A CROSS-DISCIPLINARY OVERVIEW OF HEALTH CONCEPTUALISATIONS TO AID URBAN HEALTH RESEARCHERS AND PRACTITIONERS

Author:
TAMARA AL-OBAIDI

Affiliation:
UNIVERSITY OF TECHNOLOGY SYDNEY, AUSTRALIA

INTRODUCTION

The way researchers understand and conceptualise health within urban environments has seen a significant transformation over the years. This is attributed to how researchers have approached the increasingly complex, diverse and interconnected factors, challenges and trends affecting health and wellbeing. Numerous social, environmental, biological, economic, political, and cultural aspects can affect the health and wellbeing of populations within a worldwide web of complex and interconnected urban settings on multiple levels and contexts. As a result, various conceptual and theoretical framings of health exist today influencing the way urban health researchers understand and approach health and wellbeing. This could be a confusing endeavour, especially for urban health research students, early career researchers and practitioners who need to understand how best to approach urban health with better conceptual grounding. With an ever growing number of cross-disciplinary research material in this area, the literature can easily become confusing and lacking conceptual and theoretical rigour. Here we provide a useful mapping of the different lenses researchers have utilised to conceptualise and theorise about their understandings of health, especially as these relate to urban environment. By organising the literature into five distinct conceptual lenses of health (as illustrated in Figure 1), the perspective piece provides a clear reference point that will assist the urban health research community.

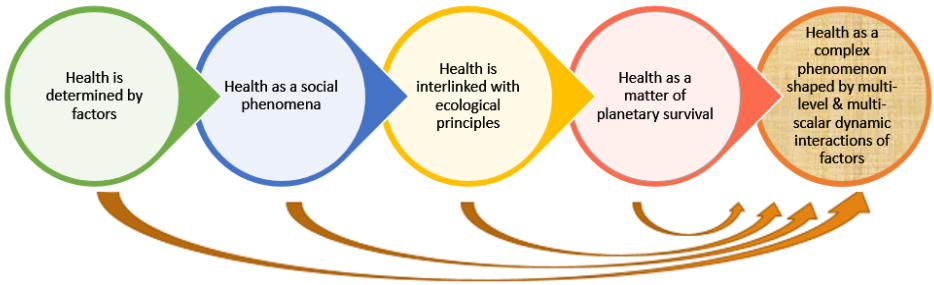

Figure 1. Five overarching conceptual lenses of health

THE INFLUENCE OF HEALTH PROMOTION (HEALTH IS DETERMINED BY FACTORS)

Health promotion movements and actions have played a role in moving conceptualisations of health beyond biomedical views. According to the biomedical perspective, health is about the body's biological existence where it is either diseased or not, hence healthy or not. [1] In other words, disease was not considered within the context of the lives of people who have it. This is when early health promotion movements became key in contextualising health.

The World Health Organisation's (WHO) landmark definition in 1948 of health as *"a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity"*[2] promoted health beyond the absence of disease perspective. The definition moved health away from a separation between the mind and body.[3] It also broadened the scope of health beyond disease prevention. Hence, an appreciation of health determinants started to develop.

Through the Canadian health promotion focused Lalonde report in 1974, the sole role of healthcare as the central resource for producing health was challenged. Instead, the role diverse interdependent determinants play in producing health was acknowledged. In addition to the health care system, the concept of health included the interdependency of three other broad aspects namely: biology, lifestyle, and the environment (both physical and social). [4]

This complexity of societies and the environment in their impacts on health was also acknowledged by the Ottawa Charter for Health Promotion (1986) adopted at the first conference on health promotion in Canada in 1986. [5] The Charter advocated for a 'socioecological approach' to health based on their views of inseparable links between people and their environment. Reciprocal maintenance by taking care of eachother, our communities, the natural environment, and the conservation of natural resources was seen as imperative to the health promotion agenda. Hence, fundamental conditions and resources, including peace, shelter, education, food, income, stable ecosystem, sustainable resources, social justice and equity were established as pre-requests to health along with a systematic assessment of health impacts from urbanisation.

