URBAN HEALTH
AND WELLBEING
A SYSTEMS APPROACH

POLICY BRIEF

A systems approach to urban health and wellbeing has come of age

in the Asia-Pacific region

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Experiences with a systems approach to urban health and wellbeing in the Asia-Pacific region underline the need to:

1. Understand and underscore the centrality of health in development by formalizing links between health and other sectors.

2. Move beyond simple indicators to a recognition of the consequences of complexity, and particularly of the dynamics of causal feedback loops.

3. Identify important cross-sectoral synergies and tradeoffs.

4. Promote inter- and trans-disciplinarity in science through new funding and evaluation criteria.

5. Create mechanisms and structures to improve the science/policy interface.
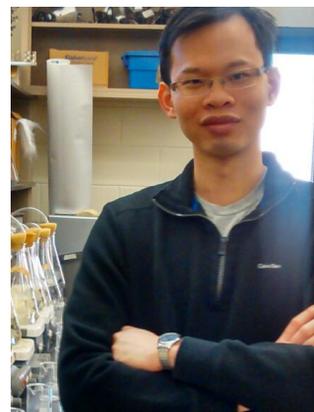
About the authors

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Policy Context

The Asia-Pacific Region (Figure 1), home to more than half of Earth's population (UN-DESA 2017), is experiencing urban growth at unprecedented scales; urban land, for example, increased by >22% (equivalent to the area of Taiwan) and urban populations by >31% in East-Southeast Asia in just the decade from 2000-2010 (Schneider et al. 2015).
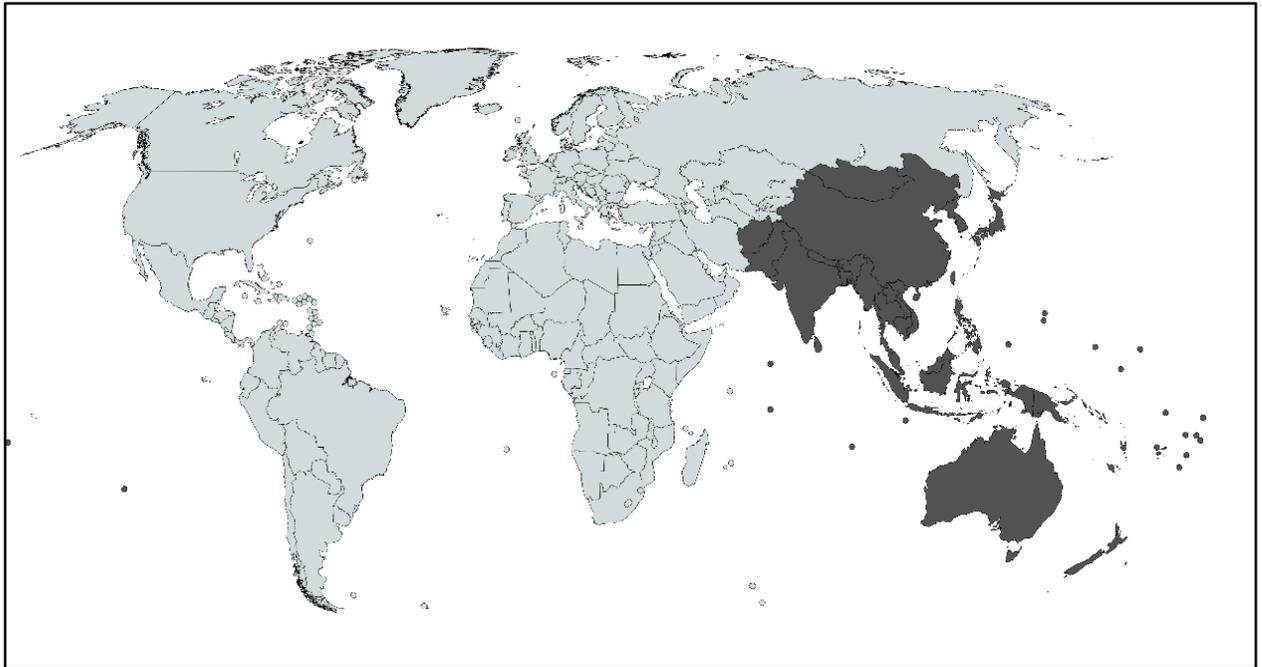

