Chapter 14
The Case for Comprehensive, Integrated, and Standardized Measures of Health in Cities

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After decades of unprecedented migration into urban areas, the iconic demographic development of the twenty-first century is indigenous growth of cities.[1] The world's urban population is projected to reach 4.2 billion by 2020, and the urban slum population is expected to increase to 1.4 billion by 2020. While 10 % of the world's population lived in cities in 1900, 53 % of the world's population now resides in an urban area, and by 2050 this number is expected to exceed 75 %. As a planet, we are about midway through this transition. The world is said to have crossed the so-called rural–urban divide in 2007.

[1] This demographic transition was noted very early in its history by Lewis Mumford (1956) in his seminal work "The Natural History of Urbanization," **in** *Man's Role in Changing the Face of the Earth* (Edited by William L. Thomas). Many documents from the international development agencies have tracked this transition with one of the more important ones being produced by the UN in 2001 and titled *Cities in a Globalizing World*: *Global Report on Human Settlements* (UNCHS 2001).

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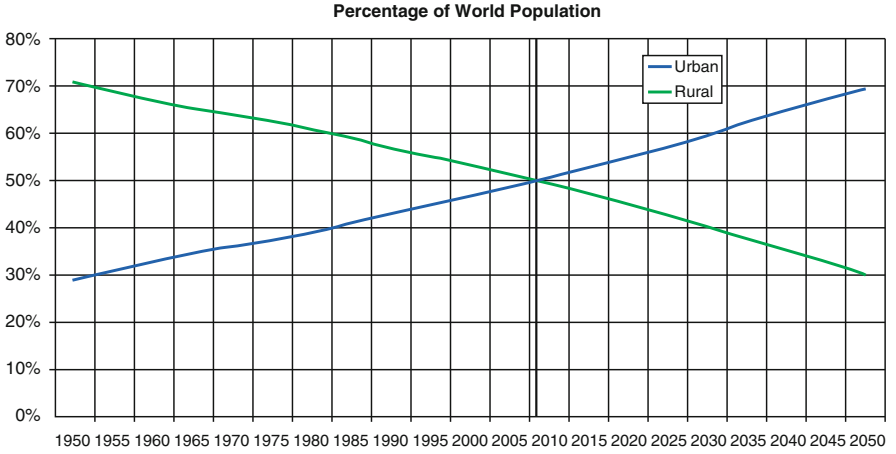

Source: UN Department of Economic and Social Affairs (2007): *World Urbanization Prospects*: *The 2007 Revision Population Database*

Most of this demographic shift is occurring in low- and middle-income countries (LMICs). Nations such as Canada are already through much of the transition. In the mid-1870s, Canada was 20 % urban and 80 % rural, whereas by 2005, this balance had reversed to 80 % urban and 20 % rural. Other relatively HICs have moved through similar transitions, including Brazil (now 86 % urban), the United States (82 %), Australia (89 %), United Kingdom (90 %), and Jordan (78 %). In global terms, it is the LMIC nations that are emerging as pivotal actors in this demographic transition. Virtually all of the world's future urban population growth is predicted to occur in less-developed countries. Cities of the developing world will absorb 95 % of population growth and will be home to 80 % of the world's urban population.

This global transition is also marked by a growing number of exceptionally large cities. In a UN ranking of city agglomeration by population, it was found that by 2005, the number of megacities (defined by the UN as greater than ten million) had increased to 20, and it is projected that there will be 22 megacities in 2015. With 35 million residents in 2005, the metropolitan area of Tokyo was by far the most populous urban agglomeration in the world. Tokyo was followed by Mexico City and New York-Newark, each with 19 million residents, and São Paulo, with 18 million people. In 2005, megacities accounted for about 9.3 % of the world's urban population [1]. By 2015, 17 of these 22 megacities will be in the LMICs [1].

Thus, one out of every three people living in cities in 2020 will live in impoverished, overcrowded, and insecure living conditions (UN-Habitat 2007). Global health risks, policy challenges in health services, and other health issues find particular expression in the world's cities as they grow. The relationships between health and other city conditions are increasingly complex and entangled—social cohesion, safety, security, and stability are being challenged by social exclusion, inequities, and shortfalls in basic services. Health is one manifestation of a city's complex conditions in each of these areas.

