

A systems approach to urban health and wellbeing to meet the sustainability challenges of urban change

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Introduction

Cities are now humans' dominant habitat. They are complex systems (Batty 2013) in which a large number of environmental, social, cultural and economic factors have an impact on human health and wellbeing. Urbanization is challenged by opportunities for achieving human health and wellbeing which makes it a highly relevant vehicle towards achieving the Sustainable Development Goals.

Currently there is limited understanding of the complex causal processes that shape urban population health and wellbeing. Food, nutrition, waste, transport, infrastructure, housing, employment, education, energy, safety and access to health care and other urban public services are interdependently linked to health and wellbeing in cities (ICSU 2011).

Many health outcomes are consistently linked with each other and are thus referred to as co-morbidities (ICSU 2011, Michelson et al. 2000), e.g., many patients suffer simultaneously from obesity and diabetes and depression. Grmek (1969) argued that diseases should be studied in relationship to one another and introduced the concept of pathocenosis, which proposes that the existence and spread of any specific disease depends on the existence and spread of all other diseases in society.

Syndemic is a related concept in which health-related problems cluster for particular reasons (Singer and Clair 2003). The first syndemic to be described consisted of violence, substance abuse, and AIDS in poor inner-city populations facing an array of political-economic and social

challenges – unemployment, poverty, substandard housing or homelessness, poor nutrition, disrupted family and social relationships and little or no access to health care (Wallace, R., 1988; 1990; Wallace, D., 1990).

Non-infectious diseases like obesity, diabetes and depression can be seen as syndemics associated with a lack of exercise, poor nutrition, poor education and food consumption culture (Leon 2008). To prevent or reverse a syndemic, one must prevent or control the forces that tie the co-occurring conditions together. As we enter the urban age this systemic knowledge now receives new significance.

New urban sustainability challenges

New urban sustainability challenges occur because of the increasing trend of urbanization and the challenge of adapting urban system functions to new urban environments and lifestyles. They include but are not limited to increasing risks of communicable and non-communicable diseases, accommodation of growing populations and challenges of migration, risks of safety and security, the lacking consideration of health issues in urban planning, and adjustments to aging urban societies.

Although improved healthcare and sanitation has generally reduced mortality rates (WHO 2015) health concerns in high and low income countries alike have shifted towards so-called lifestyle diseases, as a result from e.g. increased salt and energy-dense food

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consumption, paired with a lack of physical activity, causing hypertension and obesity, leading to increases in heart disease, stroke, certain cancers and diabetes (Mendez and Popkin, 2009).

Research on urban biodiversity, e.g., demonstrates the positive health effects between exposure to certain micro-organisms (such as bacteria, fungi, protozoa, and helminths, commonly found on animals, plants, the air, soil, building materials of houses or on the human skin) and the development of the human immune system (Rook 2010, Rook et al. 2014). Absence of this microbiota increases susceptibility to chronic inflammatory diseases, cardiovascular disease, and some forms of inflammation associated depression (Rook et al. 2013).

The inseparability of people from their ecosystem is becoming increasingly clear in urban areas and has led to “ecosystem health disorders” –biological errors, dysfunctions or illnesses related to maladaptation to or malfunctioning of urban ecosystems. They range from pollutants in air, soil and water, reduced diversity of food consumption and malnutrition, sleeping and biorhythm disorders, disturbance of the immune system, allergies and risk of antibiotic resistance and social determinants of health (Wahlqvist 2006, 2014; Lin et al. 2009, Huang et al 2013, Kawachi et al 1997, WHO 2011).

With urbanization we have changed our shared biology. “The interfaces between us and our environment (...) comprise time, biorhythms, prokaryotic organisms, sensory (auditory, visual, tactile, taste and smell).” (Wahlqvist 2014). Rapid ecological, climatic, epidemiological and population changes could overwhelm our attempt to sustain human health in cities if we do not manage to take more ecologically integrative, interdisciplinary, cross-sectoral and collectively intelligent approaches to urban health.

There is an urgent need to develop innovative, systems approaches to understand the

relationships of urban ecosystem functions and health and well-being. The Millenium Assessment (MA 2015) and other studies recognize ecosystem services being essential for health and wellbeing (Sandifer et al. 2015, Ranganathan et al. 2010).

Given the novelty of systems approaches in the study of population health and the city, the International Council of Science (ICSU) programme promotes a “systems approach” to the science of Urban Health and Wellbeing. It encompasses modeling of complex inter-relationships and the inclusion of society in knowledge creation.

Urban health and wellbeing for sustainable development

A major proportion of global economic growth is driven by the economic potentials of cities. Therefore, in order to achieve global sustainable development, urban development needs to be “healthy”. Human health at the expense of planetary ill is not sustainable as both depend on each other (Whitmee et al. 2015).

For those reasons the members of the scientific committee of the ICSU global interdisciplinary programme on “Health and Wellbeing in the Changing Urban Environment: a Systems Analysis Approach” have adopted the following statement:

XIAMEN STATEMENT ON SYSTEMS THINKING FOR URBAN HEALTH AND WELLBEING

The ICSU global interdisciplinary programme, Health and Wellbeing in the Changing Urban Environment: a Systems Analysis Approach, recognizes that:

Cities and other urban settlements are expanding rapidly, and are both the predominant human habitat and the future of humanity;

Cities and the processes of urbanization offer great opportunities for health and wellbeing but also present challenges to health,

including the emergence of broad social and geographic inequities;

Health and wellbeing in cities and other urban settlements are affected by an array of dynamic factors and changing relationships, which are in turn influenced by decisions at all levels, from formal policies to individual actions;

To realize the potential benefits cities have for health and wellbeing, we must understand them as interrelated systems that provide functions and generate health outcomes. Novel conceptualizations, methodologies, and ways of producing knowledge are needed that explicitly account for complexity. Systems approaches are necessary to capture the dynamic relations between policies, environments and people that change patterns of health and wellbeing in cities;

The knowledge produced using systems approaches is most often useful and effective when it is co-produced by scientists from multiple disciplines, policy makers, planners, managers, and civil society;

Given rapid urban growth, and complex health problems in cities and other urban settlements, systems approaches are vital to assure and improve human health and wellbeing and secure a sustainable future for all people and our shared planet.

Improved knowledge generated by real partnerships will allow us to act to maximize health and wellbeing in cities.

We call upon the scientific community, policymakers, planners, investors, civil society groups, interested individuals and other stakeholders to work together in a spirit of partnership to adopt systems approaches and generate new knowledge that will maximize the health benefits and improve wellbeing associated with urbanization.

Investing in research which investigates the systemic relationships between human health and urban ecosystem services and promoting

health and ecosystem service knowledge in urban planning are important first steps.

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