Through views of health as promoting, the role of different determinants in producing health, wellbeing and disease have become apparent. Thinking shifted to an understanding of health as being created out of interdependent factors.

THE INFLUENCE OF SOCIAL JUSTICE AND SOCIAL CONDITIONS (HEALTH AS A SOCIAL PHENOMENON)

Addressing the social conditions (determinants) of health and disease advocated by the health promotion movement was brought into sharp focus, especially following the landmark commission by the WHO on the Social Determinants of health (SDOHs) in 2010. Social epidemiology theories explained how differences in social position account for health inequities.[6] Health became an outcome of a social patterning of health and disease[7] stratified in the population through structural and intermediate determinants examined from a health equity lens.[8]

Social epidemiology theories brought the focus on the social and biological conditions that shape population health[9] despite notable differences in their respective weight on these conditions in shaping health and how they integrate social and biological explanations.[10] Nonetheless, they all represent what Nancy Krieger termed *"theories of disease distribution"* where mechanism-oriented theories of disease causation are presumed but equally not reduced to them alone. [11]

In particular, Krieger's ecosocial theory along with two related multi-level frameworks: the eco-epidemiology framework/theory by Mervyn Susser dated 1996 and the social-ecologic systems perspective/framework introduced by Anthony McMichael dated 1999; integrate social and biological

reasoning. They also integrate a dynamic, historical and ecological view to explain patterns of health, wellbeing and disease among populations and social inequalities in health.[12]

Rather than simply reinterpreting factors identified by one approach (e.g. biological) in terms of another (e.g. social), the frameworks envision a more systematic integrated approach.[13] Krieger's constructs of embodiment, pathways of embodiment, cumulative interplay between exposure, susceptibility and resistance, and accountability and agency explain structural barriers to health beyond biomedical and unhealthy lifestyle choices approaches.[14] Their goal is to answer the question of who and what drives existing and altering patterns of social inequalities in health.[15] Hence, it fully embraces a social production of disease perspective. McMichael's social perspective relates to population properties, including history, culture, and socioeconomic relations as key aspects in determining the level and internal distribution of disease risk.[16]

The two frameworks bring analysis that extends understanding beyond 'proximate', individual-level factors alone and into the large context where the complexity of life is recognised. Causal processes might not necessarily be linear and sequential and may involve interactions and feedbacks.[17] With the use of ecological notions, literally not just metaphorically, the two frameworks also part company with other theories. They situate humans as one type of species among others that cohabit, evolve and alter our dynamic planet.[18] Clearly demonstrating a shift in research thinking that took advantage of ecology, systems and complexity thinking and science in order to understand health, wellbeing and disease causation and impacts on individuals and populations.

ECOLOGICAL FOUNDATIONS OF HEALTH (HEALTH INTERLINKED WITH ECOLOGICAL PRINCIPLES)

The terms 'eco' and 'ecologic' in both Krieger and McMichael's frameworks revealed an influence of Ecology which examines interrelations between living things in connection with their environment.[19] By ecological terms, attention is drawn to contexts where interdependencies exist between individuals and groups of humans and their environment.[20] Principles of scale, levels of organisation, dynamic states, complexity modelling, and understanding uniqueness of population similarities and differences also became key to understanding health and disease. [21]

The influence of Ecology on health is not merely viewed in respect to its principles, hence in what ecological thinking and analysis can bring. Health is not only contingent upon connections with multiple factors, but also upon other life forms.[22] In this context, ecological public health also brings attention to dependencies between human health with the natural world and coexistence with this world.[23] Instead of thinking about the environment as a source of exposure to hazards, ecological thinking forces thinking of the environment as living human habitats.[24]

Ecological thinking sees each 'living' level as a function of complex systems where the whole is greater than the sum of its parts.[25] Ultimately, human health and wellbeing would depend on us being part of ecosystems and the natural environment.

