Healthy Cities

Revisiting the Role of Cities in Promoting Health

Hyunji Lee, José Siri, Jonathan Hasoloan, Terri B. Chapman, and Maitreyi Bordia Das
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# Contents

Abbreviations and Acronyms  
Acknowledgements  

**Overview**  

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction</td>
<td>9</td>
</tr>
<tr>
<td>1.1. Setting the Stage: The Evolution of Healthy Cities</td>
<td>10</td>
</tr>
<tr>
<td>1.2. Taking Healthy Cities Forward</td>
<td>14</td>
</tr>
<tr>
<td>1.3. Roadmap of the Report</td>
<td>20</td>
</tr>
<tr>
<td>Endnotes</td>
<td>21</td>
</tr>
<tr>
<td>2. The Next Decade: Defining Issues for Healthy Cities</td>
<td>15</td>
</tr>
<tr>
<td>2.1. The Growing Demand for Health Equity</td>
<td>23</td>
</tr>
<tr>
<td>2.2. Urban Health and Climate Change</td>
<td>33</td>
</tr>
<tr>
<td>2.3. Moving Beyond COVID-19 toward a Healthier Future</td>
<td>39</td>
</tr>
<tr>
<td>Endnotes</td>
<td>45</td>
</tr>
<tr>
<td>3. Healthy Cities in Action: Maximizing Health Co-benefits of Sustainable, Inclusive, and Resilient Urban Investments</td>
<td>47</td>
</tr>
<tr>
<td>3.1. Healthy, Low-Carbon Urban Spaces</td>
<td>47</td>
</tr>
<tr>
<td>3.2. Improved Access to Water, Sanitation, and Waste Management</td>
<td>58</td>
</tr>
<tr>
<td>3.3. Sustainable Urban Food Systems</td>
<td>64</td>
</tr>
<tr>
<td>3.4. Equitable Health Service Provision in Cities</td>
<td>69</td>
</tr>
<tr>
<td>Endnotes</td>
<td>73</td>
</tr>
<tr>
<td>4. Enabling Environments for Healthy Cities: Institutional and Financing Arrangements</td>
<td>75</td>
</tr>
<tr>
<td>4.1. Coordinating Institutions for a Healthy City Agenda</td>
<td>75</td>
</tr>
<tr>
<td>4.2. Healthy City Strategies</td>
<td>82</td>
</tr>
<tr>
<td>4.3. Sustainable Financing for Healthy Cities</td>
<td>88</td>
</tr>
<tr>
<td>Endnotes</td>
<td>91</td>
</tr>
<tr>
<td>5. Conclusion</td>
<td>93</td>
</tr>
</tbody>
</table>

References  


Figures

E1.1. An Action-Oriented Framework for Healthy Cities 2
1.1. Selected Milestones in Urban Approaches to Health Challenges 10
1.2. An Action-Oriented Framework for Healthy Cities 15
2.1. Access to Electricity and Safe Drinking Water by Degree of Urbanization 24
2.2. Average Total Green Area (km²) per City 27
2.3. PM2.5 Concentration and Air Pollution Death Rates in Cities 31
2.4. Impact of Climate Change on Human Health 36
3.1. Different Types of Urban Assets for Nature-Based Solutions 53
3.2. Integrated Waste Management Facility in Singapore 62
B3.4.1. Vulnerable Markets in Upazila, Dhaka 66
B3.5.1. My Condition Kobe 72
4.1. Linkage of Institutions Relevant to Urban Health in Kigali, Rwanda 76
4.2. Evolution of Urban Health Focus in Kigali Planning Strategies 86
B4.2.1. Kobe City’s Healthy City Approach 87

Boxes

2.1. Health Impacts of Extreme Heat 37
2.2. Lessons Learned from Past Pandemics in the Republic of Korea 43
3.1. Improving Healthy Housing for the Urban Poor in Kigali 51
3.2. Utilizing Environmental Assets to Enhance Health and Well Being 54
3.3. Solid Waste Management in Azerbaijan 63
3.4. Vulnerability of Local Markets in Dhaka, Bangladesh 66
3.5. The ICT-Based Health Campaign “My Condition Kobe” 72
4.1. Governance Challenges and Opportunities in Air Pollution Management 78
4.2. Healthy City Strategy of Kobe City, Japan 87

Table

5.1. Summary of Healthy City Actions Related to the TIP Framework 96
# Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSPS</td>
<td>Self-Help Housing Stimulus (Indonesia)</td>
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<td>COP26</td>
<td>26th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change</td>
</tr>
<tr>
<td>DEWATS</td>
<td>Decentralized wastewater treatment system</td>
</tr>
<tr>
<td>EDGE</td>
<td>Excellence in Design for Greater Efficiencies</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<td>GDP</td>
<td>Gross domestic product</td>
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<td>GHG</td>
<td>Greenhouse gas</td>
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<tr>
<td>HIA</td>
<td>Health impact assessment</td>
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<tr>
<td>ICT</td>
<td>Information and communications technology</td>
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<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
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<tr>
<td>IWMF</td>
<td>Integrated Waste Management Facility (Singapore)</td>
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<td>NBS</td>
<td>Nature-based solution</td>
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<td>NCD</td>
<td>Noncommunicable disease</td>
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<tr>
<td>NGO</td>
<td>Nongovernmental organization</td>
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<tr>
<td>NIMBY</td>
<td>“Not in my back yard”</td>
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<td>NPI</td>
<td>Nonpharmaceutical intervention</td>
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<tr>
<td>PHC</td>
<td>Participatory health council</td>
</tr>
<tr>
<td>PM</td>
<td>Particulate matter</td>
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<tr>
<td>RISE</td>
<td>Revitalising Informal Settlements and their Environments Programme</td>
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<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
</tr>
<tr>
<td>SWM</td>
<td>Solid waste management</td>
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<tr>
<td>THRIVES</td>
<td>Toward Healthy Urbanism: Inclusive, Equitable, Sustainable</td>
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<tr>
<td>TIP</td>
<td>Targeted, integrated, and prepared</td>
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<tr>
<td>TOD</td>
<td>Transit-oriented development</td>
</tr>
<tr>
<td>TWRP</td>
<td>Tuas Water Reclamation Plant (Singapore)</td>
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<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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<tr>
<td>WASH</td>
<td>Water, sanitation, and hygiene</td>
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<td>WHO</td>
<td>World Health Organization</td>
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</tbody>
</table>
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Overview
Introduction

Urbanization continues to increase rapidly on a global scale. Today, more than four billion people live in cities; by 2050, this number is projected to double, and nearly 7 in 10 people will live in urban environments. Cities are nexuses of economic and social activity and hubs for knowledge and culture. As they expand, so does their capacity—and their responsibility—to foster environments in which people can thrive.

Cities hold tremendous, often untapped potential to improve health: the proximity of people to services and infrastructure means easier access to health facilities and other essentials, population density can support economies of agglomeration which lower costs, and the concentration of human ingenuity fosters technological innovation to support health improvements.

However, cities can likewise give rise to significant health and environmental issues: overcrowding, air pollution, urban waste, and insufficient social protection, among other urban determinants, can lead to disease transmission, logistical difficulties in care provision, health disparities, chronic illnesses, and more. The breadth and seriousness of such urban health challenges tend to be greater in developing countries, but significant problems also exist in cities of the Global North.

The design and management of urban environments has profound impacts on the health and wellbeing of urban residents. A healthy city is one in which the health of humans and the functioning of their supporting environment are consistently and continually prioritized. It is critical that achieving the healthy city not be thought of as separate from the other goals of urban development. On the contrary, healthy city action necessarily transcends and links across development sectors, both directly and indirectly. Cities also impact non-urban spaces through urban-rural linkages, their influence on global supply chains, and other factors. As hubs with high throughput of people, goods, money, and ideas, cities—and the way we manage them—have substantial consequences beyond urban borders.

Cities can promote health and well-being with wide-ranging benefits. But for this potential to become a reality, policymakers and practitioners must identify and address gaps in planning, financing, managing, and integrating urban actions that promote health.

The Healthy Cities Report, accordingly, aims to provide policymakers and development practitioners with an action-oriented framework for achieving healthy cities. Informed by an extensive literature review, it draws on the wealth of World Bank experience in urban development, citing examples and case studies of healthy city successes and challenges globally. It also recognizes the
significant existing global efforts made by other stakeholders and partners on the healthy cities agenda, incorporating these lessons and practices.

The report seeks to reposition the role that cities play in improving human and ecosystem health. It functions as a high-level guide for practitioners in urban development, offering overarching recommendations for working towards healthier cities. It needs to be read with the understanding that every city faces specific challenges and will likewise require unique actions tailored to the local context. The report is structured around a framework with three broad areas for supporting healthy cities – targeted support, integrated action, and preparation for the future – known as the TIP framework, outlined below.

**Report Framework**

This report presents and applies the TIP framework for approaching healthy city action, focused on providing **targeted** support for the vulnerable, delivering **integrated** solutions for a healthier future, and being **prepared** for future health and climate crises. The TIP framework focuses on the critical role cities play in ensuring human and ecosystem health and suggests both cross-cutting and specific actions as part of a strategic approach for achieving sustainable healthy cities.

*Figure E.11. An Action-Oriented Framework for Healthy Cities*

Note: “NCD” stands for “noncommunicable disease.”
Healthy Cities

**Targeted Support**
Health within urban contexts varies significantly across and within different populations. Unsurprisingly, poor and vulnerable populations are the most susceptible to the health risks associated with urban life, and the least likely to reap the benefits of positive urban innovation. This reality demands a targeted approach to account for inequity, building safeguards into urban planning and management to ensure that no one is left behind.

**Integrated Action**
The health and environmental challenges that cities face are complex, interrelated, and wide-reaching. Approaching them narrowly will yield fragmented, incomplete results and can create new problems. It is therefore critical that healthy city action be intersectoral and systems oriented. A healthy city perspective must be incorporated into all sectoral development work, broadly incorporating health-relevant sector-specific interventions (solid waste management, water and sanitations, food systems, green spaces, etc.). Of equal importance, this integrated approach also requires coordination between sectors to improve efficacy and efficiency and reduce unintended consequences.

**Preparation for Future Crises**
As the world changes, so does the nature of the crises we face globally. It is crucial that healthy city action therefore take a forward-looking, long-term perspective, meeting the needs of the present while anticipating those of the future. This holds especially true with respect to the accelerating impacts of climate change at all scales. In many cases, cities link climate agendas with healthy city plans in recognition of their deep interconnectedness. A shift to longer-term anticipatory planning can mediate against these and other crises, including future pandemics, disasters, economic shocks, and others.

The report is divided into five chapters: Chapter 1 introduces the issue of healthy cities, outlining the history and importance of this work. Chapter 2 introduces three contemporary issues that are reshaping health city action: equity, climate change, and COVID-19. Chapter 3 analyzes examples of healthy city action by the World Bank and other stakeholders. Chapter 4 addresses institutional and financial challenges in healthy city action. Chapter 5 summarizes key takeaways and provides recommendations for policymakers and practitioners.
Contemporary Issues Shaping Healthy City Action

**Equity** is a pillar of the development agenda at large—indeed, “Leave no one behind” is one of six guiding principles of the UN Sustainable Development Cooperation Framework. Cities generally have more advanced educational and economic opportunities than rural areas and likewise tend to experience better health. However, the most disadvantaged groups in urban areas often have the poorest health outcomes, worse even than those in rural areas, underscoring the vast disparities in health outcomes within cities.

Spatial issues like urban sprawl, informal settlements, segregation, and gentrification can perpetuate inequities among socioeconomic and cultural groups in cities, reinforced by poor use of resources, discrimination, power disparities, and other factors. These inequities lead to significant differences in health outcomes, like life expectancy, risk of both noncommunicable and infectious diseases, accidents and injuries, and more.

But there is potential to address these gaps: improved urban policy and planning that seek to resolve such systemic inequities could yield tremendous improvements in health. Issues of equity impact every aspect of healthy city action and are an essential element of the targeted component of the TIP framework.

The impacts of climate change are rapidly increasing, with escalating repercussions for human and ecosystem health. Indeed, the World Health Organization has declared climate change the greatest health threat of the 21st century. A wealth of evidence underscores these impacts, but also, increasingly, the potential health benefits of climate action.

Climate change, cities, and human health are strongly interlinked. The health and economic impacts of climate change are often amplified in urban contexts. The ability of urban populations to respond to and avert climate-related health risks varies significantly based on income, vulnerabilities, and local context, and economic impacts often lead to health consequences later. At the same time, cities are massive drivers of greenhouse gas emissions and broader environmental degradation, and thus contribute to many of the health impacts they seek to resolve.

However, the strong link between climate change and urban health also has a positive implication in that the solutions to each are often interrelated, such that climate action can simultaneously benefit human health. Investments in climate adaptation and mitigation produce enormous social and environmental co-benefits, such as improvements in urban quality of life, clean air and water, social inclusion, and job creation, eventually contributing to urban health. Growing recognition of this reality has fueled work that tackles threats to both humans and ecosystems. For example, in 2021, when the World Bank announced its new
Climate Change Action Plan, cities were included as one of five critical systems for climate change transformation. This linkage between climate change and urban health necessitates a broad, inclusive approach to healthy city action and is a critical element of the integrated component of the TIP framework.

The COVID-19 pandemic underscored deficiencies in our systems for responding to health emergencies and for ensuring health more broadly. This is equally true for cities as the pandemic highlighted their ill-preparedness to respond to health crises. Cities were epicenters of the emergency, acting as global gateways for transmission. In many contexts, uncontrolled density, poorly managed healthcare systems, and/or deficient emergency response systems and protocols contributed to poorer outcomes. As such, the pandemic has served as a telling test of urban governance and capacities, while bringing urban inequities into stark relief.

While the COVID-19 crisis led to overwhelming loss of life and exposed flawed systems and procedures, it also prompted adaptations in many cities that improved conditions for citizens, and made clear the role that urban areas play in ensuring resilience and social cohesion in the wake of disaster. In many ways, it has presented cities with an opportunity to “build back better.” Changed ideas around the use of urban space may very well be the most profound legacy of the pandemic, shifting the relationship between employers and employees, drawing new mobility patterns and systems, and relocating the centers of business and social activity in urban spaces.

Achieving healthy cities will depend in large part on the extent to which cities adopt the lessons learned from the pandemic to better prepare for the next health disaster, including those arising from climate change. And while COVID-19 called attention to the importance of healthy city action, future challenges are likely to compound and reinforce one another in ways that justify a much greater focus on health-focused urban planning to build more resilient, inclusive cities. In this way, the COVID-19 pandemic reinforces the importance of preparedness in the TIP framework.

**Action Areas for Achieving Healthy Cities**

Below are eight key domains within which cities can enhance urban health (see Chapter 3 and 4 for more details and examples).