Figure 1: The Asia-Pacific Region. Created on: www.mapchart.net

This extraordinary expansion entails a parallel increase in complexity, a natural consequence of the proliferation of governance entities needed to deal with growing cities, the multiplying interconnections between elements of urban systems (e.g., people, firms, infrastructure, and institutions), the physical expansion of urban areas, and advances in technology that magnify the impacts of individual actors (e.g., telecommunications, transport), among other factors. Urban complexity involves interlinked causal feedback loops that are rarely perceived in whole by those involved. As such, policy decisions have numerous impacts beyond their intended effects; the former often outweigh the latter, leading to policy surprise or failure (Newell and Proust 2018). Moreover, because impacts can have significant delays, and because all actions are taken in the context of many simultaneous decisions, it is difficult to evaluate the efficacy of any particular policy or intervention.

Complexity is thus a significant factor in adverse urban health outcomes. For example, the growing prevalence of non-communicable diseases (NCDs) is at least in part a consequence of the complexity of their environmental, behavioral and physiological causes, which pose challenges for prevention and control (Lee et al. 2017). NCDs are now the most significant cause of deaths and disease burden in the Asia-Pacific region (Low, Lee, and Samy 2015). Changes in agricultural, behavioral and ecological dynamics and human-animal interactions in urban areas also imply complex new infectious disease risks (Hassell et al. 2017)—indeed, urban expansion in Asia has been tied to higher risk of highly pathogenic avian influenza (Saksena et al. 2017) and most new influenza subtypes and strains of seasonal influenza have originated in the region (Wen, Bedford, and Cobey 2016).

The unique challenges of Asian urban expansion are driving novel approaches to urban planning and management (see, e.g., Baculinao 2017); it is critical that such approaches account for complexity as it relates to health outcomes. Systems approaches are a set of actions intended to improve decision-making in such contexts. Fundamentally, they consist of two related elements: a) analytic methodologies to uncover feedback relationships and other non-linear elements of causal systems; and b) broad processes of engagement (interdisciplinary, transdisciplinary and multiscale) to improve problem characterization and ensure feasibility and buy-in (Siri 2016).

The need for systems approaches to complex problems, including in urban health, is implicit in the ever-more-integrated nature of platforms for sustainable development, most notably the Sustainable Development Goals (SDGs). It has been explicitly recognized in the academic literature (see, e.g., Bai et al. 2016; Newell and Siri 2016; Yang et al. 2018; Ramaswami et al. 2016), and is beginning to emerge in national and regional policy documents. The following section highlights an example of the application of systems approaches in Malaysia—the SCHEMA project—and offers a set of basic policy recommendations.

The SCHEMA project

Since 2016, the United Nations University International Institute for Global Health (UNU-IIGH) and the Cardiff University Sustainable Places Research Institute (CU-PLACE) have co-led the SCHEMA project to promote more effective decision-making for urban health and sustainability in Malaysian cities: "Systems Thinking and Place-Based Methods for Healthier Malaysian Cities," funded by the British Council's Newton-Ungku Omar Fund.