By bringing these ecological principles, understanding health within urban environments becomes attuned to interdependencies, population processes and multi-level causality-typical of systems thinking.[26] Coexistence with the natural world demands a non-separation between social systems and natural systems, as natural systems do not exist without people and human systems cannot be isolated from nature.[27] Hence, ecological foundations of health put an emphasis on the interwoven nature between the social and ecological interactions—in other words the 'social-ecological intertwinedness'.[28]

Systems and complexity science thinking brought important implications to the social-ecological systems perspective. In relation to health, systems thinking brings a way of looking at interactions

through a web of interrelated and interacting components.[29] Owning to the complexity of social and environmental settings, systems are considered as being in constant change, can reach equilibrium but equally may change in random ways, occur in repeating chains or circuits of cause and effect, and can be adaptive or reach a tipping point when balance is compromised.[30] Hence, systems have dynamic, unpredictable and adaptive properties, and are underlined by feedback loops. Complexity brings nonlinearity and bidirectionality between parts where temporal and spatial boundaries become merely social constructions. Within these complex interactions between humans and their environment, a large number of heterogeneous elements of the systems continuously interact leading to positive and negative feedbacks. This leads to emergent behaviours where different parts influence each other resulting in consequences viewed as small changes that lead to surprises of large and unpredictable effects.[31]

By gaining new insights into the complex social and environmental systems that are context for health and disease, causal ways of thinking and knowing were broadened.[32] Thereby, "*the important ecologic dimensions of social-environmental influences on health and disease"* were recognised.[33] These systems are viewed as interconnected and coevolve across spatial and temporal scales, whereas the trajectory of the system and its degree of resilience is influenced by the social and ecological dynamics and properties.[34] Ultimately, health becomes dependent on resilience—the capabilities of the systems to absorb disturbances and undergo change.

THE INFLUENCE OF SUSTAINABILITY (HEALTH AS A MATTER OF PLANETARY SURVIVAL)

Considering health and wellbeing in light of sustainability—a concept that is focused on preserving health in future terms and, in turn, the viability of the human civilisation[35]—have seen a surge, especially within the last decade demanding urgent actions. Researchers argue that humans are altering fundamental earth processes, including the climate, river flows, the cycling of materials, and other aspects related to Earth's natural systems and resources.[36] This shift has been highlighted by many reports and global assessments[37] warning that global human health is being increasingly and severely threatened due to the accelerating change to the structure and function of the Earth's natural systems if steps are not taken to rectify the situation.[38]

This reiterates warnings previously echoed by the WHO in 2003 and 2005 following their Millennium Ecosystem Assessment (MEA).[39] The assessment showed that 60% of ecosystem services examined (the essential services that ecosystems provide for people) are being degraded or used unsustainably.[40] Urbanisation, and its impacts through urban development was considered one of the major pressures causing direct and indirect health impacts.[41] Other events and key actions have also brought attention to the links between human health and sustainability both implicitly and explicitly. Prominent events and actions included, the Brundtland Report, the UN's Millennium Sustainable Development Goals (SDGs) and summit on sustainable development in 2002, the 1992 UN Conference on Environment and Development, and the Rio Declaration and Agenda 21.[42] Through these events, what sustainability stands for started to take shape within the research community.