1. **Adequate housing that protects urban residents from disease and security risks.** Much of the world’s urban population lacks access to safe, adequate housing, rendering residents vulnerable to a range of health risks. Modest improvements to housing can often yield significant health benefits. Poor housing is a particular challenge in informal settlements, which concentrate the most disadvantaged groups in society.
2. **Public spaces that provide shelter from environmental and other hazards.** Health risks associated with global warming and climate disasters are abundant and increasing. These impacts are amplified by urban phenomena like overcrowding, air pollution, congestion, and others. Vulnerable groups are typically more exposed to ecosystem health risks and poor or otherwise marginalized groups are more likely to experience irretrievable losses. That is why it is key that cities create public spaces that mitigate these risks while enhancing quality of life.

3. **Transportation systems that ease mobility, foster wellbeing, and facilitate social and economic activity.** Transportation has an enormous impact on human health in cities, affecting stress, noise, air quality, road traffic accidents, violence and harassment, and other safety issues. It also affects the environment and influences social and economic behavior. As with other systems, the negative impacts of transportation disproportionately affect vulnerable populations.

4. **Equal access to high-quality health care that responds to community need and addresses the issues facing vulnerable populations.** Large disparities in quality and accessibility of health care exist in most cities, especially in developing countries. Poor, vulnerable populations generally have the least access and worst quality of care. Where public options are lacking, urban dwellers often rely on private, for-profit facilities, with large out-of-pocket expenses that can trap them in poverty. Informal settlements tend to have fewer health facilities and workers per capita than other areas, and cost is a significant barrier to access for many residents.

5. **Clean and safe water and sanitation systems that hinder disease transmission and ensure environmental health.** Although WASH and waste management systems are often the single largest expense for local administrators, they often fail to safeguard human and ecosystem health in developing-world contexts. Damaging impacts include inadequate water supplies, contaminated drinking water, open dumps and landfills that leach toxic chemicals, significant greenhouse emissions, and others. Cities experiencing fragility and conflict often face additional barriers to providing safe WASH services. Environmental challenges like drought and flooding can further exacerbate anthropogenic risks.

6. **Food systems that guarantee nutritious, accessible and affordable food for all.** Poorly designed and/or managed food systems can contribute significantly to health and ecosystem harms. Malnutrition is the leading global cause of death, disproportionately affecting poor and vulnerable communities. Urban growth squeezes food systems as cities displace productive agricultural land while increasing demand for agricultural...
outputs. Food systems can have harmful environmental impacts, including through enormous greenhouse gas emissions, harmful chemical fertilizer use, depletion of soil and groundwater, and loss of biodiversity. Moreover, a third of all food produced for humans is wasted or lost.

7. Effective and efficient institutions that foster urban health. A lack of effective institutions is a significant barrier to achieving healthy cities, particularly in developing countries. Among the most significant challenges that affect health is managing the balance of power among national and local authorities. Decentralization—less common in developing countries—can empower local governments to address health, but they still tend to depend on national policy decisions given the need for funding. More generally, dedicated institutions are needed to manage healthy city actions.

8. Sustainable funding sources that allow for future planning. Most cities face significant funding shortfalls; particularly in the developing world, this leaves them much more reliant on NGOs, philanthropic support, and other private sources that are unregulated and unreliable. Informal settlements are particularly challenged, as neither cities with informal settlements nor the residents of informal settlements themselves typically have access to adequate resources.

Way Forward: Healthy Cities in Actions

This report explores the means through which cities can promote health across sectors and provides policymakers and practitioners with an action-oriented framework for creating healthy cities building on an extensive body of evidence, and World Bank experiences from around the globe. Each of the eight action areas discussed above comprises a set of policy recommendations following the TIP framework, which can serve as specific entry points for a broader approach toward healthy cities (see Chapter 5 for more details).

While the overarching recommendations apply to all cities, the optimal mixture of actions will always depend on local capacities and resources, risks and challenges, and cultural and social preferences. The World Bank is committed to furthering the healthy city agenda, working closely with cities and development partners to identify specific urban challenges and tailored solutions. This will require a concerted mobilization of actors across sectors in the public and private domains, as well as cooperation at the local, regional, and national levels of government.

ENDNOTE

Introduction

Against a backdrop of dynamic global change and growing uncertainty, the idea of healthy cities—of cities as engines for human and environmental well-being—is attracting more attention in research, policy, and practice.

Cities face interrelated health challenges. Crowding in cities, for example, often exacerbated by inadequate economic security or social protection, drives infectious disease dynamics not seen in rural spaces. Accumulating urban waste can harbor infectious disease vectors, fostering transmission, and can lead to toxic exposures. Large urban populations present serious logistical challenges for service delivery, compounded during emergencies, and urban density generates other negative externalities, including air pollution, traffic, and heat. Informal settlements concentrate and compound many of these challenges. These interconnected examples—just a few among countless others—speak to a broader need for an integrated urban approach that spans sectors and scales.

Urban complexity and density also generate unique opportunities to improve health, however. The proximity of people to businesses, services, and infrastructure creates economies of scale and agglomeration, lowering costs and facilitating access to urban amenities, including health facilities. City governments have structures and competencies, albeit varying by context, that allow them to take action to promote health beyond what is generally possible in rural areas. Knowledge and cultural production are overwhelmingly concentrated in cities, as is innovation. Nearly all patents, for example, come from urban areas. This means cities are in a unique position to apply human ingenuity to even the most pressing health challenges.

Cities can thus be powerful forces for good. Countless examples show how a wide range of urban investments, policies, and processes can improve health, from the sanitation and housing improvements that swept 19th century cities to today’s climate-smart approaches to land use and transportation planning. Most recently, the COVID-19 pandemic has reinforced the essential role of cities in this regard. Indeed, close relationships with residents and the immediacy of city-led action make them a natural intervention point for human health, and with their outsized contribution to greenhouse gas emissions and other environmental stressors, they are vital to safeguarding the environment. Moreover, the pathway toward creating a healthy city can be transformative for other sustainable urban development goals.
To achieve their potential for health, cities need to identify and close gaps in planning, financing, managing, and integrating urban actions that promote health. Drawing upon experiences from cities around the world, this report aims to provide policymakers and practitioners from different sectors with an action framework that consolidates healthy city principles and actions.

1.1 Setting the Stage: The Evolution of Healthy Cities

Although the idea of healthy cities is not new, the engagement of cities with health and well-being has undergone continual conceptual and practical evolution. Indeed, the history of cities features a longstanding struggle against evolving health challenges (figure 1.1). From the plagues of antiquity—newly relevant in the COVID-19 era—to the noncommunicable diseases prevalent in many cities today, cities have faced a multiplicity of trials.
Archaeological findings and historical records show that health was a motivating factor behind the rise of the very first cities and has been core to their management and development ever since. The earliest cities built walls to keep out marauding beasts and hostile enemies and passed laws to regulate violence, also freeing up citizens for economic and social pursuits and fostering the rise of modernity (Frye 2019). Stormwater drains were present in Mesopotamian cities nearly 6,000 years ago, and sophisticated urban sewage and sanitation systems arose across the ancient world (International Water Association 2007; De Feo et al. 2014; Tulchinsky and Varavikova 2014).  

Isolation to combat infectious disease was common from biblical times—as, indeed, referenced in the Bible and seen in ancient China, Egypt, and the Middle East, among others (Tulchinsky and Varavikova 2014; Huigang et al. 2020; Zheng 2020). Ancient Chinese cities and others practiced animal control long before the Christian era (Tulchinsky and Varavikova 2014). Hospitals cared for the sick and dying in medieval cities throughout Europe. Cities in antiquity also promoted social and spiritual well-being—for example, by constructing places of communal worship. Meanwhile, they managed risks from fires, floods, and droughts; heat, cold, and extreme weather; food shortages; pests and vermin; and noise pollution, all evidence of a profound mandate for securing health and well-being.

Modern systematic quarantine and infection control derive from the responses of 14th century European cities to the Black Death. Beginning in 1347, the deadliest pandemic in human history killed 30–60 percent of the European population, reshaping the demography, culture, and economy of cities and persisting in some places until the 18th century (Tognotti 2013; Wade 2020). While its cause was unknown until 1894, person-to-person spread was well appreciated. Beyond quarantine, cities regulated burial practices and attempted to reduce urban density to suppress transmission (Varlik 2015).  

The Industrial Revolution posed momentous new challenges for urban health. These included new environmental risks, such as air pollution; poor working conditions; growing urban populations (and, thus, growing demands on resources and services); overcrowded, unsanitary living conditions; and increased global and interurban connectivity that fostered the spread of infectious diseases (Institute of Medicine 1988). Urbanization also strained waste management systems, leading to the contamination of drinking water and outbreaks of typhoid and cholera (Tulchinsky 2018). While the miasma theory—the belief that disease originated in decay and exposure to noxious air—motivated a broad movement to improve urban cleanliness (Burian et al. 2000), it was not until 1854 that London physician John Snow found evidence that tied cholera to contaminated water (Tulchinsky 2018). This discovery soon led to innovations in water, sanitation, and hygiene (WASH) worldwide (Serhan
Healthy Cities

2020). Notably, despite significant advances in public health, industrializing cities in the centuries since have often faced similar issues.

Modern public health emerged to meet the needs of the industrial era, bolstered by a flourishing understanding of the scientific basis of infectious disease and closely tied, at first, to urban planning. Indeed, the social, economic, and health consequences of rapid industrialization and urbanization led to the rise of new, health-centered urban models. In the United Kingdom, the Garden City concept emphasized decentralization and harmony with nature to balance the benefits and disadvantages of urban living (Nadh V S 2020). In Paris, Baron Haussmann—not without controversy—remade the city around a series of avenues (the “Grands Boulevards”) and an extensive sewage system, facilitating mobility by bringing nature, air, and light to the city center (Willsher 2016; Karnik 2020). By the early 20th century, urban planning was a formalized field of study and practice (Sarkar, Webster, and Gallacher 2014), and in 1916, New York City developed the first citywide zoning code (Willis 2016), separating residential areas from industrial zones. Other cities across the United States followed suit, seeking to regulate land use to protect community health, safety, and welfare.

Meanwhile, public health and biomedical advances yielded significant gains in health and longevity. Major infectious diseases, including smallpox, typhoid fever, and tuberculosis, declined in the 20th century as a result of both a general increase in economic development and improved understanding of disease causation. One major exception was the Spanish Flu pandemic of 1918, which caused from 50 million to 100 million deaths worldwide (Institute of Medicine 2005), with major impacts in cities. That pandemic is credited with catalyzing a shift toward more universal approaches to health care and improved disease surveillance (Spinney 2017). While the new public health strategies and technological innovation led to major successes in disease control, however, the experience of COVID-19 suggests key lessons of the Spanish Flu era were not effectively internalized by urban systems, policy, and practice.

Even as public health achieved many successes, it became progressively more isolated from urban planning and management (Corburn 2012), partly because of a shift in focus from environmental determinants of health toward treatment (Rosner 2010). Today, as people are living longer, and increasingly subject to overconsumption, urban environmental exposures have accelerated increases in the global burden of noncommunicable diseases (NCDs), such as diabetes and cardiovascular disease (Barton and Grant 2006). A key factor accentuating environmental risks in cities in the 20th century was the automobile, which reshaped cities around the world, perpetuating urban sprawl, combustion of fossil fuels, and high levels of sedentarism. Among other consequences, modern industrialization, characterized by car-centric planning, massive growth
in industrial production, and, often, energy derived from the burning of fossil fuels, has generally led to declining air quality. The “Great Smog of London,” for example, a severe air pollution event in 1952, led to high mortality and morbidity and, subsequently, the enactment of the United Kingdom’s Clean Air Act (Brimblecombe 2006).

Indeed, the past half-century saw an explosion of environmental activism and subsequent regulation. From antecedents in natural conservation, the environmental movement of the 1960s and ’70s coalesced around pollution (from, for example, pesticides and oil spills) and nuclear testing, progressing to acid rain and protection of the ozone layer, and eventually encompassing the modern climate change movement. Environmental activism shaped cities by stimulating the creation of concrete policy instruments like the United States’ 1990 Clean Air Act Amendment and, more fundamentally, through its influence on the basic tenets of sustainable development.

Meanwhile, today’s cities have ushered in radically new challenges. These include the complex and massive environmental impacts of unprecedented urbanization and industrialization; the rise of noncommunicable diseases, mentioned above; vastly increased global connectivity that can amplify pandemics; demographic transformations and rapidly aging populations; and, increasingly, the health impacts of climate change. More importantly, the ongoing separation of public health from urban design, planning, and management means that modern cities often miss opportunities for health improvement and, indeed, contribute to ill health along a range of direct and indirect pathways (Galea and Vlahov 2005).

Together, these emerging urban health challenges have driven a new impetus to recenter urban policy and practice on health, first formally articulated by the World Health Organization (WHO) Healthy Cities initiative in the 1980s, but since adopted by cities around the world (Hancock 1993; Tsouros 2019). The WHO Healthy Cities movement, which began in Europe, has spread to over 1,400 local municipalities and inspired related efforts internationally (Barton and Grant 2013; Tsouros 2015). Deeply rooted in a recognition of the role of local government in securing health, it has focused strongly on health promotion and the social determinants of health (Barton and Grant 2006).

More recent discourses have sought to emphasize linkages between human and ecosystem health, especially in the context of the new field of planetary health.² The Toward Healthy Urbanism: Inclusive, Equitable, Sustainable (THRIVES) framework, for example, emphasizes the interconnectedness of decisions and outcomes across scales from local to global, with planetary health at the center of the healthy urban environment (Pineo 2020). Related intellectual movements have emphasized other superpositions of the determinants of
health. One Health focuses on the relationships between human activity and the environment, particularly between human and animal behavior and infectious disease risk (World Bank 2022). Drawing on these and other frameworks, dozens of cities worldwide have laid out their own healthy city plans.

### 1.2 Taking Healthy Cities Forward

Despite concerted efforts since the emergence of the Healthy City movement, cities still grapple with infrastructural, institutional, and financial challenges that significantly impede progress toward health. Ever larger and more complex flows of urban resources and information pose critical challenges for urban organization and management, while short-term political cycles undermine long-term planning, and cities depend on hard-to-obtain intergovernmental fiscal transfers. As observed during the COVID-19 pandemic, an explosion of health misinformation brought about by the proliferation of social and traditional media challenges effective communication and the implementation of health policy. The pace of technological innovation threatens to outstrip the capacities of governance. Meanwhile, aging populations induce a whole new range of urban preferences, needs, and responsibilities.

These challenges are far more complicated in developing countries. Indeed, the prototypical rise and fall of major urban health challenges in developed countries over the past several centuries is not neatly replicated in low- and middle-income countries. Developing areas often progress along a compressed time frame within which different health issues coexist at high levels—the so-called “triple burden of disease,” represented by the combined impact of infectious and noncommunicable diseases, injuries, and violence, as well as mental health issues, equity challenges, and others (WHO 2021c). The long-term risks to health and well-being from environmental change add a new dimension to urban planning everywhere, but developing-world cities face the greatest risks and uncertainties (Watts et al. 2015). Significant, persistent resource and capacity deficits further complicate the situation.