City leaders around the world have expressed intensified interest in the mechanisms available for supporting and promoting the health of both new and established residents.

This stems in part from the recognition that, in many ways, the path toward healthier cities is entwined with more effective governance and innovation in local urban policy. As the globe's population has congregated in major urban centers, the nature of healthcare needs for urban populations has also changed. The health of a city's residents depends on critical infrastructure, the maintenance of water and sanitation systems, the availability of affordable housing, the protection of spaces for physical activity, the extent of pollution, and the strength of the economy, among many other conditions. Thus, the governance of a city has a profound impact on the health of its inhabitants. Understanding this link requires a broader scope of inquiry and a more nuanced understanding of what factors are worthy of attention in the urbanized and urbanizing setting. In other words, improving the health in any city must account for the complexity of layered conditions in the city, including its governance profile.

At the same time as cities are growing, healthcare industries are globalizing. A crisis of cost is occurring in many regions of the world [2]. Innovations carry the potential to sustain and improve quality of life and quality of health, but they must also be affordable both as investments and in operation. As a result, particular attention has focused on the opportunities for frugal or low-cost innovation in cities in which per capita income is lower than the global average. Healthcare innovation represents the convergence of both municipal and health policy. The challenge is in simultaneously innovating to improve the health of the poor while assuring that such innovation is locally relevant, given the complex fabric of issues unique to each city [3].

Meeting both the localized needs of a city's urban population and tapping the potential of global health innovations requires a comprehensive understanding of the complex condition of a city, as well as its prospects for improving health. In this paper, we argue that standardized city indicators, developed in partnership with city leaders to establish a common, accepted methodology for measuring health and other urban conditions, can unlock an understanding of each city's unique and shared health challenges and thus enable cross-city learning. This understanding is a prerequisite for effective action to improve the health of urban populations.

Nothing about the development or interpretation of standardized indicators is or should be simple. Such metrics must be developed collaboratively—through consultation with city leaders—to achieve legitimacy and relevance. The complexity of a city's conditions defies a ranking-based interpretation of such standards. Instead, comparisons must be accompanied by a detailed and qualitative interpretation of the relative circumstances of cities. The task of developing standard metrics must therefore be undertaken with sensitivity and commitment.

At the same time, the need for such measures is significant. The growth of major urban settings has many implications for the health of their inhabitants. Our ability to understand these effects has been hindered by a lack of comprehensive metrics for meaningfully measuring health in cities. While some data on health are available, we know little about the strategies and dynamics of improvements in health in settings where migration has been significant and/or where indigenous growth has occurred. We know even less about returns on major civic investments in health.

Thus, in spite of the obvious relevance of health metrics, the relationship between urbanization and health has remained under-discussed and under-studied.

With a view to addressing this gap, this paper will seek to make the case for integrated assessments of the relationship between health and urbanization. In making this case, we will briefly review the connections between various facets of city conditions and health. The core of our argument is that the evolution of cities has introduced new layers in our interpretation of urban health, new complexities in governing cities with respect to health services, and new research challenges to measure and monitor health in cities. How do we address this multiple layering and new complexity? How do we account for the unique health circumstances of each city while exporting best practices and fostering mutual learning across city boundaries? We argue that we can only obtain answers to these questions through a much broader and more comprehensive framework for assessing health than is available today, and we highlight a leading initiative based at the University of Toronto—namely, the Global City Indicators Facility (GCIF).

Facets of a Comparative Measurement Framework for Cities and Health

Historically, measures of the health of populations have fallen into two broad categories. The first category involves involves hard measures of medical capacity. This refers to quantitative assessments of factors such as the number of doctors per capita, the number of hospital beds, and gross expenditures on health services. The second category involves cross-sectional measures of population health with respect to specific outcomes such as infant mortality rates, life expectancy at birth, and maternal mortality. In this sense, all measures of health have been tied directly to traditional health sector indicators.