SCHEMA draws on the Collaborative Conceptual Modeling (CCM) framework developed by Newell and Proust (2018) at Australian National University (Figure 2), which uses simple system dynamics models to help participants visualize systemic structures and non-linear relationships, and to improve communication and generate shared understanding (Newell and Siri 2016).
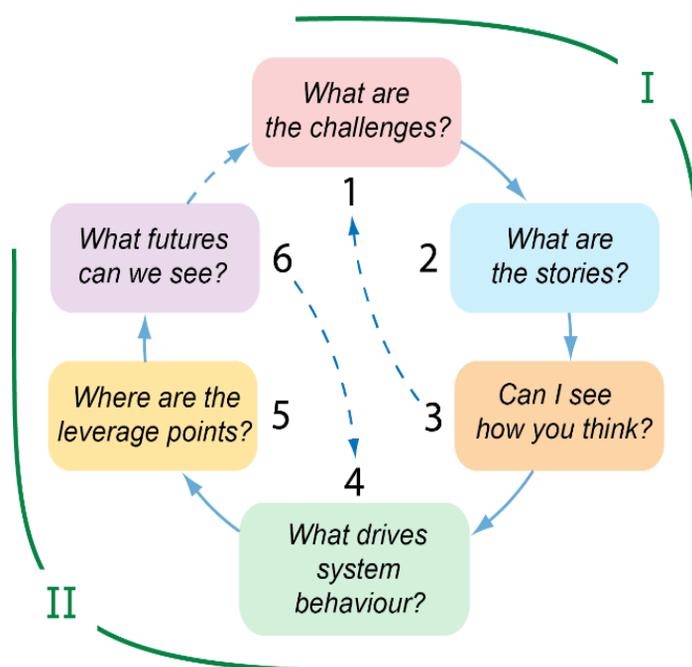

Figure 2: Collaborative Conceptual Modeling framework. Source: Newell and Proust (2018).

At the core of the SCHEMA project is an effort to develop a community of practice for systems approaches across the Malaysian government, academic, civil society and private sectors, and to enable and encourage this transdisciplinary group to apply such approaches jointly in addressing health and sustainability challenges. To this end, it has applied various methodologies.

First, the project implemented a series of transdisciplinary workshops focused on methodological capacity-building, cross-domain information exchange in thematic areas relevant to Malaysian cities—including green infrastructure, food systems, and campus sustainability—and exploration of structural and mechanistic factors that affect outcomes. These workshops were oriented toward the development of concrete proposals for new research collaborations, urban interventions, and organizational structures and mechanisms.

Second, the project led the co-production, with external authors from the SCHEMA community, of a series of case studies (SCHEMA 2018a) on complex urban problems related to health and/or sustainability. These case studies, developed through an iterative process of exchange between UNU researchers and outside partners, are simultaneously a capacity-building tool (i.e., for the use of causal loop diagrams and participatory model-building) and an illustration of the value of systems methods for revealing fundamental causes, the potential impact of contrasting perspectives, and leverage points for intervention.

Box 1: Selected examples of systems approaches for urban health in the Asia-Pacific

- Singapore-based Zeroth Labs blends methods from anthropology, data analysis, human-centered design, system dynamics, scenario planning and behavioral science to co-create new forms of public services or citizen solutions. They work "across a range of social issues, including sanitation, waste management, youth, education, and healthcare." (Chandran 2017).
- Through the Coastal Cities at Risk (CCAR) project's work in metropolitan Manila in the Philippines, "systems thinking about climate change adaptation have been mainstreamed in national and local government processes through specific policy instruments in collaboration with the all-levels of government, the military, regional scientific groups … and private sector partners" (McBean, Cooper, and Joakim 2017).
- Victoria, Australia's Food-Sensitive Planning and Urban Design report took an implicitly systems-based approach, "… draw[ing] on insights from academia, governance and practice in the disciplines of planning, urban design, sustainability and health," considering all phases of the food system and the roles and competing objectives of a diversity of stakeholders (Donovan, Larsen, and McWhinnie 2011).
- Since 2006, the Disha India Education Foundation has worked with over 50 schools across India to "…integrat[e] systems thinking principles and habits in the school curriculum and pedagogy," and promote experiential learning.
- The Tsinghua-Lancet Commission Report on Healthy Cities in China highlights the need for participatory systems-based efforts in developing China's urban future, explicitly calling for "transdisciplinary, interconnected, integrated and inclusive approaches—systems approaches—to deal with complex health challenges" (Yang et al. 2018).

Third, SCHEMA developed and disseminated outputs to promote systemic thinking about urban complexity among lay people. For example, the project co-sponsored a photo competition with Think City, a Malaysian community-based urban regeneration organization, to inspire recognition of linkages among the Sustainable Development Goals. This was published as "THRIVE Connect: Linkages in Everyday Life," (SCHEMA 2018b) and launched at the 9th World Urban Forum (WUF9) in Kuala Lumpur. In the same vein, project researchers brought systems thinking messages to the public through a series of seminars, public talks, and exhibitions, leveraging international events such as WUF9 and platforms provided by Think City and other policy, research, and academic partners. These presentations drew on common experiences in urban life, demonstrating how these shape and are shaped by larger social-ecological systems.