A new operational framework that focuses more squarely on the central role played by the city in ensuring human and ecosystem health can guide urban policymakers and practitioners toward sustainable and healthy urban development. Cities generally occupy one layer in a broad, scaled set of health determinants in existing frameworks, which have been useful in understanding the complexity of urban health pathways. The role of cities themselves, however, has become increasingly visible in issues ranging from climate action to air quality and dramatically reinforced by the experience of COVID-19.
Indeed, the pandemic has driven home the importance of a public health lens in reimagining the city for a dynamically complex and uncertain future. Health-focused urban planning and management is vital to making cities resilient, inclusive, and competitive in the face of future shocks. Such shocks are likely to be complex, to feature compounding risks, to pit stakeholder interests against each other, to worsen existing inequities, and to exploit deficiencies in cooperation and communication.

The framework presented here aims to focus the urban actions and systems of cities on “TIP”—that is, on providing targeted support for the vulnerable, delivering integrated solutions for a healthier future, and being prepared for future health and climate crises (figure 1.2).

Figure 1.2. An Action-Oriented Framework for Healthy Cities

Note: “NCD” stands for “noncommunicable disease.”
First, targeted support for vulnerable people and communities is crucial to achieving “healthy cities.” Typical processes of urban planning, management, and financing have strongly differential impacts, with some individuals and communities benefiting less from urban goods and suffering more from urban ills, as discussed in detail in chapter 2. The pursuit of health equity as part of a broader health strategy is not only an ethical imperative but also a matter of self-interest. Ill health in one segment of society imposes direct costs, reduces productivity and innovation, and often induces internal conflicts that reduce social capital and trust. It can also propagate, either directly, as with infectious diseases, or indirectly, through cascading economic failures, migration, or other processes.

Cities have an important role to play in identifying the vulnerable and minimizing health risks through targeted support. A first step is identifying groups—especially intersectional populations with multiple vulnerabilities—who face compounding health risks. A strong evidence base allows for strategies and interventions to meet identified needs, minimize health risks, and increase equity with respect to the delivery of urban policy, infrastructure, and services. Chapters 3 and 4 provide examples of how cities can improve health equity through, for instance, financing and interventions for the upgrading of informal settlements. Healthy cities also create equitable opportunities for urban dwellers to make healthy choices and fulfill their own needs. They consider both their own citizens and their extra-urban impacts, including proximal impacts, like pollution and ecosystem degradation in urban hinterlands, and wider regional or global environmental and social impacts.

Second, the complexity and interrelationships of multisectoral pathways to urban health demand integrated actions and strategies. Health, per the World Health Organization, is not merely the absence of disease, but a state of complete physical, mental, and social well-being (WHO 2020a). Given that cities comprise the built, natural, and social environments within which urban populations live and work, most actions taken by or within a city, regardless of sector, affect health. Complex relationships between urban features and health call for a well-curated, mutually supportive package of urban policy, infrastructure, and services. Yet, political, informational, and other phenomena have led to fragmented decision making and consequent health penalties. A particularly important source of such fragmentation, as noted earlier, is the progressive isolation of the health function (often encapsulated in the formal health sector) from other aspects of urban planning and management (Corburn 2012; UN-Habitat and WHO 2020).

Maximizing health benefits for cities requires not only the sector-specific identification of gaps and interventions but the coordination of processes to ensure decisions capitalize on synergies and avoid conflicts and unintended consequences. Chapter 3 reviews in detail major urban sectors, including healthy, low-carbon spaces; water, sanitation, and waste management; sustainable food
systems; and equitable health service provision. Intersectoral coordination to improve efficiency and effectiveness can take many forms, including new mechanisms or channels for communication between health and other sectors or oversight through dedicated institutional structures, among others; chapter 4 provides examples.

Third, urban systems need to be prepared for future health and climate crises, whether arising from acute shocks, like pandemics and extreme weather events, or from slow-onset challenges, like demographic and climate change. Assessing current and future health risks is particularly important. The last half-century has seen unprecedented change for cities, and, given the realities of global environmental change and the unprecedented pace of social and technological innovation (discussed in chapter 2), the next half-century will likely be equally or more disruptive. Notably, some cities have linked their healthy city plans to their climate and resilience strategies, recognizing the future risks to human health posed by climate change, while other cities have integrated health into longer-term master plans or have developed standalone healthy city plans (see chapter 4).
A strong evidence base will enable cities to plan for healthier and more resilient futures. A first step is to gather comprehensively and assess evidence on urban health outcomes and risk factors at different scales, using both traditional methods and sources, such as national censuses and demographic and health surveys, and novel ones, such as mobile phone positioning, social media, and the Internet of Things (Kamel Boulos and Al-Shorbaji 2014). The use of remote sensing offers ample opportunities for assessing neighborhood-level determinants of health (Thomson et al. 2019), while participatory methods like the mapping of informal settlements offer otherwise unobtainable insights for marginalized groups.

More broadly, a crucial step in preparedness is to incorporate principles of risk reduction and resilience into medium- and long-term healthy city planning (Bahadur, Ibrahim, and Tanner 2013). Among potentially valuable interventions are early warning systems, incident response exercises or stress tests, emergency action plans, scenario mapping and analysis, and planning for systemic failure—for example, by incorporating features to improve passive survivability in buildings when critical systems fail, which can save lives during emergencies (Baniassadi et al. 2019). The gold standard for disaster risk reduction is the “all-hazards” approach—that is, an approach that broadly improves readiness and strengthens response to a wide range of hazards. The UN Office for Disaster Risk Reduction, in collaboration with the International Science Council, has produced a set of 302 hazard information profiles that can be a useful starting point for assessing risks (Murray et al. 2021).

The effective use of evidence and implementation of healthy city plans requires the establishment of adequate institutional and financing systems. Healthy city action depends on institutional coordination across sectors, scales, and actors, and adequate, sustainable financing mechanisms—themselves often dependent on local institutional factors, like the degree of decentralization and of institutional and planning capacity, among others. In many cases, participatory decision-making processes are key to effective institutional performance, creating and strengthening shared narratives and trust, coordinating action, and opening avenues to otherwise inaccessible evidence. Indeed, a key lesson of the COVID-19 pandemic is the necessity of building shared narratives and trust through participation for effective, rapid decision making in health crises (McClure 2021).

While the TIPs framework is intended to cover the most important elements of healthy city action, it is necessarily not exhaustive. Further guidance for healthy cities is offered by the extensive literature on placemaking, urban resilience, and
Healthy Cities

sustainable urban development (see, for example, Bahadur, Ibrahim, and Tanner 2013; Schipper and Langston 2015; and Botchwey, Dannenberg, and Frumkin 2022). The following chapters provide more details, along with actual examples. We highlight two additional key considerations:

• A joint focus on human and ecosystem health as an imperative that supports broader development goals. Ecosystem health feeds back into human health, as has been widely recognized. In some cases, this relationship is a tight one, with immediate consequences; in others, effects may not be felt for years or even decades. The causal pathway from ecosystem to human health is a foundational rationale for sustainable development (Whitmee et al. 2015). Ecosystem health is, thus, considered in this framework not as an arbitrary expansion of the role of healthy cities but in recognition that the functioning and stability of ecosystems is integral to human health. Cities also offer some of the most exciting opportunities to promote simultaneously human health and environmental sustainability.

• Multiscale impacts of cities on health. The health impacts of cities are multiscale, both within and beyond urban boundaries. The well-developed field of greenhouse gas (GHG) emissions accounting shows that urban emissions are not limited to those generated within cities; rather, they can arise from urban activity well beyond city boundaries, either from the distant consumption of locally produced goods and services or during the production of goods elsewhere to meet local urban demand (Rees and Wackernagel 1996; C40 Cities 2018). Likewise, city actions affect ecosystems not only both within and
near the city but also at regional and planetary scales. Collectively, cities are responsible for the lion’s share of pressure on planetary systems (Hoornweg et al. 2016; C40 Cities and Ramboll 2020).

In sum, drawing on the WHO definition, we define a healthy city as one that continually creates and improves its physical and social environments by acting to promote equitably the health of people and natural systems at all scales, including by enabling partnerships among diverse stakeholders. The “creation” and “improvement” envisioned in this high-level definition is situational and progressive. Not all cities have the resources to implement a holistic urban health plan, and, indeed, in many cities in developing countries the priority will be to ensure the provision of basic services, such as water and sanitation, that underpin health. Yet, even in such contexts, all cities can act to improve the current state of human and ecosystem health, to foster equity, and to enable and foster partnerships. Cities can explore more complex and holistic actions as their capacities and resources grow.

1.3 Roadmap of the Report

This report presents an action-oriented healthy city framework, informed by an extensive review of the literature. It draws on commissioned background papers to highlight real-world efforts to improve human and environmental health in Dhaka, Bangladesh; Kigali, Rwanda; Kobe, Japan; Medellín, Colombia; and Shanghai, China. In addition, it uses case examples from across regions and income levels to tease out healthy city successes and challenges. While health care systems are essential to healthy cities, the expanded definition above allows for a broader consideration of the myriad urban features that shape human and ecosystem health.

Chapter 2 addresses one motivation for this work: the need to contextualize and reshape healthy city action in light of three defining contemporary issues—equity, climate change, and COVID-19. Chapter 3 explores examples of healthy city action across a set of sectors and domains, highlighting a few nexus issues and providing concrete examples from World Bank projects and beyond. Chapter 4 discusses how to tackle institutional and financial challenges in the planning and implementation of healthy city action. Chapter 5 summarizes key insights and provides recommendations for cities to advance healthy city action.
ENDNOTES

1 See, for example, Tulchinsky and Varavikova (2014): “Chinese, Egyptian, Hebrew, Indian, and Incan societies all provided sanitary amenities as part of the religious belief system and took measures to provide water, sewerage, and drainage systems. These measures allowed for successful urban settlement and reinforced the beliefs upon which such practices were based.”

2 Initially supported and developed by the Rockefeller Foundation and The Lancet, the field of planetary health encompasses “the health of human civilization and the state of the natural systems on which it depends.” It recognizes that human health and the health of our planet are inextricably linked, and that our civilization depends on human health, flourishing natural systems, and the wise stewardship of natural resources (Whitmee et al. 2015).

3 Some have suggested modified versions of the all-hazards approach. “Top hazards” approaches, for example, focus more squarely on hazards with a high probability of occurring in particular localities (Gregory 2015; Bodas, Kirsch, and Peleg 2020).

4 See, for example, Boyden’s seminal work on “biosensitive” societies (Boyden 2016).
The Next Decade: Defining Issues for Healthy Cities

In recent years, three issues have disrupted policy discourse at the local, national, and global scales: equity, COVID-19, and climate change. Each has given rise to significant social and cultural change while strongly affecting political and policy agendas and outcomes. Each implies a need for targeted support, integrated action, and prepared systems. These issues will shape the policy environment for healthy cities for the next decade. This chapter discusses each in turn.

2.1 The Growing Demand for Health Equity

Issues of equity and inclusion have risen to the forefront of development agendas at all scales. The commitment to “Leave No One Behind,” for example, is at the core of the Sustainable Development Goals (SDGs; Marmot and Bell 2018). With regard to climate change, the “loss and damage” discourse recognizes that poorer, more vulnerable countries need compensation for rising climate impacts and support for adaptation actions, and environmental justice is gaining prominence in global climate discussions. Environmental justice has also become important at the city level, as vulnerable groups, including targets of historical and current discrimination, face more serious risks from a range of environmental factors.

Healthy city action during the coming decade will have to grapple with multilayered and intersecting health equity issues, recognizing how the urban fabric imposes and perpetuates inequities among urban residents and others who interact with cities. The WHO has long recognized the importance of urban health inequities—for example, through its pivotal work regarding the social determinants of health (Marmot et al. 2008) and the development and widespread implementation of the Urban Health Equity Assessment and Response Tool (Urban HEART; Prasad et al. 2018).

At a basic level, urbanization generally promotes better health outcomes. Modern advances in health care and conditions of urban living have largely turned the “urban penalty” that applied in premodern cities (see chapter 1) into a dividend (Sarkar, Webster, and Gallacher 2015). Urban dwellers today are healthier, on average, than rural populations. In the United States, based on a study of statistics
from the period 1969–2009, life expectancy for residents of large cities was 2.4 years greater than in rural areas, a gap which has widened in recent decades (Singh and Siahpush 2014).

Urban health advantages reflect better access to and quality of infrastructure and services and greater scope for supportive policy and institutions. Well-planned density, for instance, contributes to economies of agglomeration, in which the proximity of various economic activities reduces costs. Proximity increases opportunities for social and economic interaction while improving access to such critical services as health facilities and safe drinking water (figure 2.1). Cities also improve health indirectly by expanding access to educational and economic opportunities, with profound impacts—for women, for example.

Figure 2.1. Access to Electricity and Safe Drinking Water by Degree of Urbanization

Source: EC Degree of Urbanization and DHS surveys (European Union 2020).
Note: “Degree of Urbanization” refers to a new method for classifying cities, towns, and rural areas in a consistent, comparable manner by using global data on population size and density. It redresses the problematic reliance on national definitions, which differ widely in what is classified as urban. The Degree of Urbanization was jointly developed by multiple international organizations, including the European Commission, the International Labour Organization, the Food and Agriculture Organization, the Organisation for Economic Co-operation and Development, UN-Habitat, and the World Bank, and was endorsed by the UN Statistical Commission in 2020 (European Union 2020).
Yet, this generalized positive view masks significant health inequalities and disbenefits among and within cities. Disadvantaged urban populations generally experience the poorest health outcomes, often worse than in rural areas. Rapidly urbanizing cities in developing countries in particular may have difficulty allocating scarce resources to growing populations and maintaining health-critical institutions, infrastructure, and services (Prasad et al. 2018). This is especially true of cities burdened by conflict, fragility, or violence. Systemic spatial processes can inadvertently reinforce healthy inequity, as illustrated by the following:

- Urban sprawl, generally characterized by low density and excess road construction, is associated with higher greenhouse gas emissions, worse air pollution, more intense urban heat island effects (see box 2.1, below), and higher automobile dependency (Frumkin, Frank, and Jackson 2004). The well-characterized health effects of sprawl include respiratory and cardiovascular impacts from air pollution, road traffic injuries and fatalities, cardiovascular impacts from increased sedentarism, reductions in water availability and quality, exposure to heat (Stone, Hess, and Frumkin 2010), mental health and safety issues associated with commuting, and decreased social capital (Frumkin 2002). Most of these are inequitably distributed, with minorities and the poor more greatly affected. In addition, because sprawl reduces density, it limits many positive effects of urban space, such as easier access to health and social services, nutritious food, and other amenities.

Informal settlements are characterized by poor infrastructure and services (such as water, sanitation, and electricity), unclear land tenure, and poverty. They often result from unplanned growth or the deterioration of previously well-integrated areas. These settlements present the most serious health equity challenges. Child mortality in poor urban neighborhoods can equal or exceed that in rural areas (Garenne 2003) and contrasts powerfully with wealthier parts of the same cities; in Nairobi, Kenya, for example, the child mortality rate in informal settlements was 1.5 times higher than the city average (Kimani-Murage et al. 2014). Moreover, because cities rarely have comprehensive health data for informal settlements, they are constrained in health planning and resource allocation (Riley et al. 2007).