Sustainability is concerned with *"the ability of a system to continue functioning without depleting or damaging the things it needs to function".*[43] Primacy is given to environmental concerns where Earth systems and ecosystems are preserved to maintain human health and wellbeing in sustainable ways.[44] Health gains cannot be achieved at the expense of ecosystem services on which humanity's coexistence depends. Being part of this social-ecological coupling requires the consideration of long-term system resilience. Therefore, health became *"the health of human civilisation and the state of the natural systems on which it depends".*[45] This planetary health conceptualisation aims to address the

political, social and economic systems that interfere with health, equity and wellbeing to a level that civilisation collapse is becoming inevitable.[46] In this context, researchers argue that human and nature sustainability should be unified.[47] Ultimately, human biology and the collective human ecology, hence health, depends on the stability, productivity, and resilience of the natural environment.[48]

THE INFLUENCE OF COMPLEXITY (HEALTH IS COMPLEX)

The complexity of the social and environmental systems as context for health and disease with humans being part of an organic web of species brought fundamental changes on how health is conceptualised. The discourse on health and determinants of public health is changing. Different research fields, including medicine, public health, social epidemiology, and population health are taking advantage of complexity science and systems theory. McMichael[49] linked this shift in mindset to the way one ought to understand health and disease causation. Thinking about health in social-ecologic systems terms extends our space-time frame of reference from modular to a life-course view.[50] It also means an understanding of the determinants of health beyond proximate, individual-level influences alone to broad, population-level focal lengths.[51]

Whether individual or population health focussed, researchers are increasingly viewing patterns of health outcomes as 'emergent property' from multi-level and multi-scale interactions among heterogeneous components of Complex Adaptive Systems (CAS).[52] Instead of isolating causality from separate factors alone, attention shifted to relationships between parts and determinants whereby how the system is comprehended as a whole.[53]

Health becomes a manifestation of a system where, *"biology interacts with environments and individuals interact with each other and with environments over time"*[54] giving rise to states and patterns of health. This makes health a dynamic continual outcome of many processes as supposed to a static state of existence.[55] As a response, a high degree of adaptive capacity can develop that leads to resilience and the capability to cope with ongoing and future challenges resulting in states of health.[56] Otherwise, states of disease and negative health impacts would ensue where systems' parts and determinants become insufficient to respond to life's demands.

It is important to note that conceptualising individual and population health as complex have shifted recent narrative within the healthy urban environments literature. In response, research in this area is witnessing a worldview revolution from purely reductionist cause and effect-based discourse to a complexity-based one. This is attributed to emergent behaviours from complex systems and challenges currently being manifested within urbanised areas.[57] The numerous urban and nonurban-related challenges, determinants, factors, and systems' parts are inspiring urban researchers to think beyond reductionist, linear, and hierarchic frameworks of health conceptualisation alone.[58] In addition, the deteriorating natural environment with all its fragile interlinked systems along with the loss in biodiversity are prompting the need to consider the issue of the sustainability of population health in ecological terms.[59] Consequently, managing population health becomes about being adaptive and continually evolving in order to ride these challenges in the sense of an evolutionary process.[60]

This implies that both urban environments and human health are multi-faceted, diverse, complex and evolving.[61] Urban health researchers are now conceptualising urban environments (e.g. cities) as CAS in order to understand the complexities involved in urban environments-human health interactions. Sarkar and Webster[62] explained how health and disease self-evolve in 'space-time' as a result of complex dynamic non-linear interactions between biological and environmental factors. These factors function at multiple levels (at the cellular, molecular, individual, population and societal levels of the organisation) as well as different contextual scales (e.g. cities and neighbourhoods).[63]

CONCLUSION AND FUTURE TRENDS

Conceptualising health within urban environments as complex has revolutionised the research on healthy urban environments. Researchers involved on healthy urban environments now advocate for cross-disciplinary research (e.g. transdisciplinary and interdisciplinary research), systems approaches (e.g. coupled social-ecological systems approaches), multi-level and multi-scale analytic techniques, data and future-scenario modelling, and long-term monitoring and database development. In addition, various approaches in the form of frameworks, models and mappings have been developed to help advance knowledge in practice, whether concerning policy, intervention, assessment or understanding of health conceptualisation within the urban environment. This area of research is fast-moving, and recent publications suggest that researchers are beginning to adopt a complexity of health conceptualisation in relation to the urban environment to aid understanding and practice.

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