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Diez Roux makes a compelling case for the value of systems approaches in understanding and responding to contemporary urban health challenges. Although there is a long tradition of systems modeling in infectious disease, we are still in the early days of the application of such approaches to urban health, and indeed to population health more generally. The author argues cogently that the characteristic capacity of systems approaches to account for positive and negative feedback is critical in this context. Systems analytical methods, moreover, are entirely consistent with inter-sectoral approaches, which are already widely accepted as fundamental for effective public health research and action.

Without a systems approach, encompassing both analytical methods and the co-production of knowledge among academics and with lay professionals and communities, researchers and policymakers may struggle to move beyond a siloed approach to the challenges of health and development. An instructive case is transportation by electric automobiles in cities. Around the world, environmentalists are currently advocating for transition of the global motor fleet to electric fuel as a strategy to reduce greenhouse gas emissions and mitigate climate change. However, a switch from fossil-fuel powered cars to electric cars would do nothing to increase active transportation and reduce the sedentary habits that – together with poor nutritional habits – are driving global epidemics of obesity and related non-communicable diseases. It would also fail to change the allocation of space in cities by reducing the amount of land for roads and parking for personal vehicles (which sit unused much of the time) or improving housing location in relation to other resources. It would fail to reduce congestion or stress associated with driving, or free up land for public green space, which has proven health and environmental benefits [1]. In most cases public mass transit and improve conditions for walking and cycling are the best options for healthy and sustainable urban transportation.

The global urban transition is arguably the most profound change in human ecology in the history of human life on Earth [2]. In this context, systems approaches are helpful for framing eco-social understandings of health. The UN system is currently negotiating a new global sustainable development framework for the period 2016-2030. For the first time, this so-called Post-2015 Development Agenda will integrate the current development focus on poverty eradication with sustainable development. This new development framework will require new ways of working, including integrative and interdisciplinary approaches to building new knowledge. While systems approaches are not the only way to deliver this, they are one way to do so.

Indeed, it has been argued that there is a pressing need for a new public health paradigm that brings ecological determinants of health more sharply into focus, alongside the social determinants of health. Called "planetary health" [3], this new paradigm will require public health workers to embrace human ecological understandings, including of the human place in nature and broad relationships between human health and the health of ecosystems, in which the physical structures of cities are understood as artefacts of human activity. All human activities (shaped in turn by the built environments we create) have potential for positive and negative impacts on human health and the health of planetary systems (e.g. the climate system, biodiversity). Systems approaches provide an effective way of understanding the dynamic interplay between the health of people, places, and planetary systems – a human ecological understanding [4].

In the classic book *Thinking in Systems: A Primer*, Meadows [5] highlights system traps and opportunities including policy resistance, in which various actors trying to pull a system state toward different goals simply pull the system farther from the goals of other actors and produce additional resistance. In the public health context, this understanding is relevant to the seemingly inexorable increase in obesity rates around the world (despite considerable efforts at prevention and control) and in many other intractable health challenges. A key challenge for effective public health action in cities is to carefully evaluate interventions for potential unintended harmful consequences (e.g., the history of failed grand urban housing schemes to address socioeconomic disadvantage).

Last December, the new International Council for Science (ICSU) 10-year global interdisciplinary urban health program [6], co-sponsored by the United Nations University and the Inter-Academy Medical Panel, was launched with an expert workshop at the Institute of Urban Environment of the Chinese Academy of Sciences in Xiamen. The program aims to convene scientists and their counterparts in government, industry, and communities to tackle critical urban policy and planning questions. The new program will strive for co-production of knowledge to improve decision-making – an approach that acknowledges the expertise of those who make decisions on a daily basis, seeking new insights through

effective applied research. Here again, systems approaches are indispensable. For example, one such approach – collaborative conceptual modelling (CCM) [7] – provides a structured method for transdisciplinary dialogue, an essential precursor for co-production of knowledge. CCM is a systematic way to bridge differences in language and ways of understanding across sectors, and to bring lay and local knowledge together with understandings from the natural and social sciences and the humanities.

In short, there is no doubt that classical empirical approaches in epidemiology will always remain essential tools for urban health. However, as we confront an array of new urban problems in health – and, no less, in the sustainability of human civilizations – there is a need to embrace both fresh methodological approaches and a broad engagement among unlikely partners, both in science and in the wider world. It remains to be seen whether the promise of systems approaches in urban health will be fulfilled. There is also no doubt that new research funding and further capacity-building will be prerequisites for success.

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