- Residential segregation is often an unintended consequence of regenerating urban areas. Generically, any improvement to an urban neighborhood, such as better transportation, new employers, new services, or upgraded parks, tends to increase its land value, which in turn attracts wealthier residents and businesses and further improvements, pricing out poorer residents and businesses over time. This can reduce local social capital and alter the ethnic composition of such communities while displacing former residents to areas.
where they experience higher health risks. Such residential segregation by social class promotes the differential spatial distribution of goods and services, again with consequences for health (Diez Roux 2016).

At a finer scale, health inequities often arise from deficient or poorly managed urban infrastructure and services, resulting in excess exposures and health risks for affected groups. Health inequities can reflect gender, age, and disability status, membership in otherwise marginalized groups, or migration status. The following examples illustrate the health implications of unevenly distributed urban resources at different scales; chapters 3 and 4 discuss solutions in more detail:

**Housing** affects health equity along multiple pathways. Poor-quality, insecure housing is more common among racial and ethnic minorities, women, the elderly, and the poor and in fragile and conflict-affected states. Such housing is more likely to expose residents to toxic pollutants (such as lead and air pollution), disease pathogens and vectors, allergens, extreme temperatures and weather, and safety and security issues (Hood 2005; WHO 2018). Globally, indoor air pollution alone is responsible for an estimated 3.8 million premature deaths per year (WHO 2018b). Poor housing is also often associated with obesogenic or otherwise high-risk food environments, unhealthy crowding, noise, inadequate sanitation, and mental health stressors, like violence and isolation (Hood 2005; WHO 2018b). Highly vulnerable groups carry exceptional burdens; internally displaced persons and refugees, for example, often face multiple housing-related environmental health risks, especially in refugee camps (Habib, Basma, and Yeretzian 2006).

**Green space** is highly unequally distributed within and between cities. Cities in high-income countries provide, on average, 4.5 square kilometers of green areas per 10,000 residents, four times higher than cities in low- and middle-income countries (figure 2.2). Access to green space can also vary significantly across cities within a country. Residents of cities across Africa, Asia, and Latin America experience unequal access to urban green space based on socioeconomic status or race (Rigolon et al. 2018). Furthermore, equal use of green space can be hindered by inaccessible design, primarily for the elderly or people with disabilities, and by perceptions of safety (or the lack of it) on the part of women and other at-risk groups.
Road safety has a strong equity component. Of the 1.3 million annual deaths in road traffic accidents around the world, a significant fraction occur in cities, and the vast majority happen in low-income countries. Indeed, children in low- and middle-income countries die in road-related accidents at six times the rate of those in high-income countries (Nantulya and Reich 2003). Within cities, the distribution of road traffic accidents is complex, depending on infrastructure, regulation, and enforcement, but traffic accidents are a significant cause of death and injuries in many informal settlements.

Safety and security challenges vary considerably between urban and rural areas and within and among cities; in 363 cities in Latin America, for example, the proportion of deaths due to violence between 2010 and 2016 ranged from 0 to 20 percent (Bilal et al. 2021). There are important gender dynamics to safety and security in cities. Crime, harassment, and violence toward women and sexual and gender minorities are widespread in urban public spaces. In Dhaka, Bangladesh, just fifty-seven public toilets—only five of them in good condition—serve almost 20 million people. Three-quarters do not feature separate spaces for women, generating significant safety and security risks (Kaw, Lee, and Wahba 2020). Even the perception of risk can reduce access to opportunities and services for women or other vulnerable individuals, with impacts on health and well-being. More broadly, many cities are directly affected by fragility and conflict, with severe consequences for human safety and security.

Source: Based on GHS Urban Center Database.
Access to safe water also varies greatly across and within cities, generating significant health disparities. Two-thirds of the 2.2 billion people who lack access to safely managed drinking water live in just ten developing countries, increasing their risk of waterborne diseases like cholera, dysentery, hepatitis A, and typhoid (UNICEF and WHO 2019). Globally, 86 percent of urban populations have access to safely managed drinking water but just 62 percent to safely managed sanitation (WHO and UNICEF 2021). Both developing and industrialized countries deal with complex challenges with regard to water quality; in some cases, rising incomes lead to higher levels of pollution and the introduction of new chemicals and pollutants into water sources (Damania et al. 2019). Significant intraurban inequities exist in water access and quality. In the United States, lack of access to at-home piped water in the 50 largest cities disproportionately affects people of color, immigrants, renters, and lower-income individuals (Meehan et al. 2020).

Waste that is uncollected or untreated can also pose inequitable health risks. Globally, only 71 percent of solid waste is collected; in developing countries, the amount is substantially less. Collected waste is often improperly disposed of, contributing to air, water, and soil pollution and emissions of methane and other GHGs (World Bank 2021a). The world generates 2 billion tons of municipal solid waste annually, a figure expected to grow by 73 percent by 2050, with the fastest increases in low-income countries (Ziraba, Haregu, and Mberu 2016). Informal settlements are the least likely to be reached by waste collection services, and accumulating waste contributes to flooding and other risks. Formal waste management facilities like incinerators and landfills tend to be located closer to poor or marginalized populations (Maantay 2001). In developing countries, garbage collectors are an important at-risk group composed substantially of women, older persons, and children. They require tailored solutions to safeguard health (Kaza et al. 2018), as discussed in chapter 5.
Food accessibility, affordability, quality, and safety vary significantly across cities, as do nutrition-related outcomes like stunting and obesity. Obesogenic environments and marketing in cities promote poor dietary habits, like the consumption of processed foods, while nutritious food is often inaccessible to the poor. Nutritional status differs significantly between rural and urban areas and across income levels (Skoufias, Vinha, and Sato 2019; Fagbamigbe, Kandala, and Uthman 2020; Vilar-Compte et al. 2021). Significant disparities also occur within cities. In the United States, low-income neighborhoods offer the greatest access to food sources that promote unhealthy eating (Hilmers, Hilmers, and Dave 2012). These relationships can be complex; street food, for instance, can improve food security in developing-country cities (Smit et al. 2011), but, unregulated, it can threaten health and safety (Alimi 2016).

Health care services vary in availability, quality, and affordability. Dense urban areas tend to have better access to high-quality health services than rural and sub-urban areas. Costs, too, vary among and across urban areas. In India, residents of the largest metropolitan cities spent 1.1 percent of monthly income on health between 2004 and 2005, less than a third of the 3.6 percent spent by residents of other urban areas, and far lower than the 7.7 percent and 6.8 percent, respectively, spent in developed and less-developed villages (Barik and Thorat 2015). Access to urban health care services also varies for different groups, with older persons, women and girls, migrants, refugees, the poor, and persons with disabilities often facing additional physical, financial, and social barriers to access. Proximity to and quality of health care services vary substantially, as well. In Tehran, Iran, for example, neighborhood socioeconomic status is associated with the location of hospitals and hospital beds (Chavehpour et al. 2019), and in Dhaka, residents of informal settlements have less access to health care facilities than other populations (Adams, Islam, and Ahmed 2015).
Disparities in health equity are readily visible in the distribution of health outcomes. Life expectancy is among the most straightforward measures of urban health inequity. A resident of Delhi, India, for instance, can expect to live 10 years less than a resident of Hong Kong (75.3 versus 85 years) (World Bank 2019). Differences across more homogeneous regions can be nearly as wide. A recent study that examined life expectancy in 363 Latin American cities produced values ranging from 74.4 to 82.7 years (Bilal et al. 2019). Strong differences were also seen within cities, correlated with poverty and gender. In Santiago, Chile, the life expectancy for women in the 90th income percentile was 17.7 years longer than for those in the 10th percentile; the equivalent difference for men was 10.9 years (Bilal et al. 2019).

Significant inequities are also highlighted by the rise worldwide of noncommunicable diseases. In particular, NCDs pose a more complicated threat in developing-country cities with a high burden of infectious disease and, often, of nutritional health issues, accidents, and injuries. Moreover, NCD inequities are most pronounced in urban areas (WHO Regional Office for Europe 2019). Associations between specific urban social, physical, and environmental factors and inequitable patterns of NCD risk factors and outcomes are common. According to WHO, for example, “The poorest one fifth of urban men are nearly twice as likely to smoke as the richest one fifth. Smoking is particularly high among the urban poor in Bangladesh and Indonesia, where seven in 10 and eight in 10 urban men in the poorest one fifth of households smoke” (WHO 2016a).

Health risks from air pollution are also unevenly distributed. Air pollution is among the leading global mortality risk factors (see chapter 5). Over 9 in 10 premature deaths caused by ambient pollution are in low- and middle-income countries, with the highest burden in rapidly industrializing cities of South and East Asia, sub-Saharan Africa, and the Middle East (figure 2.3). Within cities, marginalized populations experience higher risks. In the United States, for example, racial-ethnic minorities are far more exposed to PM2.5, the most unhealthy form of ambient air pollution (Tessum et al. 2021). Women and girls are often heavily affected by indoor air pollution from unclean cooking fuels, which contributes to respiratory infections, the leading cause of death for girls between the ages of 10 and 14 (WHO 2016a). Chapter 4 provides examples of managing air pollution challenges across cities.
Finally, urban health inequities are significant with respect to infectious disease, including COVID-19. A study in Barcelona, Spain, found that neighborhoods with higher density and larger proportions of older persons suffered disproportionately during the first wave of the pandemic, while those with more highly educated populations had lower rates of infection (López-Gay et al. 2021). More broadly, because social factors are strong determinants of health, infectious diseases often have a disproportionate impact on less advantaged populations (Quinn and Kumar 2014).

Urban health inequities are largely socially constructed (Prasad et al. 2018)—that is, they flow from decisions about the allocation of resources, opportunities, risks, and remedies to particular social groups. Inequities often arise from the institutional arrangements in cities and tend to persist in the absence of purposeful intervention. Informal settlements, for example, generally lack tax revenues and political representation, so existing problems tend to worsen. Many factors,

Source: The World Bank team’s analysis based on GHS Urban Center Database and IHME Global Burden of Disease.
including limited access to credit and capital, health expenditures, reduced productivity due to illness, low-quality or interrupted education, exposure to environmental risks (including weather and climate shocks), lack of security, and migrant status, among others, can combine to create poverty traps, which limit individuals’ capacity to address health risks. Gentrification may arise when improvements (public or private) increase local land values and rents, pricing out the poor and relegating them to riskier environments. The wealthy, in turn, may reduce the space available for improvements that could reduce inequity and improve urban health outcomes, like the provision of affordable housing, by opposing such construction near their homes—the so-called “not in my back yard” (NIMBY) phenomenon. The differential spatial distribution of goods and services has significant consequences for health (Diez Roux 2016).

In some cases, systemic spatial health inequities perpetuate themselves over long time frames. In the United States, mid-20th century suburbanization often involved the deterioration of urban centers where poor and disadvantaged populations were concentrated, with increasing impacts on health as local revenue and services declined. Explicit policies, such as the redlining of marginalized people of color, led to widespread racial segregation (Rothstein 2017). The impacts of these policies are still felt today; neighborhoods that were redlined “suffer not only from reduced wealth and greater poverty, but from lower life expectancy and higher incidence of chronic diseases that are risk factors for poor outcomes from COVID-19” (Richardson et al. 2020; Li and Yuan 2022). Discrimination has been linked to other long-term disease dynamics, as well. In the 19th and early 20th centuries, highly segregated U.S. cities were quicker than less segregated ones to invest in water and sewer infrastructure but, because they excluded black households, they were slower to reach universal access to these utilities and, hence, to eliminate typhoid (Beach 2022). Such issues can only be addressed by bringing to light the underlying complexity of city planning and design and their outcomes.

The existence of systemic inequities indicates that appropriate urban policies can significantly enhance health (see chapters 3 and 4 for details). While cities at different stages of industrialization, urbanization, economic development, and demographic transition will have different urban health and equity challenges, recognizing and addressing the pernicious impacts of health inequities and the ways in which they intersect with, feed upon, and amplify broader, longstanding social inequities will be crucial to achieving healthy cities in the decades to come.
2.2 Urban Health and Climate Change

The World Health Organization today acknowledges climate change as the greatest public health threat facing humanity (WHO 2021a). Yet, when the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992, the dialogue focused on protocols for GHG emissions reductions, with scant recognition of the relationship between climate change and human health (Kinney 2009). Since then, health has emerged as a central climate issue. The 2015 Paris Agreement, for example, recognizes the link between climate and health and elevates it as a key concern for climate action (WHO 2016b).8

In November 2021, the 26th Conference of the Parties to the UN Framework Convention on Climate Change (COP26) marked a sea change in the positioning of health in the climate discourse (Nature Medicine 2022). In the runup to this meeting, more than 500 organizations representing 46 million health workers signed an open letter calling on world leaders to deliver results on climate action. COP26 was the first UNFCCC conference to include a health program in the presidency portfolio and the first to feature a WHO health pavilion (Salas, Miller, and Neira 2021). More than 50 countries committed themselves to developing climate-resilient, sustainable, and low-carbon health systems; 14 also committed to meeting net zero deadlines for their health sectors by 2030–50 (Salas, Miller, and Neira 2021). Furthermore,

in the lead up to the 2021 United Nations General Assembly, editors from over 200 health journals called for swifter action on climate change, highlighting the disproportionate burden of harm that global heating (largely driven by wealthy countries) inflicts on low- and middle-income countries and on the most vulnerable members of societies. (Nature Medicine 2022)
The emergent consensus on the damaging impacts of climate change on human health and the potential co-benefits of climate action for health is driven by a wealth of evidence, including the most recent Intergovernmental Panel on Climate Change (IPCC) Assessment Report (IPCC 2022a). Under global heating, cities will experience more frequent and severe weather extremes (such as heatwaves), more hot days and warm nights, and, in many places, sea-level rise and intensified tropical cyclone storm surges and rainfall that will increase coastal city flooding (IPCC 2022a). Investments in climate adaptation and mitigation produce enormous social and environmental co-benefits, such as improvements in urban quality of life, clean air and water, social inclusion, and job creation, eventually contributing to urban health. Meeting the Paris Agreement emissions reduction commitments in just nine countries,9 for instance, could reduce deaths caused by air pollution by 1.8 million, those associated with sedentarism by 1.2 million, and those attributable to dietary issues by 5.9 million every year through 2040 (Hamilton et al. 2021).

Climate change affects health directly and indirectly along various pathways (figure 2.4):

- Storms and flooding can cause injuries, toxic exposures, contamination of water sources, loss of property and income, vector-borne disease outbreaks, and death by drowning or other means (American Public Health Association, n.d.). Increased rainfall, heat, and floods occurring together are also associated with waterborne diseases, such as cholera (IPCC 2022a).

