https://doi.org/10.1038/s44220-023-00171-4

Bright lights, big cities and mental health

The world's population is becoming increasingly urbanized, which brings new considerations for the effects of urbanicity on physical and mental health. Despite the complexity, there is a tremendous opportunity for research to use new tools to examine the reciprocal relationship between mental health and urban environments to improve outcomes and communities.

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In the past few years, profound structural changes have occurred in the way that people around the world live and work. The COVID pandemic ushered in a new paradigm that challenged longstanding norms, particularly in developed countries. The rapid and unanticipated need for practicing social distancing while preserving access to services or business continuity produced a digital renaissance in healthcare and the workplace and reshaped industries. Previously unthinkable remote and hybrid working models have proven nearly impossible to reverse. The pandemic period has also been a time of establishing new patterns of how individuals negotiate the balance between their work and personal lives, the prioritization of physical and mental health, and the need to connect with physical surroundings through access to green and open spaces. These shifts have prompted wide contemplation of our interactions with built spaces versus nature more generally, and acquainted the public with contemporary fields of study such as human geography, or the way that human cultures, communities and economies are spatially oriented with the environment.

Movement has also been a major theme. In the USA, for example, about 16 million people moved residencese; 2 million of whom left large metropolitan areas for less densely populated areas, such as smaller cities and suburbs. Although the population distribution in urban areas in the USA has normalized since 2020, the effects of pandemic-related relocation and remote work trends are still keenly felt in many cities. Scenarios such as 'urban doom loops' in a handful of once-thriving metropolitan areas have become concerns, in which plummeting occupancy for commercial real estate has led to downstream consequences, including reduced tax revenue, business closures and deteriorating infrastructure. However, these may be exceptions as the global urban development outlook indicates that populations continue to become increasingly urbanized. At present, about half of the world's populations live in urban areas, a proportion expected to rise to about two-thirds by the year 2050.

In an increasingly urbanized world, urbanicity has become an increasingly important concept. Urbanicity is often used to refer to the constellation of characteristics and attributes of urban areas and the effects on the people who live there, such as population density, public infrastructure and socioeconomic conditions. Considering urbanicity in relation to health highlights other salient elements including interactions with social and physical environments, access to health-related and social services, and the qualitative effects on individuals, communities and populations living in an urban center.

The effect of urbanicity may bear substantially on mental health. Much of the work exploring the potential links between living in an urban area and increased risk for the experience of a mental health condition has focused on psychosis or schizophrenia and symptoms of anxiety and depression. The relationship between specific factors of urbanicity and mental health risk, however, is not well understood owing to the potential complexity. For example, negative aspects of urbanicity, such as urban stress or exposure to pollution, may confer risks, but positive aspects of urbanicity, such as greater access to healthcare and resources, may mitigate the risks associated with mental health conditions.

This issue of *Nature Mental Health* explores some of the themes inherent to urbanicity and mental health. In a Comment by Gunter Schumann on behalf of environMENTAL consortium, the potential for applying large datasets and statistical techniques to investigate urbanicity and mental health are explored. By harnessing newly developed environmental data sources, such as movement tracking and geopositioning, researchers can incorporate and enrich existing health measures from large population-based cohorts such as the UK Biobank with high-dimensional effects of urbanicity.

A potential area of interest within urbanicity is the way in which light, both artificial and natural, is a central part of one's physical environment. Light is fundamentally connected to health and can be a mechanism for improving equity. For example, although light pollution, specifically bright artificial light emanating

from cities, can be an issue that affects sleep quality, well-designed urban lighting can be instrumental for improving safety in outdoor spaces. Furthermore, how and when we interact with light may be crucial. The human circadian rhythm is primarily regulated by light, and circadian rhythm and sleep disturbances are features common to many mental health disorders, but our understanding of the influence of timing of light exposure on mental health is limited.

In the issue, an Article by Burns et al. reports the largest cross-sectional analysis so far looking at light, sleep, physical activity and mental health outcomes. The authors tracked day and night light exposure and health metrics in 86,722 participants from the UK Biobank. The findings suggest an inverse pattern: greater light exposure at night was associated with an increased risk of several psychiatric disorders, including major depressive disorder, generalized anxiety disorder and psychosis, whereas greater light exposure during the day was associated with a reduced risk of this same group of disorders. The authors suggest that the findings support the notion of using light as a potential non-pharmacological intervention for improving mental health. In an accompanying News & Views, Jamie M. Zeitzer proposes potential refinements and considerations to overcome some of the present limitations in studying the effects of environmental lighting on mental health.

Light is just one aspect of the many environmental conditions and features of urbanicity whose effect on mental health may have been underestimated. Broadening the view of how mental health is intricately connected to our interactions with the physical world is the beginning of an exciting path in multidisciplinary research. Within the portfolio of the Nature Research journals, we are at the outset of a period of launching thematic research journals dedicated to publishing work that may transcend traditional fields and find synergies between them, such as with mental health and urban environments.

One of the newest additions is *Nature Cities*, a transformative, monthly, online-only journal, which will launch in January 2024. As William Burnside, chief editor of *Nature Cities*, underscores, "Cities and mental health have a reciprocal relationship, with urban environments affecting the mental health of urban residents whose behavior then affects their urban environments. Illuminating these relationships is essential to understanding cities holistically. *Nature Cities* welcomes submissions of research and opinion that foregrounds the urban in considering mental health, such as studies considering urban density, segregation, sprawl, crime, pollution, public services, and greenspaces." By expanding the number of high-quality outlets for research that seeks to understand the trends, interactions and mechanisms that underlie human activity in urban environments, our intention is to provide more opportunities for researchers to share their insights and connect with each other. We hope that you will join us in being part of a community that is passionate about improving mental health and eager to create healthier, sustainable cities.

Published online: 6 November 2023