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Xiamen Call for Action: Building the Brain of the City—Universal Principles of Urban Health

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The question of how to achieve healthy, sustainable urban futures demands a singular emphasis. The scale and rate of change of modern urbanisation is unprecedented—so much so that it threatens the health gains of the past century. Urbanisation is the greatest ecological shift in human history, and in modern times has attained dimensions never seen before. We have mere decades to enact the greatest transformational change the planet has ever seen, if we are to safeguard a sustainable future. Indeed, the scope, scale, and ambition of transformative efforts need to accelerate dramatically, if humanity is to achieve sustainability before being overwhelmed by global change.

Most people now live in urban centres, which are responsible for 85% of global economic activity and 75% of greenhouse gas emissions. The effects of urban lifestyles on health and wellbeing vary widely, and are affected by wealth, social status, and specific features of the urban environment [1]. In high- and middle-income countries, urban health threats include air and environmental pollution, noise, disincentives to physical activity, absence of green space, and in some cases social exclusion, mental health issues, and poverty. Cities in low-income countries confront all these problems, compounded by critical shortages of infrastructure (potable water, sanitation, electricity, waste management, and transport), uncertain land tenure, poor governance, and other challenges [2–6]. Climate change adds a new worrying dimension to urban challenges—for example, cities are already subject to urban heat island effects, which will intensify [7]; risks from climate-related disasters are also rising, especially in coastal cities affected by sea level rise. The built environment is an important mediating factor for urban health risks—for example, green space can reduce the heat island effects and mitigate pollution; passive and active cooling of buildings may reduce the health effects of heat extremes, while also positively impacting mental health and wellbeing; appropriate infrastructure and zoning can lessen disaster vulnerability

To effectively address complex urban and planetary health issues at the intersection of society and environment, we must drastically increase the level of engagement and collaboration across disciplines and sectors, and take advantage of more effective modes of analysis.

Health is often conceptualised as set of outcomes, isolated in whole or in part from other societal and development priorities. As such, it is often treated

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separately in policy, planning, and practice. Yet, health is neither singular nor separate—rather, it is a web, inclusive of and interweaved with environmental, social, and economic factors. A failure in health is a manifestation of failures at many different points in the web, implying a need for multiple corrective or preventive actions by a multitude of actors—such an approach of marginal fixes can lead to uncontrolled developments, unwanted outcomes, and high costs.

Alternatively, a systems approach to urban health aims at managing complexity. It perceives a city as a complex system with direct and indirect cause-effect chains, best understood as positive and negative feedback loops, which are important drivers of system behaviour and potentially important levers of change [8]. Understanding the dynamic complexity of urban systems can improve the quality of decision making by illuminating the interconnectedness of system variables and showing options for interventions [9].

In a meeting in Xiamen, China, the International Council for Science's global, transdisciplinary science programme on Systems Science for Urban Health and Wellbeing (UHWB), in collaboration with Future Earth's Health Knowledge-Action Network (FE Health KAN), highlighted the need for innovative new approaches to making urban environments healthier and motivating the critical leap from knowledge to action

Health experts, researchers, city planners and decision-makers agreed on the *Xiamen Call for Action*. This call transcends the demand for knowledge generation, highlighting the need for integrated knowledge to be fostered, positioned where it is most needed, and directed to societal applications. This call is the culmination and brings together several intellectual pieces over the course of several years' work in the urban health space by a range of different actors— representing the latest state-of-the-art on what is needed for urban health and societal engagement.

The FE Health KAN has worked to synthesise and prioritise critical research areas identified through scoping meetings, consultative discussions, and an online global survey. These research priorities intend to illuminate the complex underpinnings of the fabric of urban systems that shape the way urbanisation impacts humanity and vice versa.

The Call for Action recognises that the urban and planetary health issues that affect people in cities around the world are systemically interconnected and complex,

accelerating, and leading to adverse health outcomes, in particular affecting vulnerable groups.

The type of knowledge needed to solve those challenges and problems requires that researchers integrate, and transcend disciplinary domains. Policymakers at all levels must also be encouraged, incentivized, and empowered to engage and foster an understanding of the nature of health in changing urban environments.

The first step, before integrated coordination can work, requires a common language to improve communication and engagement across stakeholder groups. Among the actions needed are substantial investments in science communication, mediation of cross-sectoral and interdisciplinary communication among varied stakeholders, and the creation of opportunities for the latter to engage in decision-making processes. Examples already exist at many different levels—the ICSU Regional Office of Latin America and the Caribbean, to take one, has piloted a High-Level Inter-Ministerial Urban Health Task Force "Modelo de Salud Urbana" which brings together stakeholders from different ministries and agencies at a national level in El Salvador.

The perspective set forth here implies a set of principles required to improve health outcomes.

No matter the locale, these principles are critical for fostering the change needed to address urban health issues.

Principles of building systems governance for urban health:

1. Clear leadership and mandate to deal with urban health issues in an integrated manner.
2. Inclusiveness: including human rights; mutually beneficial for sectors.
3. Inter-sectoriality: various urban sectors, such as transportation, energy, housing, including primary health care, work, and achieve urban health outcomes together.
4. Health and wellbeing as performance indicators which need to be measured centrally and locally.
5. Risk sharing: stakeholders investing in and benefiting from cross-sectorial collaboration also share the costs
6. Pre-cautionary principle: it's about both the curative and preventive dimensions of health.

Such principles cut across domains, expertise, sectors, and actors—and must be implemented as such

through participation and the understanding of complexity.

A high-level integrated systems governance strategy for cities is needed.

That strategy defines urban environmental as well as social and mental health goals for all urban sectors and is part of a central coordinating urban intelligence unit (the "brain" of the city) which measures and monitors success towards the defined health goals. By integrating health in all policies, the "brain" of the city enables the management of a city towards sustainable development goals. National public health agencies often already assemble knowledge and expertise from various urban sectors and have the potential of implementing urban systems governance for health and wellbeing.

A roadmap, one that successfully articulates the interactions and collaborations of each community of actors, that defines their rights and obligations, provides incentives for working together and one that plots a path forward in bringing health issues to the top of policy agendas, is what is needed. This call to action by the international science community for a systems science to urban health and wellbeing aims to encourage steps in that direction. This builds on previous statements and declarations, most notably the International Society for Urban Health 2009 statement [10] and the World Health Organisation's Shanghai Declaration on Healthy Cities [11].

This call for action places the research community, working across disciplines and expertise, in direct collaboration with other stakeholders. This is the collaborative outcome of the members and advisors of the scientific committee, co-sponsors of the ICSU programme, as well as the members of the Future Earth Health Knowledge-Action Network. It seeks to create a centre of gravity for the urban health community. More importantly, it proposes a language to dialogue with other stakeholder groups implicated in the urban health question, one that builds champions and allies in other sectors.

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