Recent emphasis on public policy and the social determinants of health has led to greater emphasis on project-specific assessments, in particular "evidence-based" analysis of the incremental impact of particular interventions on population health. Yet despite impressive efforts to improve understanding of the impact of particular programs, the applicability of these analyses has been limited primarily because the context for each intervention differs. In addition, the metrics relevant to a particular program reflect its idiosyncratic goals and thus differ by project, making comparability across studies difficult to achieve.

While these approaches are certainly not without merit, we recognize that there are a number of opportunities to develop comparative metrics that can inform the implementation of programs and policies. Without comparability, city leaders cannot assess the performance of their municipality's programs. However, developing "comparable" metrics must allow for the complexities associated with health factors, such as the levels of inequality and poverty within a city, the degree of participatory local governance, and the impacts of environmental, economic, and social conditions. As a result, we propose quantitative comparative analysis—both in cross section

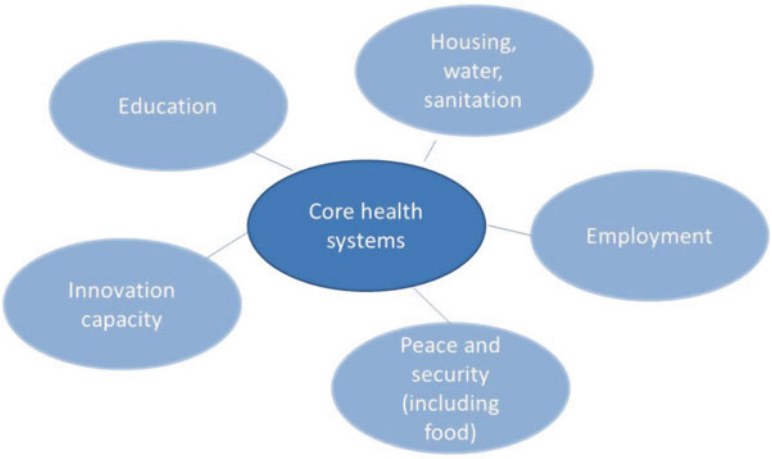

Exhibit 14.1 Facets of city life

and longitudinally—interpreted through integration with qualitative assessments of the complexities of each city's conditions with a view to exposing a more holistic picture of the status of health in cities (Exhibit 14.1).

This kind of comprehensive system of comparative, system-based assessments must include of the following facets of city life that have been documented as relevant to public health.

Education

Education is among the most important determinants of health in a city's landscape [4]. The correlation is sufficiently strong as to support the view that education—and especially the primary education of girls—is one of the most effective forms of preventative medicine [5]. Literacy, quantitative skills, and the ability to communicate effectively provide a city's youth with the capacity to envision alternatives related to personal health, such as avoidance of violence, the pursuit of nutrition, and a basic capability to self-diagnose illnesses such as malaria. Education is critical to one's ability to obtain meaningful employment and is essential for building a population with the ability to problem solve, think critically, and behave resourcefully.

As literacy and education are so closely tied to socioeconomic status, increased education reduces poverty and thus allows communities to overcome economic barriers to access to health [6]. By cultivating an understanding of the consequences of behavioral choices and of alternatives, education can dramatically reduce the spread of communicable diseases such as malaria and sexually transmitted diseases such as HIV/AIDS. It has the effect of improving maternal health, child health, and

newborn survival. A comprehensive examination of the health of cities must therefore account for such factors as levels of primary-school enrollment, the rates of male and female attendance, and primary and secondary school completion rates.

Housing, Clean Water, and Sanitation

Safe and affordable housing is an integral component of urban health. Chronic homelessness is often a direct burden on a city's healthcare system.[2] The absence of safe and affordable housing engenders desperation and can lead to vulnerability to violence, poor nutrition, mental health issues, and exposure to infectious disease [7]. Poor housing is also frequently accompanied by practices such as in-home, open-pit cooking and inadequate separation of water and sanitation facilities, which expose city dwellers to carcinogens and perniciously drug-resistant waterborne diseases [8]. In short, access to housing is significant both to the physical and mental health of a population. Variability in the quality of available housing may exacerbate the health impacts of inadequate housing. For example, increases in the value of housing may be accompanied with reduced options for shelter. Poorly maintained, low-income housing may be only marginally healthy due to problematic air quality, pervasive mold, disease-amenable dampness, and inadequate emergency equipment.