- Extreme heat, which is increasing in frequency and intensity (see box 2.1) can cause illness resulting directly from heat (such as heatstroke), worsen chronic conditions (including cardiovascular, respiratory, and cerebrovascular disease and diabetes-related conditions), and affect mental health (GHHIN 2022). Heat events can also affect the functioning of critical infrastructure. In some cases, climate change will exacerbate weather variability, potentially leading to unusual and unpredictable cold weather events, which, for many cities, pose a greater health threat than heat (Gronlund et al. 2018).

- Changes in pathogen and vector habitats, including their expansion in previously marginal areas and emergence in new contexts, can dramatically increase populations at risk. Changing weather and land use have facilitated the spread of chikungunya, tickborne encephalitis, Rift Valley Fever, West Nile fever, Lyme disease, malaria, and dengue (IPCC 2022a). Climate-related shifts in wildlife habitat have also made more likely the emergence of zoonotic diseases, such as COVID-19 (IPCC 2022a).
• Droughts, also on the rise, can disrupt food supplies and induce water crises (Frumkin et al. 2020). Half the world’s population already faces water scarcity for at least a month annually (IPCC 2022a). Drought risk is made worse in some places by natural climate cycles. Droughts associated with the 2015–16 El Niño-Southern Oscillation, for example, may have contributed to underweight in 5.9 million children (IPCC 2022a).

• Wildfires, which will become more common as temperatures rise, weather patterns shift, and land use changes, can cause direct mortality and long-term heart and lung health issues (WHO 2021a). Wildfires kill more than 33,000 people annually (G. Chen et al. 2021).

• Sea-level rise increasingly exposes the estimated 10 percent of the global population living in low-elevation coastal zones to flooding, salinization, natural ecosystem degradation, and erosion (IPCC 2022a). It also increases the health risks associated with storms.

Finally, climate shocks can damage income and consumption, with knock-on effects for health and well-being. According to the IPCC, vulnerability to climate hazards “is higher in locations with poverty, governance challenges and limited access to basic services and resources, violent conflict and high levels of climate-sensitive livelihoods” and is “exacerbated by inequity and marginalization linked to gender, ethnicity, low income or combinations thereof . . . especially for many Indigenous Peoples and local communities” (IPCC 2022a). More frequent and severe storms and extreme weather events are also contributing to population displacement. In the first half of 2020, for example, an estimated 9.8 million people across 127 countries were internally displaced by disasters (Internal Displacement Monitoring Center 2020). The ability to cope with livelihood disruptions and loss of assets varies significantly, with poor or otherwise marginalized groups, such as women, older persons, and persons with disabilities, more likely to experience irretrievable losses.
Cities are major contributors to environmental change, including climate change. They are responsible for 60–80 percent of global energy consumption, 75 percent of carbon emissions, and more than 75 percent of natural resource consumption (UNEP 2013). Yet, by some estimates, 60 percent of the urban infrastructure needed to support global populations has yet to be built (IFC 2018). Urban emissions are not confined to those produced within city boundaries. In addition to emissions resulting from energy consumption within the city, they include emissions produced elsewhere because of urban activities (Wiedmann et al. 2021). According to the IPCC, “Cities can achieve net-zero emissions, but only if emissions are reduced within and outside of their administrative boundaries through supply chains, which will have beneficial cascading effects across other sectors” (IPCC 2022b). Rapid, unplanned urbanization—or, equally, car-centric planning—puts even more pressure on the environment, as urban sprawl and a decline in open and green spaces result in higher emissions (McMichael 2000; see also chapter 3, below).
Box 2.1. Health Impacts of Extreme Heat

The increase in ill health associated with a rise in the number and intensity of extreme heatwaves is a key example of the health impacts of climate change. Estimating global heat exposure is challenging, especially in developing-country cities where data are scarce, but by some estimates, urban extreme heat exposure grew by nearly 200 percent from 1983 to 2016 (Tuholske et al. 2021). Some 30 percent of the global population is exposed to deadly temperatures for at least 20 days a year, a figure that will reach 48 percent by 2100, even assuming major efforts are made to reduce greenhouse gas emissions (and will be much higher without such efforts) (Mora et al. 2017). These global figures translate to significant local health impacts. In China, the difference between 1.5°C and 2°C of warming is an estimated 28,000 additional heat-related deaths each year (Y. Wang et al. 2019).

Heat is especially problematic in cities because of the urban heat island effect. Urban temperatures are higher than those of surrounding areas, largely because of the replacement of natural land cover by impermeable urban surfaces (Ziter et al. 2019). City temperatures can be as much as 10°C hotter than in surrounding areas, substantially increasing heat risks for urban populations (Hoffman, Shandas, and Pendleton 2020).

Urban heat disproportionately affects lower-income communities and marginalized populations. In New York, heatwave deaths have been found to be more common among black individuals and in neighborhoods with low incomes and less green space (Madrigano et al. 2015). In Portland, Oregon, during a 2014 heatwave, census blocks hosting communities of color and low-income communities were exposed to greater heat than other areas (Voelkel et al. 2018). In the Netherlands, non-Western migrants were the subgroup most exposed to high temperatures (Mashhoodi 2021).

Many of the health impacts of climate change are amplified in cities (IPCC 2021). Many of the world’s largest, most productive cities, for instance, are along waterways subject to flooding. In 2000, low-elevation coastal zones comprised just 2.3 percent of the land area of coastal countries but held 10.9 percent of their populations; 83 percent of such populations were in developing countries (Neumann et al. 2015). The number of people living in low-elevation coastal zones is projected to increase significantly in coming decades, particularly in Africa and Asia (Neumann et al. 2015). The relationship between flooding and urbanization is complex, but urban population growth will, in many places, exacerbate flooding risk, as it typically involves an increase in impervious surface area and changes to the natural ecosystem (Dodman et al. 2022). Urbanization in Indonesia, for example, may increase the risk of river and coastal flooding by 76 to 120 percent (IPCC 2022a). Health risks from storms and flooding are higher in the developing world. Between 1995 and 2015, 89 percent of storm-related deaths occurred in low-income countries, which accounted for just 26 percent of storms (Revi et al. 2014).
Compounded climate risks are detrimental to urban health by increasing vulnerability, exacerbating grievances, and deepening preexisting fragility. In Eastern Africa, cities have simultaneously experienced extreme high temperatures, heavy precipitation, and drought (IPCC 2021). Inadequate urban planning can amplify climate-related health risks for urban dwellers by increasing their vulnerability and/or exposure. The various impacts of informal settlements on health and household resources and the lack of basic services can diminish resilience to climate hazards. Because such settlements often arise in less desirable, more precarious, and hazard-prone areas, residents are also more vulnerable to flooding, landslides, storms, air pollution, and water scarcity, among others (Satterthwaite et al. 2020).

The health impacts of climate change disproportionately affect developing-world cities and marginalized population groups. In Tehran, for example, those especially at risk from urban heat island effects include children, the elderly, people with chronic illness, those who live in areas with poor air quality and who work or spend time outside, and those who take certain medications (Shahmohamadi et al. 2011). As with most issues, climate change imposes elevated risks on the urban poor and racial minorities. The poor are more likely to live in informal and insecure housing at increased risk of flooding and landslides in, among others, Sao Paulo, Brazil; Jakarta, Indonesia; Mexico City, Mexico; and Dar es Salaam, Tanzania (Baker 2012).

Cities bear significant financial exposure with respect to extreme weather- and disaster-related losses, which are expected to reach US$415 billion per year by 2030 (UNISDR 2015). This will be a significant drain on public investment, particularly in developing countries. By some estimates, climate change will push an additional 100 million urban residents into poverty by 2030 (World Bank Group 2016). Delay in climate action and investments will make dire health and social consequences even worse.

Addressing climate crises and promoting urban health are parallel initiatives. Many of the options available for climate change mitigation and adaptation also provide co-benefits for urban health, the harnessing of which has become a central concern in the global climate discourse and the sustainable development agenda. In 2021, the World Bank announced its new Climate Change Action Plan 2021–2025, which includes cities as one of five key systems for transformation. The plan proposes to help cities decarbonize and build resilience by improving urban air quality and promoting green and resource-efficient buildings and infrastructure, actions that also enhance urban health. Similarly, WHO’s COP26 Special Report on Climate Change and Health calls for a reimagination of urban environments, promoting “sustainable, healthy urban design and transport systems, with improved land-use, access to green and blue public space, and
priority for walking, cycling and public transport,” as one of ten recommendations for prioritizing health and equity in the climate agenda (WHO 2021a).

Between 2020 to 2030—the “Decade of Action,” so called by the UN—efforts to achieve sustainable development will need be ramped up. Climate change is a critically urgent issue, because failing to rein in and drastically reduce emissions by 2030 will cause irreversible damage to the global environment. Over the years to come, integrating healthy city actions with the escalating climate effort while also navigating the constraints that effort implies will prove crucial.

2.3 Moving beyond COVID-19 toward a Healthier Future

COVID-19 has highlighted the vital role cities play in ensuring urban resilience and social cohesion in the face of disasters (de Leeuw 2020). The pandemic has tested local capacity, emergency systems, and governance, and, as with past health crises, it has instigated a reconsideration of the form and function of cities.

With high population densities, contact rates and a prominent role in global transportation networks, cities have been epicenters of the pandemic since its inception. Over 95 percent of early cases occurred in urban areas (Bhalla 2020), with rural transmission soon following. Models suggest that cities acted as global gateways for infection, seeding local outbreaks (da Silva Corrêa and Perl 2022). The cities most affected were those with ill-managed density, underdeveloped or nonexistent emergency response systems, poorly developed public services, and inadequate health care systems, all of which contributed to excess mortality and morbidity (Lall and Wahba 2021). Some studies, for example, found that high air pollution levels and inadequate access to clean water and sanitation were associated with more cases and more deaths (Sachs et al. 2020; Contini and Costabile 2020; Fattorini and Regoli 2020).

If there is a silver lining to COVID-19, it is that cities have an opportunity, unimagined a few years ago, to build back better, reinventing themselves to enhance prevention, preparedness, and response for future health crises (Sagan et al. 2021; UN-Habitat 2021). This section briefly reviews key areas in which city and collective pandemic responses have raised issues that have implications for long-term healthy urban transformations.
IMMEDIATE URBAN RESPONSES TO THE PANDEMIC AND THEIR TRADEOFFS

In the absence of effective treatment early in the pandemic, cities implemented a range of nonpharmaceutical interventions (NPIs) to limit COVID-19 transmission, sometimes enforcing national policies and sometimes implementing their own (CIDOB 2020). Among these interventions were activity limitations, including lockdowns; restrictions on public and private gatherings; restrictions on or closures of schools, businesses, public spaces, and places of worship; social bubbles; travel restrictions; and isolation and quarantine. Other NPIs included face mask mandates; physical distancing measures (such as increased spacing of seating and designated pathways in retail areas); respiratory and hand hygiene; and environmental cleaning (ECDC 2020). In some cases, NPIs were voluntary while in others they were strictly enforced by public authorities. While the salience of the interventions themselves may have been limited beyond the end of the pandemic, they had, in some cases, effects or raised issues that will have long-reaching impacts on healthy city action.

Activity restrictions, ranging from restrictions on public and private gatherings to full societal lockdowns, were a near-universal feature of COVID-19 response. The adoption and enforcement of such measures depended not only on disease incidence or prevalence, but on economic considerations, juxtaposed with risk tolerance and norms about personal rights versus societal protection—their own evolving in many contexts. Activity restrictions had significant socioeconomic consequences for cities. In countries in Africa, for example, urban sectors, which account for 64 percent of GDP, were hit hard, with substantial losses of productive jobs (UN-HABITAT 2020b). In Indonesia, 98 percent of micro, small, and medium enterprises saw revenues fall during the pandemic, with 45 percent shedding employees (Shinozaki and Rao 2021).

The pandemic also created lasting health challenges beyond acute infection, including chronic disease and mental health issues arising from social distancing, isolation, and quarantine (Brooks et al. 2020; Rossi et al. 2020; Simon et al. 2021). In many contexts, the deep psychological impacts included depression, post-traumatic stress symptoms, and generalized anxiety, among others, as a consequence of stressful work situations or unemployment; fear or experience of illness, bereavement, or isolation as a result of pandemic response; or other factors. Older persons, at high risk of severe illness, were especially affected by social isolation and ensuing mental health challenges (Wu 2020). How such issues have continued to evolve is unclear, but they have added new complexities for healthy city action. Likewise, many who have survived COVID-19 experience chronic symptoms—or “long COVID.” Among over a quarter of a million patients in one study (largely in the United States), 57 percent had at
least one of nine symptoms of long COVID, which include fatigue and respiratory and neurocognitive deficits (Taquet et al. 2021). The long-term persistence and prognosis for long COVID is unknown, but the syndrome constitutes an ongoing health burden in cities and may plausibly be a comorbidity that will exacerbate other urban health challenges.

COVID-19 disproportionately affected the urban poor and informal workers, whose lower adaptive capacity, fewer resources, and limited access to infrastructure and services reduced their ability to comply with social distancing and other NPIs. The World Bank estimates that the pandemic pushed 97 million individuals into extreme poverty in 2021 (Mahler et al. 2021). As a result, residents of informal settlements in particular were subject to disproportionate risks of, for example, being forced to share facilities like public bathrooms and community kitchens, which rendered social distancing extremely challenging and made disease transmission more likely (Bhardwaj et al. 2020). They also often worked in the informal sector, leaving them vulnerable to job loss and with limited social protection. These impacts on the poor and vulnerable will continue to complicate healthy city efforts in the near term.

Activity restrictions also had a transformative impact on the use of urban space and people’s perception of urban lifestyles. Fundamental tenets of urban planning were called into question as central business districts and office buildings sat vacant. Ramani and Bloom (2021) have described a “donut effect,” with activity shifting outward to suburban peripheries in U.S. cities. Many businesses reconsidered working arrangements, and long-term impacts on demand for office space remain an open question. These changes sparked and continue to fuel debates around what living and working arrangements should look like in future cities and how to make urban density healthier and more livable.
Another change brought about by the pandemic was the dramatic shift toward active mobility, such as walking and cycling, prompted by the health risks associated with crowded transportation. Transit ridership plummeted, and thousands of cities responded with investments in new infrastructure or other accommodations for nonmotorized transportation. In Auckland, New Zealand, for example, extra footpaths were added to permit two-meter physical distancing, while Bogota, Colombia, created 84 kilometers of temporary bicycle lanes (Orsman 2020; WHO 2020b; Goetsch and Peralta Quiros 2020). Paris, France, leveraged this momentum to institute new cycling-supportive policies, aiming to become 100 percent cyclable by 2026 (Kraus and Koch 2021).

Changed ideas about city life and the best use of urban space may prove among the most durable sequelae of the pandemic and those with the greatest impact, as cities adjust to accommodate rebalanced relationships between businesses and workers, transformed mobility patterns, and new loci of business and social activity.

