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Editorial

Promoting and Sustaining Urban Health: Challenges and Responses

Roderick J. Lawrence

Geneva School of Social Sciences (G3S), Institute for Environmental Sciences (ISE), University of Geneva, 1211 Geneva, Switzerland; roderick.lawrence@unige.ch

1. Introduction

We live in a rapidly urbanizing world. Urban development accelerated last century in tandem with demographic and economic growth. From 1960 to 2000, the global human population doubled to reach 6.08 billion, and it is projected to increase to 9.7 billion in 2050. The urban share of the global population increased from 29% in 1950 to 51% in 2011. Urban living conditions are experienced daily by more than half of the world population, and this share is predicted to increase to about 70 per cent by 2050 [1]. Urban development, coupled with demographic and economic growth, produced intended and unintended positive and negative outcomes on natural and human-made ecosystems. Cities occupy only about 2 per cent of the total land surface whereas they contribute about 70 per cent of global GDP, over 60 per cent of global energy consumption, 70 per cent of global greenhouse gas emissions, and 70 per cent of global waste [2]. Urbanization is the source of numerous environmental and social problems, including irreversible losses of animal and plant biodiversity and depleting nonrenewable resources following changes to land use for urban development, increasing toxic air pollution (in large cities including Beijing, Mexico, and Paris), access to safe drinking water and sanitation (in Cape Town, Jakarta, and Mumbai), and the accumulation of non-biodegradable liquid, plastic, and other solid wastes in all regions of the world [3]. Although the health of urban populations has improved in accord with statistics of life expectancy at birth, databases also record increasing incidences of socio-economic inequalities in cities that reflect inequalities in population health and well-being across the lifespan. In essence, although people are living longer, their lives suffer from poorer physical and/or mental health [4].

This introductory paper posits that multiple relations between urban and planetary health should serve as the overarching framework to guide the implementation of the United Nations 2030 Agenda for Sustainable Development. It explains that the inclusion of SDG 3, which aims to "ensure healthy lives and promote well-being for all ages", is admirable, but it is unfortunate that the principles of ecological public health applied to understand urban health remain implicit. In addition, the tacit relationship between this and other goals, especially SDG 11, which aims to "make cities and human settlements inclusive, safe, resilient and sustainable", should have been highlighted to promote relational thinking during research, policy definition, and project implementation at both national and local levels [5]. Systems thinking is one important way of improving our understanding of how ecological, cultural, political, and epidemiological factors mutually interact and influence health of urban populations [6]. This paper explains and illustrates why collaboration and concerted action between professionals, politicians, researchers, and citizens is necessary to understand and respond to complex challenges of implementing the SDGs and promoting planetary and human health in a world of rapid urban development. The contributions in this Special Issue illustrate how this has been achieved in different regions of the world.

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2. Urban and Planetary Health in the Context of Urbanization

This section presents interpretations of health, ecological public health, planetary and urban health, and why these are pertinent in the context of a rapidly urbanizing world. These interpretations are incorporated in a conceptual framework for implementing the sustainable development goals using SDG 3 and SDG 11 as dual entry points for relational thinking about synergies, compromises, and trade-offs between all 17 goals and their 169 targets, specifically at the geo-political level of mega-urban regions, local authorities, and communities.

2.1. Health: A Wholistic Interpretation

Health is a dynamic condition for humans resulting from multiple inter-relations between all the biological, cultural, chemical, economic, environmental, geographical, physical, political, and social constituents of their habitat, that form a compound web shown in Figure 1. Health is place-based, and should be considered as locality specific, not just population-specific. Empirical research confirms large differences between the health of residents in different cities in the same country (e.g., Edinburgh and Glasgow), as well as between residents living in different neighbourhoods in the same large city [7]. These known health inequalities do not respect ethical principles including "no one will be left behind" in the United Nations 2030 Agenda for Sustainable Development [8].