Employment

The rate of employment is among the most significant determinants of health within a population. Of course, an immediate impact of employment is normally income, which confers direct benefits on workers who almost invariably use income to improve nutrition, personal security, and housing. Employment also confers other benefits on workers, such as social support, the prospects of long-term security, and mobility [9]. While sound and secure employment can have immediate and long-term benefits to a person's health, in environments where employment is less safe or secure, the adverse impact on one's health can be significant [10]. Unemployment or underemployment may harm one's health by prohibiting access to necessary care or by undermining nutrition or housing. Dangerous and stressful jobs and workplaces with minimal safety and security measures may also materially reduce a worker's prospect of health.

[2] Consider, for example, the Vancouver Coastal Health organization's adoption of a "housing first" strategy to address health issues in the city's notoriously impoverished downtown east side. The belief that housing is not only significant in providing immediate physical wellbeing but also dramatically reduces the prevalence of many health issues drove the innovative policy. The goal was to reduce the rates of homelessness in the area and simultaneously reduce the burden of preventable illnesses on the local healthcare facilities.

Peace and Security

Beyond the simple threats of physical danger and violence that are posed by the presence of conflict and civil unrest, the absence of peace and security impacts health in many other ways [11]. One of the most immediate is food insecurity [12]. When cities are engaged in or subjected to conflict, the regular importation of foodstuffs is almost always disrupted and may even be halted. Health conditions suffer accordingly and may become acute in regions already at risk due to malnutrition. Similarly, conflict may disrupt access to health facilities—for example, when civilians cannot leave their home for travel to hospitals or clinics due to the risk of injury en route. In contexts where movement is limited due to conflict, access to medicine, clean water, and heating fuel may also be limited. Lack of access to antibiotics or painkillers can trivialize the entire operational capacity of a medical team, as we have seen in many humanitarian crises (and recently in Homs, Syria) [13].

In cities where conflict or destabilization progresses, the likelihood of "medical flight" increases. Medical flight occurs when medical professionals or medical NGOs withdraw from a city, either voluntarily or on command, out of concern for safety. In 1995, humanitarian medical organizations left the city of Goma in the Democratic Republic of Congo (then Zaire), due in part to a belief that their medical contributions were having the effect of perpetuating conflict by enabling the health of the perpetrators of crimes [14]. The decision to depart was, however, adverse for thousands of Goma residents who no longer had access to any medical facilities [14].

Innovation Capacity

The presence of industry and the ability to develop a local economy or participate in regional or global markets are not only beneficial for employment but also increase a particular city's capacity to innovate and therefore achieve comparative advantage [15]. Over time, the ability of a city to flourish depends in a detailed way on the micro-dynamics of exchange among residents and the unique character of the city that emerges. Innovative cities and the ideas they spawn stimulate exchange that heightens a city's value added in the broader region and around the world, which ultimately makes the city economically sustainable.

Where there is capacity to innovate, there is greater achievement of context-specific solutions to health issues. The high-cost health solutions used in developed nations may not be sustainable or similarly effective in less-developed contexts [15, p. 17]. Low-cost innovations that have the ability to permeate health systems and practices in developing countries will have a far greater impact than externally imposed short-term, high-cost solutions [15, p. 25]. However, where there is no capacity or support for this type of innovation within a city, the potential benefits to population health are lost—which can have dire consequences in

nations that already face health burdens from many of the aforementioned determinants of health. For example, this would certainly be true of Haiti, Somaliland, and South Sudan.

Designing a Comparative Measurement Framework for Cities and Health

Comparative health measures for cities and a broadened basis for a more informed contextual analysis for health in cities requires a platform of city data that is comparative and globally standardized across cities. The processes by which such a set of metrics is developed are crucial to their legitimacy and usefulness. Similarly, a careful interpretation of the metrics that integrates qualitative assessments and reflects the unique conditions of each city's context is central to carrying out an apolitical assessment.