**REVISITING HEALTH SYSTEMS IN CITIES**

On a broader scale, COVID-19 has underscored the ill-preparedness of governments worldwide to deal with health crises. Cities with direct experience of prior outbreaks of SARS and H1N1, including Beijing and Hong Kong in China; Seoul, Korea; and Singapore, had greater success in dealing with COVID-19 during the earlier stages of the pandemic, having strengthened their health systems in anticipation of future challenges; yet even these cities have struggled with the most transmissible variants (Bai et al. 2020; S. Y. S. Wong et al. 2021) (see box 2.2, below). Other global infectious disease outbreaks, including HIV, Zika, and Ebola, have also informed approaches to COVID-19 (Impouma et al. 2021; ten Have 2021). Pre-pandemic evaluations of crisis readiness, like the highly regarded Global Health Security Index (GHSI), were not predictive of actual performance (Abbey et al. 2020). This has called into question our ability to measure or plan for preparedness. While the pandemic has brought significant learning, an update to the GHSI finds that “all countries remain dangerously unprepared for meeting future epidemic and pandemic threats,” having broadly failed to make needed investments in institutions, anticipatory planning (including early warning systems and infectious disease surveillance), financing, equity, or capacity for data gathering and response (Bell and Nuzzo 2021).

Moreover, incomplete and inequitable vaccine coverage—especially among the masses of unvaccinated in low- and middle-income countries—has increased the likelihood that the pandemic will persist and that new, potentially dangerous variants will emerge. Likewise, waning immunity and the inability of vaccines to block transmission completely suggest COVID-19 will remain a concern and a significant factor in healthy city action for years to come.
Box 2.2. Lessons Learned from Past Pandemics in the Republic of Korea

The H1N1 epidemic in 2009–10 and the MERS outbreak in 2015 in the Republic of Korea led to public investments in emergency response. One example was the amendment of the Infectious Disease Prevention and Control Act to permit the collection and sharing of personal information, with the goal of preventing or containing infectious diseases. While the technological tools applied in response to the outbreak of COVID-19 are widely available in highly digital societies, the social and political willingness to access and analyze that information set Korea apart.

At the onset of the COVID-19 pandemic, the Korea Disease Control and Prevention Agency (KCDA) established rapid response teams to conduct contact tracing upon identification of positive cases. Juxtaposing data from multiple sources in an existing data management system, these teams identified and informed actual or potential contacts of the active cases. Initially, the results of investigations were made public, raising obvious concerns regarding the right to privacy; eventually, individually identifiable information was removed from public reporting.

The government also created a “Self-Quarantine Safety Protection App” to help individuals track their symptoms, to monitor their movement and compliance with quarantine restrictions, and to allow them to contact health care professionals, if needed.

While Korea’s many successes in using technology to mitigate the impacts and spread of COVID-19 have drawn upon data that are typically available in highly digitized countries, the country’s unique mandate and legal framework that allow it to utilize those personal data have separated it from most others. A balanced approach to using data to contain transmission while also safeguarding personal rights and privacy is important. Korea’s experience provides lessons on both.


Although vaccines are typically sourced at the national level, cities are often in the driver’s seat when it comes to distribution. Cities have deployed a host of innovations to encourage and facilitate vaccination. In Stuttgart, Germany, for example, mobile vaccination teams were deployed to bring the vaccine to residential areas, nursery homes, and care facilities (Eurocities 2021). Other cities have partnered with transportation businesses to facilitate access to vaccination sites (Chappell 2021). Nevertheless, inequities continue even within cities—in the United States, minority vaccination rates have persistently trailed rates among whites, and the poor everywhere are least likely to be vaccinated (Murthy et al. 2021; Sun and Monnat 2021).

City communication and community outreach strategies have also played a crucial role in effectively managing conflicting views around vaccine mandates and deepened societal divisions during the pandemic. Vaccines have, in some places, become political flashpoints, at the expense of public health and well-being (Sharfstein et al. 2021; Sun and Monnat 2021). Common reasons for vaccine hesitancy include misperceptions of death rates related to COVID-19 and concerns over the speed with which the vaccines were developed and their potential long-term effects (L. P. Wong et al. 2021). Political maneuvering and group
identity are also among the major factors that affect the public’s perception of the vaccine. Some cities have effectively used innovative approaches to manage such conflicts and challenges by, for instance, establishing dedicated websites, dashboards, and integrated databases to make reliable and timely information about the pandemic available to citizens (United Nations 2020).

The pandemic has also underlined the interdependencies among health systems, emergency response agencies, and infrastructure systems in managing shocks like pandemics or disasters. Emerging telemedicine, for instance, depends on reliable access to telecommunications, energy, and data. During disasters, disrupted transportation, electricity, and clean water supplies hinder the delivery of essential care. During the pandemic, many cities, especially in the developing world, found their health systems unprepared and overwhelmed (Sagan et al. 2021; UN-Habitat 2021), grappling with shortages of medical staff, health care supplies, and hospital beds. The strain the pandemic has placed on health care systems worldwide has also hindered their ability to provide adequate treatment for other diseases. A study of Medicare admissions to 4,626 U.S. hospitals, for example, showed a significant decrease in admissions of patients for non-COVID-19 diagnoses, beginning in March and April 2020 and persisting at least through September 2021 (Dang et al. 2022). Increases in mortality were greater in hospitals with high caseloads of COVID-19. To alleviate capacity overload in health facilities during peak outbreaks, cities often repurposed underutilized urban facilities, such as community and cultural centers, as temporary hospitals to accommodate multiple beds and absorb the surplus of patients (Candel et al. 2021). Cities are now considering how to integrate such potential assets into their health systems to be better prepared for future crises.

Cities have represented the vanguard of COVID-19 response from the start. While most have endured devastating loss of life, cities everywhere have adapted to improve conditions for urban residents. In the wake of the pandemic, cities have an opportunity to build on progress, leveraging advancements in digital technology and new visions of the city to build back better, ensuring better health for people and the ecosystems on which they depend. Achieving healthy cities, however, will depend on the extent to which the lessons from COVID-19 are learned and applied to coping with future health crises, including those arising from climate change—which may, indeed, include new pandemics (Beyer, Manica, and Mora 2021).
**ENDNOTES**

1. “Equity” and “equality” are at times used interchangeably, but they have different meanings and implications (Global Health Europe 2009). Health equality (or inequality) refers to the equal (or differential) distribution of outcomes or resources among a set of individuals or groups. Equity (or inequity), in contrast, refers to the absence (or presence) of “systematic, unfair, avoidable or remedial inequalities in health between groups of people, whether these groups are defined socially, economically, geographically or demographically” (WHO 2015). Inequalities are often indicators of underlying social, economic, geographic, or demographic inequities. In this report, we generally use the term equity, as representative of differences in health outcomes arising from situations within which concrete actions can produce more equality.

2. In 2020, a UK court recognized air pollution as a contributing factor in the death of a child, nine-year-old Ella Kissi-Debrah (Jazrawi 2020), while a Dutch court ruled that the Royal Dutch Shell oil company had an obligation to reduce CO₂ emissions. These two landmark cases opened the door to legal redress of environmental equity issues.

3. Half a million people a year die of violent crimes globally.

4. This situation has also led to increased levels of urinary tract infections in women who postpone urination rather than using unsafe public facilities.

5. In 2015, 74 percent of deaths resulted from just four NCDs: cardiovascular disease, cancers, diabetes, and chronic respiratory disease. Of those, 85 percent occurred in low- and middle-income countries (MH 2016).


7. “Redlining” was the practice, now illegal, of drawing boundaries (or red lines) around neighborhoods where minorities were excluded from buying housing through discriminatory mortgage lending.

8. The statement includes the following: “Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on . . . the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations” (UNFCCC 2016). The Conference’s decision also recognizes “the social, economic and environmental value of voluntary mitigation actions and their co-benefits for adaptation, health and sustainable development.”

9. Brazil, China, Germany, India, Indonesia, Nigeria, South Africa, the United Kingdom, and the United States.

10. Rural areas often experienced worse outcomes than cities, likely due to their having higher shares of older residents, a higher prevalence of comorbidities, and lower capacities and resources for pandemic management (OECD 2020; Peters 2020).

11. Some major cities subsequently doubled down on pandemic transportation changes: in September 2021, Berlin announced a massive expansion of its cycling network, to 3,000 kilometers (Johnson 2021a), and in October, Paris announced it would spend $250 million over the next five years to become a 100 percent cycling city (Johnson 2021b).

12. Vaccine distribution mechanisms to address such challenges have included COVAX, which pools global resources in an effort to provide fair and equitable access. It is co-led by the Coalition for Epidemic Preparedness Innovations (CEPI), Gavi: The Vaccine Alliance, and WHO and supported by the World Bank and other multilateral development banks.

13. In some contexts, mask mandates engendered similar complexities and conflict.
Healthy Cities

Healthy Cities in Action: Maximizing Health Co-Benefits of Sustainable, Inclusive, and Resilient Urban Investments

This chapter surveys in the context of the TIP framework presented above some of the most important thematic areas for integrated healthy city action plans. Four areas are covered: (1) healthy urban spaces, including housing and buildings, public spaces, and urban transportation; (2) water, sanitation, and waste; (3) healthy urban food systems; and (4) health service provision in cities. We discuss these clusters of urban actions with a focus on how they can provide targeted support to the most vulnerable, integrate approaches across sectors and scales, and enhance preparedness for future health crises.1

3.1 Healthy, Low-Carbon Urban Spaces

Health is profoundly affected by the quality of the spaces in which people live, work, and socialize and by the environments they encounter as they move among these spaces, which include houses and other buildings, green and open (public and private) spaces, and transportation systems, among others. How these areas are designed, managed, and maintained have significant impacts on ecosystem and human health.

BUILDINGS AND HOUSING

In healthy cities, buildings provide safe environments, with conditions compatible with healthy living and working. They protect against climate hazards, including extreme weather, geological events, flooding, disease vectors, and pollution. They are constructed using safe, nonhazardous materials, with adequate insulation and ventilation, and are well connected to critical utilities, such as water, sanitation, electricity, and information and communications technology (ICT). They are environmentally friendly, limiting ecological impacts of construction and minimizing energy use and emissions over the entire life cycle of the buildings. They provide easy access to nature, social and recreational activities, and physical exercise. They are regularly maintained, are not subject to overcrowding or other dangerous usage, and provide security of tenure without fear of eviction.
Unfortunately, a substantial fraction of housing and other buildings in most cities worldwide do not live up to these standards. Housing often exposes residents to epidemiological, social, and climate risks as a result of poor siting, materials, maintenance, usage, and/or connections to critical infrastructure—especially in low-income informal settlements, but even in high-income settings (WHO 2018) (see chapter 2 for more information). Significant health gains can result from even modest improvements to housing (Butler and Maguire 2022). In Mexico, simply substituting cement for dirt floors reduced parasitic infections and anemia in young children by about 80 percent and diarrhea by half and improved cognitive development by as much as 96 percent; it also increased adults’ life satisfaction and mental health (Cattaneo et al. 2007). In Australia, where the Housing for Health program has worked with indigenous communities across the country to inspect, repair, and improve existing housing, hospitalization rates in participating communities have been reduced by 40 percent (Standen et al. 2020).

Most countries also have a significant shortfall of affordable housing. In Nigeria, for example, an estimated 17 million housing units are needed to fill the current backlog and keep up with projected urbanization (Gavin 2020). This shortage can threaten health by increasing homelessness and overcrowding and raising social tensions. Globally, over 20 percent of the world’s population—1.6 billion people—lack adequate housing, a number that may rise to 3 billion by 2030 (World Bank 2020d).

Healthy cities can improve the quality, availability, and affordability of healthy housing and buildings in various ways. Building codes, standards, and regulations are considered key determinants of human health. Zuraimi and Tan (2015), for example, found that in Toronto, Canada, exposure to outdoor PM2.5 could be reduced and citywide health care costs saved by compliance with building code regulations pertaining to the use of mechanical HVAC systems, improved filtration, and a tighter building envelope.

The building code development process often fails to meet the urgency or scope of health issues, however. The unregulated use of toxic materials in housing and school buildings, for instance, has long been recognized to increase the risk of childhood lead poisoning, adversely affecting cognitive and physical health. In the early 1990s in the United States, the Centers for Disease Control launched a 20-year strategic plan to control lead hazards in housing, and the Residential Lead-Based Paint Hazard Reduction Act of 1992 was enacted as part of the Housing and Community Development Act of 1992. Despite this substantial effort—and related legislation to remove lead from gasoline and other sources—lead poisoning remains a threat for children in the United States, especially
in poorer communities. More than half of all U.S. children still have detectable blood lead levels, a result that tends to be unequally distributed across racial and socioeconomic groups (Whitehead and Buchanan 2019; Hauptman et al. 2021).2

Recent years have also seen a proliferation of green building standards and certification systems. These include Leadership in Energy and Environmental Design (LEED) and Excellence in Design for Greater Efficiencies (EDGE). Newer standards specifically address health; the WELL Building Standard, for example, is “a performance-based system for measuring, certifying, and monitoring features of the built environment that impact human health and wellbeing, through air, water, nourishment, light, fitness, comfort, and mind” (Knox 2015). Allen et al. (2015) stress that green buildings have better indoor environmental quality, including lower levels of volatile organic compounds, formaldehyde, allergens, environmental tobacco smoke, nitrogen dioxide, and PM—all linked to adverse health effects—and they thus offer direct health benefits to occupants.

Neighborhood-level standards, zoning, plans, or regulation can also help ensure that residential and other buildings form part of a cohesive community. They can improve the spatial relationships among urban elements by, for example, segregating environmental hazards from—or mandating parks or other features in—residential areas. A new standard for Sustainable Development in Communities from the International Organization for Standardization (ISO) seeks, among other things, to “improve the local environment, create a happier and healthier place for citizens, and build a community that can better anticipate and adapt to natural disasters, economic shocks and climate change” (Tranchard 2016). Car-centric zoning practice, on the other hand, can adversely affect health. In the United States, low-density residential zoning has been seen to raise costs, limit housing
supply, and restrict the development of low-cost, multifamily housing and of mixed-use areas, exacerbating equity and environmental issues alike (Lens 2021).

Capital subsidies for affordable housing construction can come from a variety of federal, state, or local sources and can lower costs associated with developing a property for rental or sale, thus reducing housing costs to potential residents, which in turn can reduce homelessness and overcrowding and free up funds for other expenses, like food or medication (Taylor 2018). Subsidies can also be applied to environmental housing improvements, and governments can subsidize individuals by, for example, providing housing vouchers that afford them greater choice over where to live. To address complex challenges, housing solutions need to be tailored to local contexts. The World Bank report, Stocktaking of the Housing Sector in Sub-Saharan Africa: Challenges and Opportunities (World Bank Group 2015), highlights the way in which investment in formal housing lags urbanization and the underinvestment in infrastructure that generates unhealthy housing in informal settlements in the region.3

Poor housing in informal settlements is a persistent challenge. Both a symptom and a cause of urban poverty, it has significant impacts on health and health equity. The progressive efforts by the city of Kigali, Rwanda, to tackle this issue highlight key challenges and opportunities (see box 3.1).