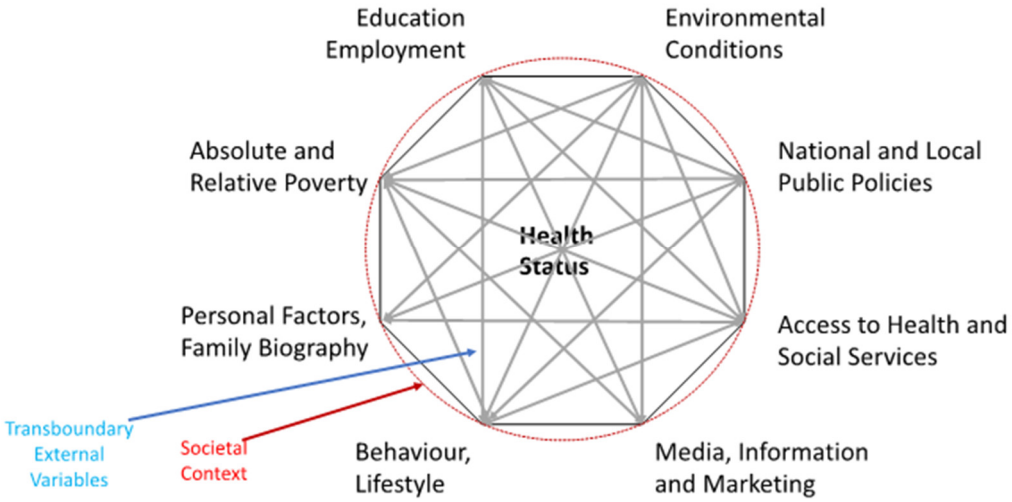

Figure 1. The health status of urban populations is influenced by the mutual interaction between eight sets of variables shown in this figure. These eight sets of variables form a dynamic system with permeable boundaries. The variables are context-dependent and place specific and they should be understood according to the specificity of each city and urban neighbourhood to explain growing inter- and intra-urban differences documented since the 1990s. © Roderick Lawrence.

Health is both an individual and a collective condition that is co-created. This dual condition is illustrated by the complexity of housing-health interrelations, including damp and cold housing, afflicting both individual residents and households living in poor quality residential buildings [9]. It is also illustrated by efforts to address public health challenges; for example, collaboration between politicians, medical officers, and professionals in the field of the built environment, during the nineteenth century, reduced risks of contagion of infectious diseases, including tuberculosis and cholera [10]. These historic examples can provide lessons about the need to "de-medicalize" common interpretations of persistent health challenges [11]. They also confirm the need for combined interventions, including environmental goals, social objectives, and technical targets, to account for the crucial role of built environments and other societal conditions that influence health, well-being, and lifestyles of urban populations [12].

2.2. Health: A Rights Perspective

In principle, health is a fundamental human right, recognized in the Universal Declaration of Human Rights, that incorporates ethical principles concerning environmental and social justice incorporated in the United Nations 2030 Agenda for Sustainable Development [8]. Moreover, empirical research confirms that health is also an essential component of national development, and that it is vital to a nation's economic growth and internal stability. Since 2000, this mutual interaction has occurred during the SARS-CoV-2 pandemic and it provoked global financial, health, and social consequences.

Since 2000, there have been increasing health care costs, reduced government expenditure on public medical services coupled with their privatization, and declining universal coverage of health insurance. Notably, health is increasingly influenced by intentional political agendas that have reduced spending on public infrastructure, privatized community health and welfare services and transferred responsibility to nongovernment organizations, community associations, and citizens. Nonetheless, research confirms that improved health contributes significantly to reducing poverty [13]. In the field of health promotion, health is the capability of all people to achieve their potential and to respond positively to challenges of daily life. Notably, since 2020, the coronavirus pandemic has highlighted and increased inequalities in employment, education, health, income, and socio-economic status in many countries.

Health is an asset, and a resource for everyday life, rather than a standard or outcome that ought to be achieved [7]. This interpretation is needed for improved understanding of the multiple interrelations between health, human behaviour, and built and natural environments in the context of rapid urbanization. A growing volume of empirical studies in cities around the world indicate that environmental and social conditions in specific urban neighbourhoods do impact human relations; they may induce stress, and they can have positive or negative impacts on health and well-being [14,15]. This multi-dimensional interpretation of health is founded on core principles of human ecology [16]. It underscores the limited capacity of the medical and health-care sector to facilitate health promotion and prevention. Hence, close collaboration with other sectors would not only be beneficial but is much needed to improve health and well-being. Notably, effective co-ordinated responses to both infectious and non-communicable diseases can be facilitated by convergence and coordination involving multi-level governance with publicprivate-community consortia, the allocation of many types of resources, the appropriate time, and individual and communal adherence to behavioural rules and social prescriptions [17].