The Global City Indicators Facility (GCIF) has been established to respond to the urgent need for a globally standardized set of city indicators. Headquartered at the University of Toronto, the GCIF hosts a network of some 250 cities worldwide and provides a globally standardized system for data collection that allows for comparative knowledge and learning across cities globally (see Exhibit 14.2).

The GCIF is currently developing a Global City Indicators Standard within the framework of the International Organization for Standardization (ISO) to ensure a

Exhibit 14.2 The Global Cities Indicator Facility

consistent and standardized methodology for city indicators. This work is being undertaken with the Technical Committee on Sustainable Development in Communities (TC268) to develop a new series of standards for a holistic and integrated approach to sustainable development.

The development of the indicators has only begun. No comprehensive assessments are yet publicly available, but the discourse surrounding the construction of the database has already yielded a number of important insights regarding the design of a comparative measurement framework. The prospective power of these indicators, in this age of urbanization, is in the hands of city managers, politicians, health planners, researchers, business leaders, designers, and other professionals who seek to promote livable, tolerant, healthy, sustainable, economically attractive, and prosperous cities globally.

One critical facet of the GCIF's work is the necessity of partnerships in the interpretation of the data generated through an assessment of any city's profile. The GCIF assists cities in drawing comparative lessons from other cities locally and globally. The GCIF online platform enables cities to compare and learn from other cities relative to their peer groups. Cities can sort themselves into relevant peer groups, for example, according to their *population size* or *region* in order to draw comparative lessons. Cities can also sort themselves into other comparative peer groups such as climate type, land area, GDP per capita, or gross operating budget. This comparative approach creates a knowledge network that connects cities and builds global partnerships.

As these collaborations develop, city leaders such as mayors and city managers increasingly ask for comparative analysis: How are we doing relative to our peers? How can we learn from our peers in order to better plan for the future?

The Challenge of Knowing Where to Draw the Line

The GCIF indicators are structured around 20 themes and measure a range of city services and quality of life factors which can support and provide a framework for health planning in cities. The current set of global city indicators was selected based on a pilot phase with nine cities and from significant input from the current member cities, ensuring that these indicators reflect city information needs, interests, and data availability. A subset of these indicators related to health is included as Exhibit 14.3 in the GCIF Profile titled *Health in the City*.

This profile includes a platform of health indicators for cities according to themes: Governance; Economy; Demographics; Demand for City Services; Environmental Stressors; Healthy Living Space; Potential Health Hazards; Access to Information, Education, and EMS; and Level of Healthcare Service.

A central challenge in the development of this list of indicators is in "drawing the line," i.e., identifying which facets of city conditions will *not* be considered an element of health. City leaders involved in the project naturally favored measures that reflected the unique conditions of their urban environments. Several GCIF