In addition to government-led efforts for settlement upgrading at scale, programs that foster incremental improvements by the property owners themselves or leverage cost-sharing schemes between the government and individual households offer alternative approaches that can be financially sustainable while producing substantial health benefits. In Indonesia, the Self-Help Housing Stimulus (BSPS) has supported more than 1 million4 incremental self-built housing projects in rural and urban periphery areas since it started in 2006, with homeowners contributing their resources on top of the subsidy for renovation or new construction. As of 2022, Rwanda-based Earth Enable had installed around 376,080 square meters of hard floors coated with an antipathogen finish in 14,987 Rwandan and Ugandan houses (Earth Enable 2023). Incremental additions can add to the urban housing stock and reduce indoor overcrowding. Government-subsidized loans to property owners to increase the number of floors and rooms in their housing units, especially in one-story houses close to city centers, can be especially cost effective, as they promote densification (Bower and Buckley 2020).
Box 3.1. Improving Healthy Housing for the Urban Poor in Kigali

Kigali’s early efforts between around 2000 and 2015 to upgrade informal settlements focused on expropriation and in-cash compensation for settlement dwellers (Uwayezu and de Vries 2020). This resulted in spatial injustice, as displaced residents were forced to relocate to urban fringes, where they could afford new dwellings but lacked access to amenities, opportunities, and, critically, urban services, such as adequate water, sanitation, and roads. A more recent approach has involved allocating dwellings in planned urban neighborhoods to displaced residents. This, too, has courted controversy and sparked opposition from many informal settlement dwellers (Esmail and Corburn 2020).

More promising have been efforts to carry out upgrading in situ. This approach provides beneficiaries with higher-quality dwellings and services without compromising income-generating opportunities and without subjecting them to the social upheaval of displacement. In situ upgrades of informal settlements have generally been spearheaded by the City of Kigali’s Ministry of Infrastructure and by development partners like the World Bank. Since 2018, the city has played an increasingly prominent role in identifying areas for redevelopment and improvement, seeking to convene relevant interest groups and actors.

In situ approaches have taken various forms:

- Improvements in public infrastructure, such as stormwater drains, streetlights, and road quality improvements (World Bank 2020c). These are funded mainly by multilateral development partners and coordinated and managed by the City of Kigali and government ministries.

- Construction of new mixed-income, mixed-use developments by private sector real estate developers. Although still in development, the government-backed Kigali Green City project exemplifies this approach, including a proposed upgrading scheme that will improve the quality of life for 1,700 low-income households by, for example, improving housing and access to water and sanitation, while also improving adjacent areas for higher-income residents. Although the scheme will largely be paid for by an external funder, the proposal seeks to implement innovative policies to ensure financial sustainability, including land value capture to ensure some of the economic benefits accruing to landlords are recovered by the project for further infrastructure upgrades and improvements.

- Upgrading of low-quality housing through land readjustment (Amirtahmasebi et al. 2016) and onsite redevelopment. A pilot project has involved working with landlords to remove low-quality dwellings and create new multistory residential buildings on the same designated plots. This activity has numerous potential health benefits:
  - Dwellings are of higher quality, with nonporous floors and roofs and improved ventilation.
  - Land freed up by the multistory construction can be used for income-generating or otherwise beneficial activities, including small businesses, restaurants, and so on.
  - Densification allows space for construction of critical utility infrastructure, such as communal septic tanks, rooftop tanks, high-quality water piping, and solid waste tipping facilities that benefit not only participants but residents of surrounding areas.
  - Partnership with community members preserves socioeconomic networks and fosters a harmonious social environment that directly and indirectly contributes to better public health.


b. Interview with Mark Warren and Nathalie Neema, Green City Kigali Team leads, April 6, 2021.

c. Led by Skat Consulting’s PROECCO program in partnership with the city.
URBAN PUBLIC SPACE

The quality of urban public space has important health impacts. Functionally, some spaces, like those occupied by parks, libraries, or markets, stand alone as areas dedicated to specific social uses, but the urban fabric through which people travel to get from one place to another—comprising of roads and roadsides, transportation infrastructure, and so on—is also an important element of public space. Well-designed public spaces, such as parks and urban forests, can remediate or protect against floods, air pollution, heatwaves, and other climate hazards while encouraging physical activities on the part of residents and reducing the prevalence of health issues, like diabetes and obesity (WHO 2016a).

The specific characteristics of healthy public spaces vary considerably with local cultural and environmental factors and intended use, but generally the spaces need to be accessible, attractive, safe in terms of both health and climate risks, and well-maintained (Koohsari et al. 2015). High-quality public spaces contribute to a sense of community and, thus, to the social capital that underpins effective government action for health (Francis et al. 2012).

Conversely, poorly maintained or unsafe public spaces can undermine community and contribute to poor health. Moreover, public spaces ignored in the press of rapid urbanization, poor planning, and financial constraints can become liabilities that drain public resources and cause other urban problems (Kaw, Lee, and Wahba 2020). Clean, safe public spaces are particularly important for vulnerable groups. Refugees and other displaced persons, for example, are often subject to additional environmental health risks, especially those associated with degraded urban spaces within and around refugee camps (Thomas and Thomas 2004; Obi 2021).

Programs to rehabilitate underutilized public spaces or create new ones represent some of the most visible and successful healthy city initiatives worldwide. In Singapore, the Park Connector Network, comprising pedestrian pathways and cycling lanes along stormwater canals, roads, and viaducts that connect neighborhoods across the island state, has become a major attraction and a green corridor, benefiting biodiversity, physical and mental health, and the local economy (Kaw, Lee, and Wahba 2020). In Bangladesh, the Dhaka City Neighborhood Upgrading Project, with a budget of US$100 million, seeks to enhance the livability of selected neighborhoods by improving existing public spaces, such as parks, waterfronts, streets, and community centers. It caters to the needs of women, youth, elderly, and disabled residents, who often refrain from using public amenities (World Bank 2019).

Micro-regeneration of small public spaces also offers considerable potential for improving human and environmental health. The Kilu New Village community
Healthy Cities

park in Shanghai, China, was upgraded using a health-centered approach that included an assessment of the site’s physical, environmental, and social features, interviews with residents, health-informed design decisions, and health impact assessments. Its three design priorities were reducing exposure to pollution, providing accessible health facilities, and promoting physical activity and social interactions. Following the improvements, use of the park increased by 40 percent (L. Wang et al. 2020).

Green and blue spaces fall under the broader rubric of nature-based solutions (NBSs), which are “approaches that use nature and natural processes for delivering infrastructure, services, and integrative solutions to meet the rising challenge of urban resilience” (World Bank 2021b). NBSs span a wide range of scales, from individual buildings (with, for example, green walls or roofs) to corridors along streets or other linear features, to individual urban parks, water bodies, and forests. They even extend beyond urban boundaries to the ecosystems that shelter cities from storms or provide drinking water (World Bank 2021b). The suitability and scalability of particular NBSs vary with the biophysical and climatic environment of the city (figure 3.1) (Cortinovis et al. 2022). The future of dry cities, for instance (or cities projected to face dry futures), will depend on how they balance the shade value of trees with the availability of water for irrigation (Frumkin et al. 2020).

The pace of urbanization and densification, along with privatization and the partitioning of public lands, has led to a decline in green space in cities worldwide (Colding, Gren, and Barthel 2020; Kaw, Lee, and Wahba 2020). Recognizing

**Figure 3.1. Different Types of Urban Assets for Nature-Based Solutions**

the manifold benefits of high-quality green spaces, cities in developed and developing countries alike are introducing urban greening strategies. The Draft Structural Plan for Dhaka 2016–2035, for example, includes the creation of an intraurban green network, development of a green belt near urban water bodies, and forestry and greening of the city core and periphery, as well as the preservation of open space for livability (RAJUK 2015). In 2021, the World Bank published *The Primer for Cool Cities*, which provides a range of greening solutions to address the health impacts of excessive urban heat and other manifestations of climate change (Energy Sector Management Assistance Program 2020). An increasing number of investments at the World Bank are focused on leveraging at-risk or undervalued natural assets within cities to improve health and well-being (see box 3.2).

**Box 3.2. Utilizing Environmental Assets to Enhance Health and Well Being**

The World Bank has undertaken an increasing number of investment projects to transform at-risk or undervalued city assets into green, inclusive, competitive, and resilient places. Among these interventions have been the following:

- In Colombo, Sri Lanka, the Metro Colombo Urban Development Project sought to transform the Beddagana wetlands, an undervalued ecological asset, into a high-quality space for recreational and educational activity. Since completion in 2015, the new Beddagana Wetland Park has seen extensive use, especially by youth and families. Beyond their essential role in flood mitigation—232,000 people are directly protected—the wetlands regulate extreme air temperatures, making the city more livable. Total annual benefits, including flood protection, are valued at SL Rs 12 billion (US$66 million).

- In Dar es Salaam, Tanzania, the Msimbazi river basin, which covers an area of 271 square kilometers and is home to nearly a third of the population of one of Africa’s fastest growing cities, is exposed to seasonal flood risks. In 2018, the city initiated a participatory planning process to address this issue pragmatically. The resulting Msimbazi Opportunity Plan envisaged turning the flood hazard area into a vibrant city park, surrounded by prime real estate for urban development. Working with detailed flood simulations and analytics, planners established three design priorities: conveyances to swiftly drain river water to the ocean; elevated terraces to channel water and guard against flooding; and a city park to make functional use of terraces and flood plains.

- Beira, Mozambique, is among the world cities most threatened by climate change. Through its Cities and Climate Change Project, the World Bank coordinated with the Municipality of Beira to improve the capacity of the Chiveve River to mitigate floods. The first phase of the project included rehabilitation of the riverbed, construction of a controlled tidal outlet, dredging of the fishing port, and the planting of 2,200 mangrove trees to actively mitigate flooding. The second phase, in progress, focuses on developing a multipurpose green space with a park, cycling paths, and other amenities along a stretch of the river in the city. These actions have transformed the river into a green urban park that offers ecosystem services, such as biodiversity, drainage, urban cooling, and flood mitigation, as well as economic and recreational opportunities.

NBSs on the urban periphery can also be important to health. Green belts can contribute to cooling city cores (Gunawardena, Wells, and Kershaw 2017) and can constitute a physical barrier to urban sprawl. The city of Tirana, Albania, for example, is working with ARUP and the European Bank for Reconstruction and Development to plan an “orbital forest” around the city. Intended to comprise 2 million trees, this is a “nature-based solution that is intended to put a brake on urban sprawl, reconnect the citizens with nature, clean the air, address urban heat effects, and is just one part of a wider plan for the city’s future” (ARUP 2018). Easily accessible peripheral green parks or natural areas can likewise be a resource for physical recreation, mental recharge, and exposure to nature for city dwellers.

**URBAN TRANSPORTATION**

Healthy mobility is among the most important elements of a broader healthy city approach. Transportation affects human health through exposures inherent in the transit process to stress, noise, safety issues, road traffic accidents, pollutants, violence, and harassment; through its environmental impacts, such as emissions of toxic pollutants and greenhouse gases; and through its influences on social and economic behavior and consequent urban development.

Private automobiles, at the core of transportation planning for most cities worldwide, are notoriously inefficient; cars are parked more than 90 percent of the time and usually operated at significantly less than peak capacity. Roads, too, reach peak capacity only 5 percent of the time and even then are only 10 percent covered with cars (Ellen MacArthur Foundation 2015). Cars also impose significant economic costs through impacts on, for example, health costs and absenteeism. The social cost of car use per kilometer per rider in Europe has been estimated at US$0.12, versus a social benefit of US$0.19 for cycling or US$0.39 for walking (Gössling 2020).

A standard approach to sustainable urban mobility is the Avoid-Shift-Improve framework (Bongardt et al. 2019). It involves avoiding unnecessary motorized travel by improving the efficiency of the transportation system as a whole—for example, through transportation-oriented compact city development—by shifting trips away from the most polluting, energy-consuming modes—that is, combustion vehicles—and by improving the impact of individual trips by increasing fuel efficiency and optimizing the operational efficiency of public transportation (Bongardt et al. 2019).

Many cities are acting to promote low-carbon urban transportation policies that contribute to achieving environmental and human health goals (Nieuwenhuijsen and Khreis 2016). Cities like Stockholm, Sweden; Milan, Italy; and Singapore impose congestion charges on cars entering urban centers, particularly during peak commuting hours. Others, including many European cities as well as
developing-world cities like Beijing, have introduced low-emissions zones that impose strict emissions standards on vehicles entering the city center and ban those vehicles that fail to meet them. In Germany, the introduction of such zones led to a 4–8 percent reduction in fine particulate air pollution and reduced the number of days in which air pollution levels exceeded legally allowable levels (Gehrsitz 2017). An emissions tax in Stockholm led to a decline in air pollution of between 5 and 15 percent, and, as a result, a decline in acute childhood asthma (Simeonova et al. 2021). In 2021, the Climate Change and Energy Transition Law in Spain made it mandatory for cities with populations greater than 50,000 to implement low-emissions zones before 2030 (d’Obrenan and Huxley 2022).

Other cities have discouraged car use by providing positive financial incentives, such as free transit passes, and negative ones, such as parking fees and gasoline taxes (Martin, Suhrcke, and Ogilvie 2012), or by making driving less convenient by limiting parking, imposing car-free zones, or implementing traffic-calming or other measures (Pucher, Dill, and Handy 2010; Buehler, Götschi, and Winters 2016).

Investments in public transit are an effective way to combat car-centrism and improve health. One study found that the opening of subway systems leads to an average decline in particulate pollution of 4 percent, with significant mortality benefits (Gendron-Carrier et al. 2018). The World Bank supports the development of innovative public transportation systems worldwide—in Dakar, Senegal, for example, it is supporting the rollout of a bus rapid transit system that will reduce GHG emissions by 434,000 tons while creating 120,000 jobs. The Bank also recently launched the Global Facility to Decarbonize Transport, which will conduct research to help governments prepare bankable, context-relevant projects and complement traditional Bank financing to pilot new, innovative climate-smart transportation programs (World Bank 2022c).

To be feasible, investments in public transportation systems require certain densities. In contrast, active mobility, including cycling, is compatible with a range of urban densities, and cities worldwide are moving to expand cycling infrastructure and generally to make cycling easier, safer, and more attractive. From its origins in 2010, the Ecobici program in Mexico City has become one of the most extensive bike-sharing programs in Latin America, with 480 bike stations across the city, more than 6,000 bicycles, and 276,000 users (von Ritter Figueres 2017). Since its implementation, the Ecobici program has reduced taxi and car use by 8 percent and 5 percent, respectively (Lopez 2015). Reductions in carbon emissions linked to the program are estimated at 499 tons over the program period, as people use bicycles for daily commutes instead of fuel-inefficient cars and buses (von Ritter Figueres 2017). The program’s extent and ubiquity have reduced travel time for many users, making it even more attractive (von Ritter Figueres 2017). The success of the Ecobici program has inspired similar initiatives in other Latin American cities (see also chapter 2), and, given the substantial
health benefits and economic efficiencies associated with active mobility, the World Bank has committed to extensive funding in this area. Indeed, support for active mobility is one of five key system transitions the Bank will support in its Climate Action Plan 2021–25 (Adriazola-Steil et al. 2021).