2.3. Principles of Ecological Public Health in Urban Areas

The interpretation of urban health should specify what is meant by urban and health and how they are interrelated in specific situations [7]. Given the global phenomenon of urbanization, it is surprising that there still is no international consensus about the definition of a city, or an urban agglomeration, or a mega-urban region. Although the definition of a city varies from country to country, the United Nations uses national definitions that are commonly based on population size [18]. Megacities are often referred to as those with a population that exceeds ten million [3]. Other interpretations are based on the administrative or political authority of local authorities, especially the degree of autonomy in relation to national and regional authorities. Some definitions include the socioeconomic status of the resident population, especially their livelihood (e.g., the proportion of all employed people with non-agricultural occupations). A combination of these characteristics could be used to interpret rural and urban areas, but this is rare, especially in recent published research on health in the context of rapid urbanization.

The compound effect of economic, environmental, social, and technological hazards in precise localities should be understood using core principles of ecological public health [19]. Then, more effective responses can be planned and implemented to improve the health of urban populations [7,17]. These four main sets of hazards are variable over short and relatively long periods of time. Their dispersion and effects are complex and the exposure

of different groups of urban populations (e.g., children, the elderly, ethnic minorities, and the unemployed) needs to be understood. Biological inherent mechanisms are mediated by the social and environmental circumstances of urban living conditions. Therefore, it is necessary to interpret the health of urban residents in terms of individual, social. cultural and spatial variables by explicitly accounting for age, gender, socio-economic status, occupational status, and the geographical distribution of the population.

Urban research about the interrelations between health, natural environments, and human habitats has been completed and published by a growing number of disciplines and professions since 2000. Collectively, these contributions confirm that conventional biomedical models of public health are too restrictive to account for environmental, economic, political, and other societal conditions that influence individual and population health. Systems thinking is necessary to deal with the complex, emergent, and multidimensional character of urban health. For example, Rutter et al. (2017) [20] criticized responses to public health challenges that rely on linear models of cause and effect. They argued that these simple models should be replaced by holistic interpretations including interrelated variables that form complex, dynamic systems. Unlike linear models, these systems cannot be predicted by analysis of individual components that are isolated from their context. For example, the persistence of malnutrition should not be considered only in terms of the availability and affordability of safe food in local markets, because this condition is influenced by public policies for agricultural subsidies to the agro-industrial food system, food allowances to low-income households, and individual and collective behaviours including physical activity. This example highlights that multi-causal urban health challenges cannot be resolved by interventions that target a few variables often disconnected from the living conditions of urban populations. Our review and criticism of research about housing and health concluded that many empirical studies on this multi-dimensional subject are founded on simplistic linear thinking about causality [21].

2.4. Global and Planetary Health

Public health refers to the health of a selected public, or population, that is considered at national, state, city, or neighbourhood levels [22]. Global health concerns populations internationally, rather than health challenges within countries, regions, or communities [23]. Interventions to control or eradicate cholera, measles, or tuberculosis are examples in many countries, now complemented by responses to coronavirus. Global health acknowledges that health is determined by situations and concerns (such as local climate, poverty, housing conditions, public policies, and access to affordable medical care and health services) that affect public health across national geo-political borders.

Planetary health incorporates the core principles of sustainable development endorsed by the United Nations Conference on Environment and Development in Rio de Janeiro in 1992. It enlarges conventional interpretations of environmental health (e.g., risks or threats to health stemming from air, food, soil, water, or other components of human environments) by incorporating ecological, economic, and ethical concerns [24]. The final report of The Rockefeller FoundationLancet Commission stated:

> "*Planetary health is the achievement of the highest attainable standard of health, wellbeing, and equity worldwide through judicious attention to the human systems—political, economic, and social—that shape the future of humanity and the Earth's natural systems that define the safe environmental limits within which humanity can flourish. Put simply, planetary health is the health of human civilisation and the state of the natural systems on which it depends.*" [25], p. 1973.

Planetary health comprises a composite set of biological, cultural, ecological, economic, ethical, social, and political factors that can impact positively or negatively on natural ecosystems and all their constituents, as well as built environments, infrastructure, and human health. It incorporates the core principles of human ecology and ecological public health described in Lawrence (2001) [16]. The recent coronavirus pandemic is an obvious

example because it is derived from a species jump in the context of changes to animal and human habitats resulting from rapid urbanization.