Finally, the project has produced focused research on topics relevant to urban health and sustainability in the Malaysian context (e.g., the adoption of climate-sensitive buildings to mitigate the health impacts of urban heat (Tan, Gong, and Siri 2017)), drawing on the same systems methods promoted throughout.

The SCHEMA experience has demonstrated the potential for systems approaches to aid in developing and communicating holistic understanding of complex urban health challenges. It has also revealed the need for institutional structures and mechanisms to enable the cross-sector interfacing required to fully utilize these understandings.

SCHEMA is but one of many initiatives in the Asia-Pacific now adopting and adapting systems approaches for urban health (See Box 1). Moreover, incipient large-scale efforts like China's Belt and Road Initiative and India's Smart Cities Mission offer possibilities for much wider adoption of systems approaches across the Asia-Pacific region, as does the broad program of action sponsored by the Asian Development Bank.

Policy recommendations

Drawing on experiences from the SCHEMA project and other systems-based work in the region, we suggest the following concrete recommendations for actors working to improve urban health in the Asia-Pacific:

- Understand and underscore the centrality of health in development, adopting formal requirements for cross-sectoral engagement. The World Health Organization has emphasized that effective health promotion requires action across all sectors (WHO 2014) and that good health is a precondition for the achievement of sustainable urban development (WHO 2016). Effective health messaging can powerfully motivate action, and in many contexts, health sector representatives (e.g., doctors) are trusted voices. Conversely, "non-health" expertise, including traditional and local community knowledge, has much to offer to the design and implementation of public health interventions.
- Move beyond simple indicators. While straightforward quantitative indicators are critical for benchmarking progress, decision-makers should at the same time strive to identify the important feedback loops, especially cross-sectoral feedbacks, that underlie health challenges. Thinking through feedback relationships will help actors to articulate theories of change and the expected pathways along which change will occur. In this manner, deviations from expectations can be more readily monitored, recognized and addressed.

- Identify important cross-sectoral synergies and tradeoffs. The International Council for Science recently published a framework for evaluating interactions among SDG targets (ICSU 2017), which can be viewed as a preliminary step towards a systems-based approach to sustainable development. At a time when many resources are growing scarce and increasing recognition of anthropogenic pressure on planetary systems dictates that others be conserved, it is especially critical to adopt actions that yield co-benefits and don't work counter to their own purposes.
- Promote inter- and trans-disciplinarity in science, including through new funding and new criteria for evaluation of scientific proposals and outputs. Large-scale initiatives in the region, such as China's Belt-and-Road Initiative and India's Smart Cities Mission, along with major development actors like the Asian Development Bank, have the opportunity to change the conversation by adopting systems thinking as a working paradigm.
- Create mechanisms/structures to improve the science/policy interface. There is a need for ongoing, long-term, close engagement between academics and policy-makers, a need that cannot be met solely through the production of policy-oriented documents as per standard practice, or by ad hoc one-off meetings dedicated to "knowledge transfer". One avenue to facilitate such engagement would be the promotion of systems thinking in secondary education; priming future generations to receive and engage in systems-based messages has the potential to significantly improve decision-making for health. A second avenue is participatory budgeting, which establishes a formal ongoing mechanism for policy-community interactions.

References
Please contact the authors for a complete reference list

The *Urban Health and Wellbeing: a Systems Approach* (UHWB) programme, is a global science programme, of the International Council for Science (ICSU). The vision of the programme is: cities functioning as integrated complex systems which sustainably provide benefits for the health and wellbeing of its residents. It aims at (1) promoting and coordinating research, (2) developing and identifying data needs, (3) building and strengthening capacity and (4) communicating new knowledge.

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The Policy Briefs of the UHWB programme aim at highlighting and drawing attention to policy relevant findings and insights from research and researchers and communicating them with decisionmakers at all levels of society in order to encourage the co-creation of knowledge for healthy urban environments and people.