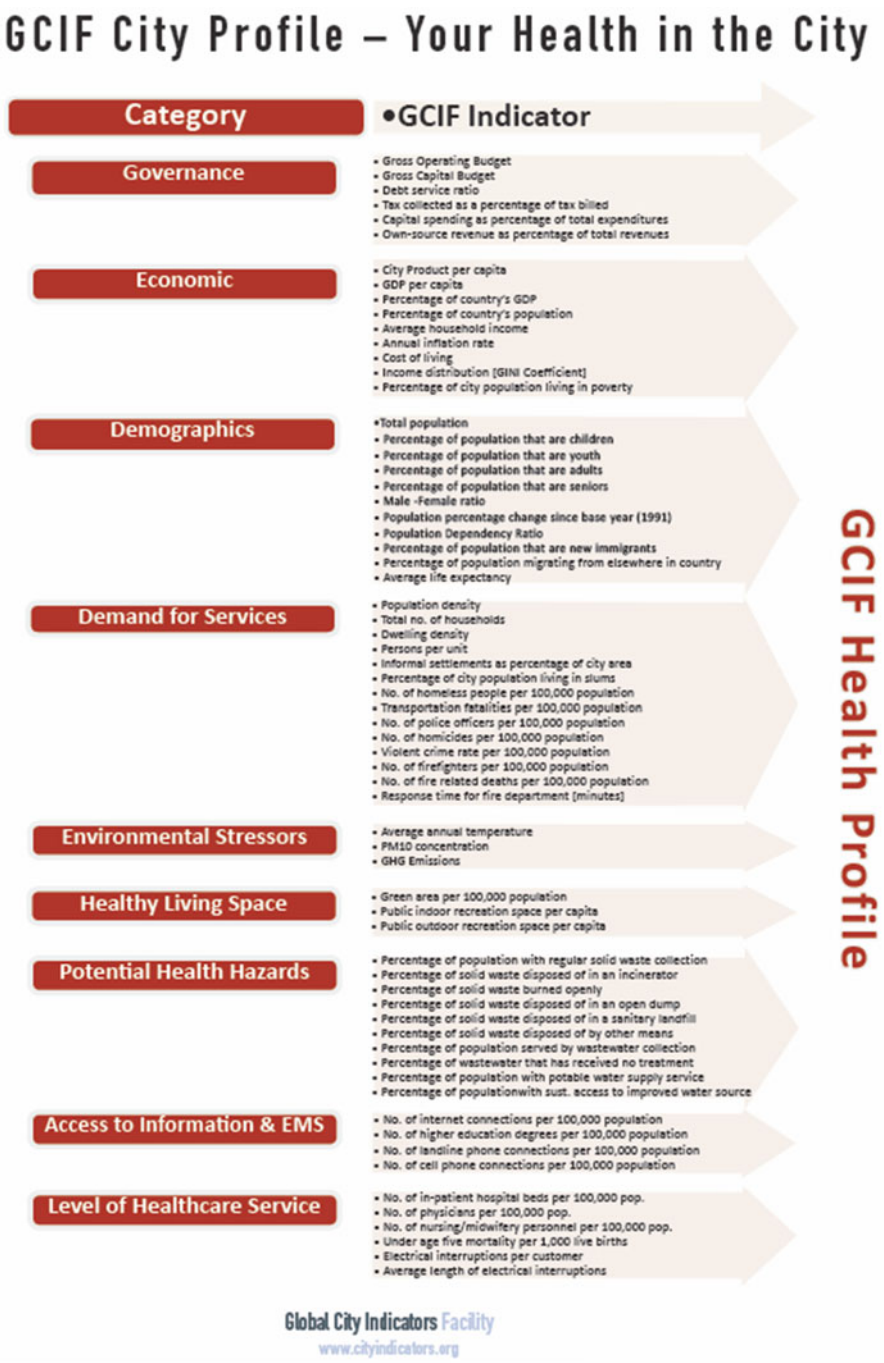

Exhibit 14.3 GCIF health profile

conferences were held to negotiate metrics among members of the facility to achieve a balance that allowed both comparability and captured systematically-relevant nuances of cities under varying circumstances. For example, after considerable discussion and reflection, conference participants elected to include measures of the stability of electricity as a critical component of the health system—primarily because frequent and long outages have a direct impact on health needs.

The Challenge of Accurately Measuring Change

Effective measurement requires not only cross-sectional validity but also inter-temporal series that support an understanding of how the circumstances of a city develop over time. The measurement of change in critical variables is central to the identification of a particular policy with a particular outcome.

Measuring health indicators accurately in these settings is complicated by many factors, including the absence of consistent systems of citizen registration, mortality, clinical outcomes, police action, school enrolments, and the quality of water, to name only a few. As the quality of measurement systems improves, accuracy depends not only on capturing contemporaneous metrics on each relevant dimension but also on tracking progress in the measurement itself. Such tracking is essential to the avoidance of attribution bias in improvements. In other words, an observed improvement in childhood education, may be partly due to actual improvement in school systems and partly due to better mechanisms of assessment. Understanding the difference is central to understanding the payoff to investments in health improvements. The challenge of effective implementation of systems for tracking improvement requires, in impoverished settings where the demand for resources is high, the diversion of crucial capabilities to tracking metric quality.