In contrast to global health and public health, planetary health explicitly considers whether improvements in population health and quality of life occur to the detriment of constituents of the biosphere (e.g., the ozone layer, greenhouse gases), the abiotic and biotic components of natural ecosystems, and the health and well-being of all humans.

Planetary health acknowledges that recorded improvements in population health during the last century have been achieved in tandem with the large-scale degradation of natural ecosystems in all continents [26]. Despite significant economic growth during the same century, socio-economic inequalities between population groups have increased, especially within the geo-political boundaries of cities [27]. According to the Rockefeller FoundationLancet Commission, this international trend has created a planetary crisis because increases in economic wealth and demographic growth, and improvements in population health, have occurred at the expense of irreversible degradations to the constituents of the biosphere, natural ecosystems, and resources that are fundament life support systems [25].

3. Sustainable Development Goals and Urban Health

The third Sustainable Development Goal, SDG 3 'Good Health and Well-Being', aims to "ensure healthy lives and promote well-being for all ages". It accounts for the wide range of variables that are known to influence health and well-being, which are listed in Box 1.

Box 1. SDG 3 Targets: Good Health and Well-being.

- By 2030, reduce the global maternal mortality ratio to less than 70 per 1000 live births.
- By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-5 mortality to at least as low as 25 per 1000 live births.
- By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.
- By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.
- Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.
- By 2020, halve the number of global deaths and injuries from road traffic accidents.
- By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.
- Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.
- By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

Source: United Nations [8]

SDG 11 'Sustainable Cities and Communities' promotes "inclusive, safe, resilient and sustainable cities and communities" (see Box 2). It covers the wide range of spatial units from individual housing units to shared conditions in urban neighbourhoods and the ambient characteristics of cities and mega urban regions. Both SDG 3 and SDG 11 consider the fundamental contribution of human habitats, and especially ongoing urbanization processes, and their consequences for transitions to more ecologically viable, socially just, and economically efficient living that are prerequisites for sustaining health and well- being [5]. The central position of human habitats and urban development has been incorporated in the New Urban Agenda endorsed at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) held in Quito, Ecuador, in October 2016. Convergence between the SDGs and the New Urban Agenda recognizes the

synergies between strategic visions and projects of local authorities and the objectives of national development programs in the context of international agendas [5]. A key issue is how the healthy lives of residents in rapidly growing cities can be nurtured and sustained while ensuring ecosystem health and human well-being.

Box 2. SDG 11 Targets: Sustainable Cities and Communities.

- By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.
- By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
- By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.
- Strengthen efforts to protect and safeguard the world's cultural and natural heritage.
- By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.
- By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
- By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.
- Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning.
- By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels.
- Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials.

Source: United Nations [8]

3.1. A Federating Framework: The 5P Model

The United Nations 2030 Agenda for Sustainable Development includes a reference framework called the 5P Model, shown in Figure 2, including people, planet, prosperity, peace, and partnerships [8]. This generic framework incorporates more core principles than the well-known three pillars of environmental, economic, and social parameters proposed in the Report of the World Commission on Environment and Development, The Bruntland Report [28], and it was endorsed at the United Nations Conference on Sustainable Development in 1992 [29].

The 5P Model is founded on the following meanings and their applications. The first P designates people and a human-centered approach, founded on the core principles of environmental and social justice, that should reduce poverty and hunger while promoting secure and safe living. However, this people component does not explicitly address the influence of human beliefs, motivations, values, and worldviews that are the foundations of an anthropologic that frames individual–society–environment–biosphere interrelations [30].

Second, planet refers to evolving global conditions, including climate deregulation and extreme weather events, and loss of biodiversity and increasing desertification. These trends are influenced by human activities, including the impacts of consumption and production processes, uses of nonrenewable natural resources, and whether human needs of current and future generations will be met [24,25].

Third, prosperity refers to the livelihoods for all human beings provided by economic, social, and technological progress. This equates development with economic growth, technological innovation, and material property: it was the foundation of the original economic pillar of sustainable development in Our Common Future [28].

