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Editorial: Exploring the multifaceted relationship between human health and urban nature in times of crises

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Editorial on the Research Topic

Exploring the multifaceted relationship between human health and urban nature in times of crises

It is time to go beyond traditional boundaries and investigate a more thorough understanding of the relationship between green spaces and human health, even though research on this topic is well established (Vidal et al., 2022). This is especially important given the looming challenges posed by climate change and other compounding crises (Vidal et al., 2024). This editorial highlights the need for practical, inclusive, and equitable solutions while examining new paradigms that deepen our understanding of urban ecology, health, and resilience.

Numerous health advantages, such as less cardiovascular risk, better mental health, and increased social cohesiveness, have long been linked to green spaces (van den Berg et al., 2015; Lai et al., 2019). According to meta-analyses, those who spend more time in green spaces had a significantly lower all-cause death rate (Rojas-Rueda et al., 2019). Access to urban green spaces was crucial for psychological respite during the COVID-19 pandemic, highlighting its function as public health infrastructure (Slater et al., 2020). Access to these advantages is still uneven, though. Marginalised people are disproportionately affected by differences in the availability of green space, which exacerbates health disparities (Rigolon, 2016). Given that nature has the ability to reduce social and health inequalities, equitable access to it must be given top priority in urban development.

Conventional definitions of green spaces—parks, gardens, and tree-lined streets—fail to capture the diversity of urban nature. Innovative and multipurpose solutions that incorporate nature into urban infrastructure are encouraged by emerging frameworks such as Nature-Based Solutions (NbS) (Raymond et al., 2017). Examples of how nature can

be incorporated into densely inhabited regions to improve ecosystem services and climate resilience include rooftop gardens, vertical forests, and urban wetlands. For such innovations to be inclusive and relevant, participatory methods must serve as their foundation. Urban nature's psychological advantages are becoming more widely acknowledged as important aspects of public health. Stress reduction and mood enhancement have been associated with exposure to biodiverse habitats (Fuller et al., 2007). A fresh perspective on these advantages is provided by sensory urbanism, which highlights the multimodal experience of urban nature (Tabassum, 2024). The therapeutic value of spaces can be increased by designing them to engage sight, hearing, and touch, especially for groups that have restricted mobility or access to conventional green spaces (Lencastre et al., 2022, 2023).

A plethora of advantages have been identified with respect to enhancing urban climates, mitigating the effects of the Urban Heat Island (UHI), and fostering the development of cool urban areas (Lopes et al., 2023, 2024, 2022a; Pinto et al., 2024). This perspective is particularly advantageous for cities that implement effective strategies. Indeed, a substantial body of research underscores the imperative for urban areas to adopt more sustainable practices, with particular emphasis on the development of green spaces that offer "climate shelters" from extreme heat (Pinto et al., 2024). This is of paramount importance considering the escalating frequency and severity of heatwaves, which are becoming a regular occurrence and carry profound environmental consequences (Lopes et al., 2022b).

Initiatives including citizen science have become revolutionary means of involving communities in the management of urban green spaces and climate adaptation. Initiatives like urban rewilding and biodiversity monitoring encourage environmental awareness while enabling locals to participate in ecological stewardship (Hügel and Davies, 2020). Context-sensitive and adaptable solutions can result from the integration of citizen science into urban planning procedures. According to Palomo et al. (2016), co-created green spaces that represent the needs and values of the community have a higher chance of being sustainable and successful in the long run. This Research Topic consists of seven papers that investigate novel ways to redefine how we engage with urban nature. The papers explore a wide range of topics, such as the advantages of citizen science projects for mental health, the complex relationships between human well-being and urban biodiversity, the fusion of green industry and cultural revitalisation, and sustainable urban development in light of climate challenges. Through inclusion, multidimensional design, and participatory research, these contributions address socio-ecological concerns and broaden the conversation beyond traditional paradigms. The study of Ry Oh et al. investigates how nature-based citizen science projects can promote biodiversity preservation and human welfare at the same time. The study determines important aspects of the influence of five projects by evaluating changes in nature connection (self, experience and perspective) and mental health outcomes (such as anxiety, stress, sadness, and emotions) among participants. Wu et al. in their systemic review assessed the relationships between human health and the biodiversity of urban green spaces with the analysis of 41 studies published between 2018 and 2023. Restoring mental health capacities and enhancing physical health capacities are the two

main ways that biodiversity affects health, according to the review, which covers studies conducted in 15 different nations. The study of Ding et al. examined the economic effectiveness and factors influencing Jiangsu Province's cultural sector through the Data Envelopment Analysis (DEA) model. The study identifies inefficiencies in Jiangsu's cultural industry which include poor scale efficiency, small firm size, and difficulties with urbanisation processes. The evaluation of green sustainable development of Kunming, a plateau lakeside city near Dianchi Lake, over the last 30 years was conducted by Peng et al., showing that while population increase and economic size emerge as key drivers of sustainability, urban expansion—including the loss of arable land and wetlands—presents serious obstacles. This study also points to objective and subjective weighting methodologies that are relevant to the research behind the construction of more robust indices, using the Analytic Hierarchy Process (AHP) and the CRiteria Importance Through Inter-Criteria Correlation (CRITIC). The study of Chen et al. investigated the coupling coordination and interactive dynamics between population urbanization and land urbanization in Jiangsu Province, China, from the perspective of shrinking cities, considering the period of 2007–2020 and 13 cities. The results show an "inverted U-shaped" relationship in which internal systemic forces shape land urbanisation while population urbanisation influences it. Finally, Proches presented a mini review about the relationship between citizen science, nature enjoyment, and nature-based tourism, particularly in light of the COVID-19 epidemic. Online citizen science platforms grew throughout the epidemic, mostly through "backyard" observations, whereas tourists decreased. The study emphasises the growing interest in researching nature appreciation as well as the benefits of getting back outside for mental health, especially for city inhabitants.

Considering the papers presented in this Research Topic it can be said that the urgency of escalating problems demands a paradigm change in the way we think about and design urban green areas. Urban settings can be made healthier, more resilient, and more sustainable by adopting inclusive, evidence-based, and participatory techniques. In order to create just and climate-resilient cities that put the welfare of people and the environment first, this agenda urges coordinated work across disciplines, sectors, and communities.

Author contributions

DV: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. HL: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing. RM: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing.

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