The Challenge of Comprehensiveness

The demographic transition occurring globally in cities is also marked by shifting age cohorts and, more generally, marked by aging populations in major geographic regions. Significant advancements in human development and public health have resulted in higher living standards and a global population that lives longer [16]. Statistics indicate that the global life expectancy rate has risen from 47 years in the 1950s to 65 years at the turn of the new millennium [17]. In Japan, a highly developed country, the average life expectancy is over 80 years, and by 2050, it is expected that those under the age of 20 will be outnumbered by those over the age of 80 [17]. Although these factors suggest major gains in human capabilities and knowledge, they also bring about a new set of challenges. Global population growth coupled with increased life expectancy rates indicate that aging is emerging as a pressing policy and development issue [18]. The number of senior citizens (aged 60 and over)

will grow from 11 % in 2006 to 22 % by 2050 [1]. For the first time in human history, seniors will outnumber children aged 0–14 years [1].

This demographic shift brings with it a new set of policy challenges, particularly at the city level, and a new demand for metrics that account for these changes. This is especially true for LMICs, which must deal with the effects of an aging population in addition to the burdens of poverty. According to UN-Habitat, "in developing countries the share of older people in urban communities will multiply 16 times from about 56 million in 1998 to over 908 million in 2050. By that time, older people will comprise one fourth of the total urban population in less developed countries" [19]. In Africa, aging is not visible in most policy dialogue and so tends to be de-prioritized in terms of budgetary allocations, thereby increasing the vulnerability and marginalization of older Africans [20]. These predictions indicate that policy decisions at the city level are becoming increasingly vital to the state of the world's aging population. Evidence-based decision-making facilitated by indicators will prove invaluable in maneuvering through this demographic transition.

Early Insights

The issues raised in the implementation of a system of comprehensive, integrated, and standardized measures of health in cities reflect a larger and more fundamental question regarding urbanization. The rapid growth of cities and the transformation of nations to urban predominance raise a core set of challenges in the governance of cities. Governing frameworks and constitutions, created under historic circumstances of largely rural societies, are increasingly contested with the rise of cities. Key questions arise in cities worldwide and in almost all nations: What are the relative roles of national and local governments in managing cities? In particular, how should responsibilities and fiscal powers be distributed between different tiers of government, as an increasing proportion of a country's population is concentrated in cities? In terms of health, what multilevel governance model is preferred, and how does one determine answers to this governance arrangement locally?

The devolution of powers to the municipal level is often argued as a means by which to achieve good urban governance. Granting municipal governments control over revenues and expenditures, raised and spent locally for local benefit, aids in the improvement of a city's "livability" through improved performance and effective delivery of city services.

Empowering municipal governance is made more complex, however, by the growth of the urban population, its geographic spread across existing municipal boundaries, and its diversity. The actual economically functional areas of cities and their competitive geographic concentrations have rendered existing municipal boundaries and structures of governance outdated and ill equipped to confront the challenges of cities in the twenty-first century. In the UN-Habitat's *State of the World's Cities Report 2008/2009*, McCarney and Stren argue that governance across vast and multiple jurisdictional boundaries is plagued with fragmentation in

policy, decision-making, management, and implementation. Poorly understood and poorly governed cities can neither deliver services nor support sustainability, poverty alleviation, and prosperity agendas. A growing challenge will be how to determine appropriate governance structures for managing urban areas and the inter-jurisdictional issues that megacities engender [21]. New systems of urban governance are required for inclusive and healthy cities that can deliver on the economic, social, and environmental promise of urbanization.

The effectiveness of governance is the determining factor in whether a population will be passive recipients of health interventions or active participants in a healthy city. Effective health governance in the face of rapid urbanization can only be achieved when decisions are supported by accurate, timely, and relevant information about both health conditions and the effectiveness of health interventions. The decentralization of the administration of effective health policy depends crucially on the development of a skilled workforce steeped in an understanding of the complexities of achieving desired health outcomes, plus a workforce equally skilled in the administration of health protocols. Effective health interventions should and must be targeted at elements of city conditions that are most relevant to the city's health profile: education, housing, water, sanitation, peace and security, and innovation systems. Targeting efforts at specific root causes while tailoring them to the constraints of a city's capacity is only manageable when information is readily available about a city's performance. Where the operations of governance have access to increased information, more informed decision-making becomes possible. This will require more extensive research and analysis of the indicators discussed above and the contextualization of this information within the governance of a given city.