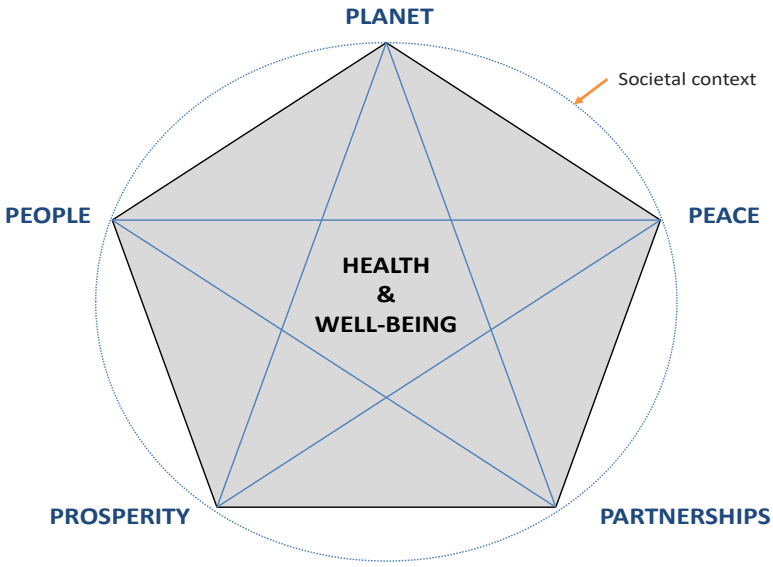

Figure 2. The 5P Model replaced the three pillars model of sustainable development. We argue it should be enlarged to include purpose, which recognizes the fundamental contribution of human intentionality and fundamental values [30]. © Roderick Lawrence.

Fourth, peace denotes fostering just and inclusive societies without violence, warfare, or a sense of insecurity. However, fundamental human values and ethical principles about increasing ethnic, gender, and socioeconomic differences should have been underlined. Fifth, partnership refers to collective actions by public–private partnerships, based on a spirit of stronger global solidarity between all countries and stakeholder. Partnerships were endorsed at the World Summit on Sustainable Development held in Johannesburg in 2002 [31]. They require a fundamental shift to communal or collective action.

Morton et al. (2017) [32] proposed that the 5P Model is related to the 17 SDGs in the following way. They designated SDGs 1, 2, 3, 4, 5, and 6 with people; then SDGs 13, 14, and 15 are grouped with planet, whereas SDGs 7, 8, 9, 10, 11, and 12 are associated with prosperity. Peace is related to SDG 16 and partnership with SDG 17. This unilateral classification ignores plausible multiple interconnections between the 17 SDGs that should be identified by relational and systems thinking.

3.2. Forward Look beyond the 5P Model

Lawrence [30] enlarged the 5P Model when he proposed a sixth P which designates purpose. In principle, intentionality, motivations, and values should be associated with all 17 SDGs because they implicitly or explicitly influence all human activities, meanings perceptions, and preferences including our relations with others. Notably, the social purpose of sustainability will become increasingly important in a rapidly changing world confronted by uncertainty, unpredictability, and the complexity of persistent problems including restricted access to healthy food, secure housing, affordable energy, and potable water.

Concern about human intentionality has been a catalyst for our critical thinking about the 5P Model; in particular, why Politics or Political Commitment was not prioritized in 2015 when this model was endorsed. Notably, insufficient political commitment by national and local authorities has been a major barrier to implementing international agreements for sustainable development during the last 50 years and major reforms are needed [33]. Meanwhile, member countries of the United Nations continue to discuss voluntary, non-binding agreements to address new and persistent global challenges knowing that penalties or sanctions rarely apply when these agreements are not respected. In addition, there are too few incentives to change political agendas, or public policies, or the strategies of business in the private sector. Unfortunately, many mainstream political agendas grounded

in neoliberalism, nationalism, and populism have dismissed the common good as their sense of purpose. Consequently, during the last three decades, reduced expenditure for public infrastructure and community services, plus deregulation of industrial, technical, and land-use markets coupled with the privatization of energy, housing, transport, and waste services, has been recorded in numerous countries. Therefore, the non-prioritization of the political context in which sustainability was proposed in 2015 must be criticized. Current global challenges in our world should not be disconnected from the roles and responsibilities of political authorities, which have the mandate, and the authority and power to act differently with moral responsibility [34].

