrial finishes. Materials also need to be sustainable and recyclable, following principles of material sustainability. How can we maximise the use of natural and sustainable yet durable materials in all environments?

### ***Social and Psychological Environment***

**Social interaction:** Public spaces are vital spaces for social life, fostering interaction among diverse groups and supporting community cohesion. Parks, urban squares, livable streets, riverside walkways, and community facilities enable casual encounters, organized activities, and cultural events. These interactions build social capital, which is closely associated with resilience, wellbeing, and reduced mortality. Conversely, environments that discourage gathering or promote isolation contribute to loneliness, depression, and poorer health outcomes. How can we plan and design spaces that encourage social interaction?

**Perceived safety and comfort:** The psychological experience of space influences behaviour as much as its physical attributes. Perceptions of safety, comfort, and inclusivity determine whether individuals feel welcome and are willing to use public environments. For example, women and minority groups may experience spaces differently, influenced by cultural norms, past experiences, or subtle cues embedded in design. Buildings and spaces that are hostile, intimidating, or unwelcoming can exclude certain populations, leading to inequitable health outcomes. A space may be designed with safety and comfort as major objectives, but if they are not perceived as such, then this may affect how they are used. How do

we ensure that places are not only designed for comfort and safety but are also perceived as such?

**Cultural and aesthetic values:** Design that reflects local identity, cultural values, and aesthetic preferences contributes positively to psychological wellbeing. Monotonous or alienating environments undermine attachment and satisfaction, while culturally sensitive design fosters pride, belonging, and social trust. Public art, heritage-sensitive architecture, and context-sensitive landscape design all play a role in shaping health through meaning-making and emotional connection. How do we ensure that these factors are not overlooked in design, but are also considered as important aspects and treated seriously?

### *Climate and Environmental Stressors*

**Weather extremes:** Urban populations are increasingly vulnerable to weather extremes associated with climate variability. Heatwaves, exacerbated by the urban heat island effect, produce spikes in mortality and morbidity, especially among vulnerable groups. Cold spells can similarly increase respiratory illnesses and strain energy systems. Flash floods damage property, and urban drainage systems often cannot cope with the volume of water. Drowning is a major cause of death worldwide. Public buildings, such as schools, hospitals, and shelters, play critical roles in mitigating these risks by offering thermal refuge. How can we design cities to be resilient to weather extremes?

**Climate change impacts:** Long-term climate change poses multifaceted health challenges. Flood events damage infrastructure, disrupt services, and contaminate water supplies. Rising temperatures worsen air pollution episodes, and extend the range of vector-borne diseases. Cities and buildings lacking climate resilience expose populations to escalating risks. Conversely, integrating adaptive measures, including flood defences using nature-based solutions (NBS), green infrastructure, and passive cooling, enhances our collective capacity to protect public health. How do we improve the climate resilience of cities through good planning and design?

### *Interconnections between Indoor and Outdoor Environments*

Although external urban spaces and internal public buildings are often studied separately, they are deeply

interconnected. Outdoor air quality shapes indoor air quality; outdoor noise penetrates the building envelope; climatic conditions determine heating and cooling demands indoors. Similarly, indoor crowding patterns affect disease dynamics in surrounding communities, while the design of public buildings influences how individuals engage with nearby streets and public spaces.

Moreover, health outcomes are rarely determined by a single environmental factor in isolation. Instead, multiple stressors accumulate and interact. For example, an individual exposed to air pollution outdoors, indoor noise, and limited access to green space may experience compounded stress that manifests in both physical and psychological illness. Conversely, well-designed environments provide synergistic benefits, which greenery simultaneously improves air quality, reduces heat, supports biodiversity, and fosters psychological restoration.

To achieve healthy spaces, a holistic understanding of environmental health requires cross-scalar perspectives, linking the landscape and architectural design, urban planning, public health, and environmental policy. The interdisciplinary collaboration is essential to address these complex dynamics.

The environments in which people live, work, and socialize are fundamental determinants of health. In external urban spaces, factors such as air quality, noise, heat, green and blue infrastructure, and perceptions of safety shape patterns of wellbeing and disease. In public buildings, indoor air quality, ventilation, lighting, accessibility, and cultural sensitivity are equally crucial. Both domains interact continuously with broader climatic, ecological, and social forces, producing complex and often unequal health outcomes.

Addressing these challenges requires integrated approaches that combine design innovation, ecological sensitivity, and social inclusion. Public health cannot be understood purely in medical terms but must be approached as a spatial, cultural, and environmental issue. By recognizing the wide range of environmental factors influencing health in cities, policymakers, planners, architects, and communities can work together to create healthier, more equitable, and more resilient urban environments. This journal aims to provide a platform for exploring and reporting on these multi-faceted aspects, which we consider part of the concept of healthy urban spaces.