Even as the GCIF develops, data limitations at the city level and the difficulties of translation of metrics into city management and informed policy point to critical challenges for the future. Already we envision the need for a deeper examination of the factors that shape health and the extent to which they can be measured comprehensively. There is reason to believe that education, empowerment, and innovation are mutually complementary and can best be understood not separately but in an integrated model of city dynamics. The GCIF contributes to the improved health of cities by sparking interactions among city leaders on the precise elements of such a model.

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References

1. UN. Population ageing. New York: Department of Economic and Social Affairs, Population Division. United Nations; 2006.
2. Dillon K, Prokesch S. Global challenges in health care: is rationing in our future? HBR Blog Network. http://blogs.hbr.org/cs/2010/04/global_challenges_in_health_ca.html (April 5, 2010). Accessed 9 May 2013.

3. Widdus R, White K. Combating diseases associated with poverty: financing strategies for product development and the potential role of public-private partnerships. August 2004. http://www.globalforumhealth.org/filesupld/ippph/CombatingDiseases.pdf
4. Feinstein L. Quantitative estimates of the social benefits of learning, 2: Health (depression and obesity). London: Centre for Research on the Wider Benefits of Learning; 2002. http://www.learningbenefits.net/Publications/ResReps/ResRep6.pdf#search=%22quantitative%20estimates%20of%20the%20social%20benefits%20of%20learning%22
5. Benoit C, Shumka L. Gendering the health determinants framework: why girls' and women's health matters. Vancouver: Women's Health Research Network; 2009. p. 9–11.
6. Marmot M. Social determinants of health inequalities. Lancet. 2005;365(9464):1099–104.
7. Centre for Research on Inner City Health. Housing vulnerability and health: Canada's hidden emergency. Toronto: St. Michael's Hospital; 2010. p. 1–3.
8. WHO. Health Impact Assessment. Housing and health. 2010. http://www.who.int/hia/housing/en/. Accessed 9 May 2013.
9. Public Health Agency of Canada. What makes Canadians healthy or unhealthy?—population health approach. Government of Canada. 2013. http://www.phac-aspc.gc.ca/ph-sp/determinants/determinants-eng.php#employment Accessed 9 May 2013.
10. WHO. Health impact assessment. The determinants of health. http://www.who.int/hia/evidence/doh/en/index.html. Accessed 9 May 2013.
11. WHO. The Ottawa Charter for Health Promotion, Ottawa. 1986. http://www.who.int/healthpromotion/conferences/previous/ottawa/en/index.html. Accessed 9 May 2013.
12. WHO. Health Impact Assessment. The Determinants of Health; Food and Agriculture. http://www.who.int/hia/evidence/doh/en/index3.html. Accessed 9 May 2013.
13. Doctors Without Borders. How we work. http://www.doctorswithoutborders.org/aboutus/activities.cfm. Accessed 9 May 2013.
14. Orbinski J. An imperfect offering; humanitarian action in the twenty-first century. Toronto: Anchor Canada; 2008. p. 262–3.
15. Council on Health Research for Development. Beyond aid: research and innovation as key drivers for health, equity and development, Forum 2012, South Africa. 2012. p. 6–7.
16. Brasilia Declaration on Ageing. World Health Organization. 1997, No. 4:21.
17. Leithäuser G. A city for all generations—focusing on ageing population. World Urban Forum IV—Dialogue 6. Nanjing, China. 2008.
18. UN. United Nations Madrid international plan for action on ageing. New York: Department of Economic & Social Affairs, Division for Social Policy and Development. United Nations; 2002.
19. UN-Habitat. Living conditions of low-income older people in human settlements. A global survey connection with the International Year of Older People 1999. Nairobi: UN-Habitat; 1999.
20. Nadalamba A, Chikoko M. Aging population challenges in Africa. AFDB Chief Economist Complex. 2011;1(1). www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Aging%20Population%20Challenges%20in%20Africa-disribution.pdf
21. McCarney P, Stren R. Metropolitan governance: Governing in a city of cities in UN-HABITAT, *state of the world's cities 2008/200*. London: Earthscan; 2008.