3.3. Implementing SDG3 with Transdisciplinary Contributions

Interdisciplinary and intersectoral professional collaborations are urgently needed to implement the Sustainable Development Goals at the level of local authorities. This societal agenda requires a major reorientation from disciplinary and multidisciplinary contributions to inter- and trans-disciplinary projects that transgress the administrative borders of sector-based approaches in both the public and private sectors [34]. Definitions of disciplinary, multidisciplinary, interdisciplinary, and transdisciplinary contributions were presented in an earlier volume of Sustainability [35]. These modes of research and professional practice are complementary, rather than being mutually exclusive. Our research since 2015 concluded that innovative urban programs and projects which enable planetary and human health are occurring in many cities North and South of the Equator [36]. Recent examples from cities and countries in different regions of the world are described in Section 4 later; the papers included in this Special Issue were produced by authors working in different research areas and professional sectors.

4. Synthesis of Contributions in This Issue

The eleven contributions in this Special Issue on Promoting and Sustaining Urban Health represent a small sample of ongoing and recent research related to urban health challenges worldwide. The authors from countries including Australia, Brazil, China, Columbia, Ireland, France, Germany, Kenya, Mexico, the Netherlands, Norway, Peru, Russia, South Africa, Switzerland, Taiwan, the United Kingdom, and the United States of America document research from the small scale of households and individual residential buildings to urban neighborhoods and populations in large cities. This collection of articles discusses the diverse and multiple health impacts of ambient environmental conditions, the provision of urban infrastructure, and access to affordable health services. They apply quantitative and qualitative methods using relational thinking about the influences of urban living conditions on residents of specific buildings, neighborhoods, and urban agglomerations. Collectively, these contributions explain and illustrate that promoting and sustaining urban health should be considered as a global intersectoral challenge both within and beyond the medical and health sectors and not only at national levels of government. Jointly, they confirm there is accumulated evidence that housing design, building construction, and ambient living conditions in cities influence population health. Consequently, the explicit interrelations between the goals and targets of SDG 3 and SDG 11 should be identified, quantified, and better understood, but this is still not common in sectors such as community health, housing, and urban planning.

4.1. Health Co-Benefits of Residential Buildings

Two papers in this Special Issue critically examine whether individuals and institutions in the housing sector interpret the characteristics of large multi-family residential buildings according to their influence on the health and well-being of residents. The first paper by Tamara Al-Obaidi and her colleagues (Contribution 1) presents the results of desktop research that analyzed whether published empirical studies on health and housing between 2011 and 2021 in Australia applied a human-environment system framework. The authors concluded that systemic and intersectoral thinking has been rarely used, even though it

is needed if the interrelations between health and housing are to be understood beyond the boundaries of discipline-based knowledge. This paper underlines that disciplinary confinement is still common in the field of health and housing.

The second paper by Thuy Thi Thu Nguyen and Michael Waibel (Contribution 2) analyzes whether health co-benefits are perceived by stakeholders of the Green Building Movement (GBM) in Vietnam. They present the findings of a large-scale household survey completed in a green building-certified project in Ho Chi Minh City, Vietnam, as well as six thematic webinars and expert interviews about this subject. The authors identified a challenging mismatch between the high importance homebuyers attribute to green building health benefits, whereas the focus of GBM professionals and suppliers is on energy-saving benefits and lowering carbon footprints, even though these are not prioritized by homebuyers. Therefore, the authors conclude that improved health and well-being should be more strongly considered as co-benefits of green buildings.

4.2. Health Co-Benefits of Public Green Spaces

Two papers in this issue discuss the positive health impacts of access to public green spaces in cities including the provision of community gardens. The first paper by Brenda Lin and her colleagues (Contribution 3) presents the results of qualitative research with professional practitioners that examined their opinions and understanding of the multiple biological, environmental, and social benefits of urban public parks including health co-benefits. The authors discuss the results of focus group research involving professionals in New South Wales, Australia, who provided and now manage public parks. The research identified how these professionals quantify and qualify the multiple benefits of urban public parks, and to what degree health co-benefits are considered at the same time as biological, ecological, environmental, and social benefits, as well as financial costs. This contribution highlights the importance of holistic approaches that acknowledge many interrelations between SDG 3 and SDG 11.

The second paper by Liling Huang (Contribution 4) presents the communal development process of a community garden in Taipei during the COVID-19 pandemic. This case illustrates the growing provision of community gardens and their relevance to urban health and human well-being. Previous studies have highlighted the contributions of community gardens for communal food supply, local climate adaptation, and supporting cultural and social activities. Using qualitative research methods, this case study demonstrates the symbiotic relationships between various factors and the synergetic effects they provide for physical and mental health. The author interpreted how community gardens can support and enhance place-based health concepts in a rapidly urbanizing world. The study illustrates the pathways through which interventions in urban neighborhoods can enhance urban health, and how this occurred from 2020 during the period of the COVID-19 pandemic. This intersectoral framework is essential to enlarge a disease- and mortality-centered approach that includes health promoting lifestyles and social well-being.

4.3. Action Research for Health and Sustainability in Urban Living Labs

Two papers in this issue present action research in Urban Living Labs in four cities. The authors of 'Comparing Societal Impact Planning and Evaluation Approaches across Four Urban Living Labs (in Food-Energy-Water Systems)' (Contribution 5) examined whether Urban Living Labs (ULL) are an effective setting to reduce the well-known gap between knowledge and practice in the field of foodenergywater nexus. The authors compared multiple approaches to impact planning and evaluation across four newly formed urban living labs in Sao Paolo (Brazil), Western Cape (South Africa), Bristol (UK), and Rotterdam (the Netherlands). Each of these cases sought to address urban challenges associated with the foodenergywater nexus. A comparison matrix and a disaggregated impact table were formulated and applied by the authors from a comprehensive review of key definitions. These new tools were completed by staff at each ULL alongside a post hoc pathway to societal impact statements. The main findings of this comparative research in four cities

include the importance of establishing clear shared definitions while accepting plural understandings of urban challenges including those that influence health and well-being.

The next paper titled 'Testing Food Waste Reduction Targets: Integrating Transition Scenarios with Macro-Valuation in an Urban Living Lab' presents a case study in Bristol (Contribution 6). This English city is seeking to achieve Zero Waste City status by 2049. The authors present intersectoral research that combines macro-economic valuation with transition pathway mapping and adapted participatory scenario planning to stress test ambitious food waste targets of the city of Bristol, England. The primary aim of the research was to improve understanding of who might be affected by achieving current targets to achieve Zero Waste City by 2049, both locally and nationally; and the potential scale of impacts, as well as potential barriers and policy opportunities. The valuation focuses on household and commercial food waste, combining available site and city data with national level proxies. Impact areas included changes in sectoral income, employee income, capital owner income, tax revenue, and carbon emissions. Four scenarios, based on two extreme cases, were modelled to consider food waste reduction and potential shifts in consumption patterns. The results indicate that current market and governance failures encourage waste and suggest potential routes to transition, including trade-offs and resource reallocation, alongside the need to acknowledge and respond to these profound structural barriers. With further development and testing, the approach may contribute to a better understanding of how local authorities can achieve socio-environmental targets that influence health and well-being.

4.4. Rethinking Basic Needs in Daily Life

Ivy Chumo and her colleagues have contributed their study of 'Unmet Needs and Resilience: Cases of Vulnerable and Marginalized Populations in Nairobi's Informal Settlements' (Contribution 7). The authors present the results of field research with low-income, marginalized households living in informal settlements in Nairobi, the capital city of Kenya. Their field research identified to what degree basic needs are met and whether there are negative health impacts when needs are not achieved. The authors applied Maslow's hierarchical model of human needs that includes physiology, safety, love, belonging, and self-esteem. Their research highlighted the advantage of using household surveys to record the daily activities of residents using governance diaries. This ethnographic approach can identify unmet needs that are not recorded by other sources of information. Hence, it is possible to better understand how poor households adapt to persistent unmet needs that define deprivation, and how this situation impacts on their health and well-being. More effective responses to unmet needs of marginalized and vulnerable groups in cities around the world are needed before the goals and targets of SDG 3 and SDG 11 can be achieved.

In many countries, including those with ageing populations and isolated rural communities, digital accessibility is considered a health need and objective for e-healthcare. Internet has become a common tool to both communicate and engage patients. Nikita Polukhin and colleagues present the results of a survey of adults' preferences for health information resources and the utilization of digital healthcare tools in Russia (Contribution 8). Data for this study were collected from an online survey conducted in August and September 2020 that included 1319 respondents. The survey found that those females who are more educated, and more active internet users, were more likely to use all available sources to gather information concerning their health. Almost one-half of the respondents reported that they did not use any digital tools to manage their medical appointments. Smartphones were more likely to be used by younger and more active internet users, while personal computers were prioritized as the preferable device to access the internet by males and older adults. The authors concluded that public health authorities and healthcare providers must provide a wider range of on-line information and digital interaction experiences that are pertinent for the needs and preferences of patients.

In their contribution titled 'Health and Environmental Co-Benefits of City Urban Form in Latin America: An Ecological Study' (Contribution 9), Ione Avila-Palencia and her

colleagues in Latin and North America studied the statistical association between urban landscape profiles, local environmental conditions, and the health of resident populations. The SALURBAL Project was conducted from 2017 to 2022. It applied quantitative research methods to analyze large urban databases for 208 cities in eight Latin American countries to study whether city landscape profiles having low fragmentation, high isolation, and compactness were most likely to yield positive health co-benefits. The authors identified positive correlations and then they provided robust data and information for future guidelines and recommendations about the interrelations between land-use, urban planning, and population health.

Another contribution in this issue is 'Health Impact Assessment to Promote Urban Health: A Trans-Disciplinary Case Study in Strasbourg, France' (Contribution 10). This paper describes an evaluative project method endorsed by the World Health Organization. Health Impact Assessment (HIA) should be applied to assess and, hopefully, improve land-use planning and the construction of urban infrastructure before proposals are approved for construction. This contribution presents the process and outcomes of the HIA of a large road infrastructure project on the outskirts of Strasbourg, France. The authors describe the HIA participatory method and its outcomes including the safeguards identified to protect the health and well-being of residents impacted by this infrastructure.

Finally, 'Sustainability and Equity in Urban Development (S&EUD): A Content Analysis of "Bright Spots" from the Accelerating City Equity (ACE) Project' is the title of the last paper (Contribution 11). In this contribution, Nishita Dsouza and her colleagues at the International Society for Urban Health (ISUH) emphasize that equity is a core principle of the 5P framework for Sustainable Development endorsed by the United Nations (presented earlier in Section 3.1 of this paper). The authors explain why it is applicable and pertinent for the assessment of urban development policies and projects. This contribution presents the content analysis and findings of published case studies included in the Accelerating City Equity (ACE) Project. This contribution identified the positive drivers of those projects that improved equity in cities. These positive outcomes include the interrelations between urban development projects and public initiatives that reduce inequalities and equity while having positive and negative impacts on population health.

5. Conclusions

This introduction to this Special Issue of Sustainability has described and illustrated innovative contributions towards achieving the United Nations 2030 Agenda for Sustainable Development by programs and projects that jointly implemented several goals and targets of SDG 3 and SDG 11. Many of these contributions have bypassed the inertia of national authorities and government policies by interventions at the level of communities and local authorities. They confirm that cities and local government have the potential to create adaptive responses to urban health challenges, rather than being considered as the overriding cause of many current environmental, economic, health, and other social problems [34,36].

The innovative contributions in this Special Issue illustrate the need to reexamine urban lifestyles and infrastructures from three complementary perspectives: an integral systemic perspective at the level of cities and urban regions; an individual and household perspective at the level of residential buildings and neighbourhoods; and a socio-technical/institutional perspective encompassing the local, regional, and national levels. The 17 SDGs and their 169 targets should be applicable at these different geo-political levels which are core layers of socio-ecological systems.

The contributions in this Special Issue challenge common interpretations of rapid urbanization borrowed from traditional development agendas that focus narrowly on economic growth and industrialization and largely overlooked unintended consequences for the health and well-being of current and future generations. In contrast, relational thinking about the multiple interrelations between the components of natural and human-made ecosystems is much needed because they are related directly or indirectly to urban

and planetary health. In essence, these principles should be applied in specific cities and urban neighbourhoods to improve and sustain the physical and mental health of current and future generations.

This introduction has presented a wholistic interpretation of urban health and explained the need for this kind of thinking if the sustainable development goals (SDGs) are to be applied effectively to promote and sustain the health of urban populations. It has discussed and illustrated why the interrelations between SDG 3 'Good Health and well-being' and SDG 11 'Sustainable Cities and Communities' should be clearly identified by intersectoral collaboration between citizens, professionals, politicians, and researchers. The next step concerns all.

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