The World Bank also works to enhance road safety through integrated approaches. In Sierra Leone, the Integrated and Resilient Urban Mobility project aims to develop an integrated corridor management system and to ensure that all roads undergo safety risk assessments and are designed to provide universal access for people with disabilities. Among road safety measures under the project are arterial corridors that ensure safer conditions for all users; safe pedestrian facilities and access to public spaces; and safe access to transportation corridors, stations, and stops. The project also assists implementing agencies and traffic police through awareness campaigns and training activities for road safety enforcement (World Bank 2019c).

Other programs for road safety under the World Bank include the Global Road Safety Facility, a multidonor initiative that provides funding, knowledge, and technical assistance to help different tiers of governments develop road safety management capacity and scale up road safety delivery in developing countries, and the Global Program for Resilient Housing, which recently published a guidance note on making use of big data and machine learning to inform cities’ road safety policies and interventions. The latter report proposes a new methodology to link various datasets—for example, on road networks, road characteristics, and crashes—to develop a road risk evaluation model that has been piloted in Bogota, Colombia, and Padang, Indonesia (Antos et al. 2021).

The impacts of urban mobility are complex. Poorly designed systems can impose significant exposure to environmental pollution, noise, or weather—or unacceptable time burdens—on users, particularly those from marginalized groups. Crime issues can also seriously affect users, especially women. Perceived attractiveness, convenience, timely accessibility, and safety are critical to the utilization of these systems, and engagement with end users is vital to ensuring the feasibility and usefulness of policies and interventions.
3.2 Improved Access to Water, Sanitation, and Waste Management

Healthy cities ensure that city dwellers have equitable access to basic services, and they manage flows of energy and materials to minimize waste. While the private sector often plays a role, provision of basic services usually relies to some degree on publicly funded infrastructure and utilities. Infrastructure for basic services is deeply rooted in the spatial configuration of the city; decentralized systems for water collection or renewable energy production may lessen interdependencies and offer solutions for peripheral communities where connectivity is a challenge.

WATER AND SANITATION

Significant progress has been made on providing equitable access to water, sanitation, and hygiene (WASH), yet much remains to be done. In rapidly urbanizing countries, urban growth is dramatically outpacing service provision, and the poor and residents of informal settlements are the most likely to lack access (see chapter 2). In cities affected by fragility and conflict, additional barriers stand in the way of access to safe water and sanitation services. Climate change will also increase pressure on scarce water resources in many regions where droughts are becoming both more frequent and more severe (Cremades et al. 2021).

Lack of access to safe water and sanitation adds to a wide range of health risks. Even modest fluid deficits can precipitate adverse health events and may be related to a variety of chronic conditions (Maughan 2012). Lack of water can also contribute to poor hygiene (including menstrual hygiene), leading to higher risk of
skin disease, contact-related infections, and urogenital infections, among others. Contaminated drinking water, including from unimproved sanitation, causes nearly half a million deaths per year from fecally transmitted diarrheal diseases like cholera, dysentery, typhoid, and polio, with particular risks for children (WHO 2022). Indeed, water and sanitation are integrally connected: at least two billion people worldwide use a drinking water source contaminated by feces (WHO 2022). Both drought and flooding can further increase risks of contamination and waterborne disease outbreaks. The physical structure of sanitation services can also have important health impacts. Shared or open facilities can be unsafe for women and may increase the risk of urinary tract infections among those who postpone urination because they feel unsafe. Likewise, poorly managed water resources can create opportunities for the transmission of vector-borne diseases.

Water and sanitation solutions played a major role in the sanitary revolution of the 19th century and the evolution of urban planning and public health (see chapter 2). Likewise, cities today are acting to create integrated solutions. Dhaka, for example, is working with the World Bank and other partners to implement the Dhaka Sanitation Improvement Project (World Bank 2020e), which aims to increase residents’ access to safely managed sanitation services by building a new treatment plant, connecting more households to the sewer network, and improving sewage services in informal settlement areas. Conflict-affected cities face a host of challenges in securing interconnected urban services. The World Bank Yemen Integrated Urban Services Project is improving essential urban services, including water and sanitation. The project has provided 900,000 people with access to clean water and sanitation and facilitated the removal of more than a million tons of waste (World Bank 2020b).

In some contexts, decentralized solutions offer promise for meeting water and sanitation needs in challenging contexts. The Revitalising Informal Settlements and their Environments (RISE) Programme, a transdisciplinary research effort in Fiji and Indonesia, is evaluating the potential for a localized, water-sensitive approach to upgrading informal settlements for the delivery of sustainable water and sanitation services, along with other benefits (Leder et al. 2021). The project has attracted funding from four regional governments and the Wellcome Trust, as well as the Asian Development Bank (RISE 2022). More broadly, according to one study,

Decentralized wastewater treatment systems (DEWATS) connected to simplified sewer systems or communal sanitation centers have the potential to close the gap between on-site and centralized systems. Community-managed DEWATS offer the possibility of swift sanitation improvements in high priority neighborhoods that communities can manage themselves, where local government does not yet provide a full sanitation service. (Eales et al. 2013)
Providing water and sanitation services in the context of more frequent and severe drought will be a major challenge for healthy city action in many places. Today, city policy responses to drought typically focus on short-term emergency actions that fail to consider long-term climatic and socioeconomic trends. A review of these issues emphasizes the importance of cross-sector and cross-scale integration, transparency, proactive anticipation of needs and risks, and the visualization of complex networks of influence underlying water decision making and outcomes (Cremades et al. 2021).

The complexity of urban water management issues in rapidly urbanizing contexts makes a strong case for integrated urban water management that “adopts a holistic view of all components of the urban water cycle (water supply, sanitation, stormwater management) in the context of the wider watershed” and integrates problems, solutions, and stakeholders at all stages of the planning process (Jacobsen, Webster, and Vairavamoorthy 2013). Because water treatment is a significant source of greenhouse gas emissions—particularly methane—WASH needs to be considered in city climate actions. Wastewater plants can be important contributors to emissions mitigation efforts, offering possibilities for extracting nutrients from waste for fertilizers, water reuse, and energy recovery (Neczaj and Grosser 2018). The Chennai Metropolitan Water Supply and Sewerage Board in India, for example, has planned and implemented multiple projects to treat and reuse wastewater to become more sustainable and drought-resilient. Through the revenue it generates to cover operation and maintenance costs by selling treated wastewater to industrial users, it recouped capital investment expenditures in less than five years. It also generates over half of the energy required for water treatment through energy recovery from wastewater, reducing both costs and GHG emissions (Delgado et al. 2021).

**WASTE MANAGEMENT**

Poorly managed waste increases health risks in a number of ways. Exposure to waste can occur through bodily contact, penetrating injuries, inhalation, or ingestion, and it can occur at the point of production, during collection, transport, or sorting, or from living in the vicinity of waste facilities (Ziraba, Haregu, and Mberu 2016). Infectious waste can be a source of direct infection for a range of diseases (Global Platform for Sustainable Cities 2021). This includes medical waste, the amount of which surged during the COVID-19 pandemic, mostly affecting the urban poor and informal workers. Other solid waste, such as rotting or fermenting organic matter, can provide breeding sites and sustenance for infectious disease vectors (Krystosik et al. 2020). Mosquitoes that are vectors for
Healthy Cities

urban dengue, for example, often breed in empty car tires or other objects where small water reservoirs are created. Hazardous waste can pose risks of physical injury or chemical exposure.

Waste is usually managed locally, which can be highly burdensome for municipalities in low-income countries. For many local administrations, waste management is the single highest budget line item. Despite these expenditures, waste in many developing countries is often poorly treated in open dumps or landfills (Kaza et al. 2018). There, toxic chemicals can leach into soil, groundwater, or aboveground water bodies, directly affecting humans or the food chain, and they can be a significant source of greenhouse gas emissions, including methane. In many countries, especially low- and middle-income ones, solid waste is burned in incinerators or directly by individuals or communities, also causing significant emissions and worsening local air quality. The clogging of stormwater management systems by waste can even significantly exacerbate flood risks.

Healthy cities tackle waste proactively through integrated waste management strategies, reducing unnecessary or superfluous production (of, for example, excessive packaging or plastic shopping bags) at the source; promoting extended use of products where feasible; and establishing well-functioning recovery systems to sort waste, recycle and repurpose recoverable materials, and reincorporate waste nutrients and energy into circular metabolic flows (UNEP 2011). They manage waste that is not recyclable to minimize harm to people from physical, chemical, radiological, infectious, and other processes and to environments from pollution and GHG emissions. They also act to minimize risk to those regularly exposed to waste, including formal waste collectors and informal waste pickers. Healthy cities ensure that waste collection reaches all affected communities. Importantly, waste management is designed to address not only technical factors but also “soft” factors like human behavior, consent, and participation. Inclusivity in planning is vital to achieving healthy cities (Wilson, Velis, and Rodic-Wiersma 2013).

Cities are innovating with respect to integrated waste management. In Singapore, the co-location of the country’s Integrated Waste Management Facility (IWMF) with its Tuas Water Reclamation Plant (TWRP) creates an important loop of materials, energy, and water flows (figure 3.2). Dewatered sludge from the TWRP is transferred to the IWMF for incineration and energy production, and the energy produced in turn helps run the TWRP. Through this innovative juxtaposition, the plant optimizes land use, maximizes energy recovery, and minimizes environmental impacts.
In low- and middle-income countries, cities face significant technical and resource deficits with respect to waste management. In these contexts, formalizing informal recycling sector activities—which may handle as much as 20–30 percent of waste by weight—can be a “win-win” solution, increasing efficiency and providing jobs for the poor (Wilson, Velis, and Rodic-Wiersma 2013; M. Chen and Ijjasz-Vasquez 2016). Examples of this abound. One is the SWaCH waste pickers’ cooperative in Pune, India, which has, since 2008, offered door-to-door collection of sorted waste, serving 2.3 million residents—a majority of Pune’s households, and up from only 7 percent that were receiving waste collection service previously. The project recycles 50 million kilograms of waste daily and collects US$6.8 million in user fees annually (WRI 2019). The city provides subsidies to informal settlements, which gives SWaCH incentive to extend services to marginalized communities. SWaCH, which grew out of the local trade union for waste pickers, has played a crucial role in negotiations with the municipality (WRI 2019).
Between 2014 and 2021, the World Bank invested US$2.3 billion in improving solid waste management worldwide. Projects included a diverse suite of products and services, ranging from capital investment to build or upgrade facilities to support for service delivery, institutions, planning, and policies, sustainable financing, behavioral change, private sector engagement, and social inclusion. Box 3.3 describes one such successful project in Azerbaijan. A new World Bank report, *Bridging the Gap in Solid Waste Management*, extensively reviews integrated solid waste management systems, which include institutional structures, policy, planning and legal frameworks, financing, and stakeholder engagement (World Bank 2021a).

As urbanization continues apace and waste volumes grow accordingly, cities will need to develop more effective and efficient waste management systems to safeguard health and achieve sustainable development, drawing on both technical and social solutions.

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**Box 3.3. Solid Waste Management in Azerbaijan**

Poorly managed solid waste was a noticeable environmental issue in Baku, Azerbaijan, in the late 2000s, exacerbated by rapid population growth. Smoke from the Balakhani landfill (the main dumpsite for Greater Baku) was visible far and wide. Outside the city center, informal dumpsites were pervasive, especially in new settlements, where service coverage and quality were inadequate. Both formal and informal sites posed health risks to residents and waste pickers. Primary challenges related to solid waste management included limited collection coverage, poor service quality, and a lack of safe disposal options.

Initially enlisted to close the Balakhani landfill, the World Bank proposed an integrated strategy that included rehabilitation of the site, establishment of a state-owned waste management company, development of a national waste management strategy, closure of informal dump sites, and improved tariff and waste collection systems. These actions increased the population served by the formal solid waste management (SWM) system from 53 percent in 2008 to 74 percent in 2012. They also significantly enhanced the water quality of Boyukshor Lake, adjacent to the Balakhani site and seriously contaminated as a result of inadequate SWM before the project.

These actions were complemented by sectoral government investments, including a waste sorting facility that helped achieve a 25 percent recycling and reuse rate. Waste pickers and nearby communities were compensated with full-time jobs with benefits at the sorting facility and homes in the city.

3.3 Sustainable Urban Food Systems

Food is essential to survival, but poorly designed or managed food systems can contribute to substantial ill health and massive environmental impacts. Globally, malnutrition is a leading cause of death. Urban environments often promote poor dietary decisions (for instance, the consumption of processed or sugary foods), while nutritious and safe food is often inaccessible or unaffordable for the urban poor. Many cities are now simultaneously facing the dual challenges of undernutrition and obesity and associated health problems. Food safety depends on the availability of key technology, such as reliable refrigeration (and thus electricity), also a challenge in many places, and on food handling norms and standards. Food choices and provisioning practices shape the interaction between human and wildlife and, thus, the zoonotic transmission (that is, from animals to people) of disease. Food safety, security, and environmental impacts are all bound up in complex patterns of globalization, wherein food often travels around the world before reaching consumers.

Urban growth exerts pressure on food production as built-up areas expand into prime agricultural land. In Bangladesh, for example, 1 percent of the country’s agricultural land is lost annually to land conversion and desertification (Al-Masum Molla 2016). While agricultural productivity has kept pace with urbanization there, it is unclear whether it can continue to meet urban demand while mitigating harmful health consequences, reducing emissions, and increasing resilience (Satterthwaite, McGranahan, and Tacoli 2010). Urban agriculture may play an important, though necessarily limited, role in ensuring food security (Zezza and Tasciotti 2010).
The modern global food system itself is driving various environmental crises. By some estimates, the system is responsible for a third of global greenhouse gas emissions (Crippa et al. 2021). High reliance on chemical fertilizers is exhausting natural reserves of phosphate minerals, and modern agricultural practice is contributing to widespread depletion of soil and groundwater (Brodt et al. 2011). Monocropping and associated pesticide use are reducing biodiversity and food system resilience (Lin 2011), which is particularly dangerous as climate-related pressures on production increase.

Globally, a third of all food produced for human consumption—an estimated 1.3 billion tons annually—is lost or wasted (FAO 2021). The Food and Agriculture Organization (FAO) distinguishes food loss (“the decrease in the quantity or quality of food resulting from decisions and actions by food suppliers in the chain, excluding retailers, food service providers and consumers”) from food waste (“the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers”) (ibid.). The food system is thus vulnerable at all stages of production and supply, but patterns differ by level of socioeconomic development. In low-income countries, food loss predominates, largely because of technical and managerial limitations; in high-income countries, food waste in distribution and consumption is more common (Kaza et al. 2018). Food loss and waste represent a tremendous lost opportunity for minimizing environmental impacts and improving human health.

Food systems also provide livelihoods for billions of people. Indeed, they support most people in many developing countries with both wage and self-employment and will continue to do so into the future (Townsend et al. 2017). Decisions about urban food systems thus have important knock-on effects for poverty and, therefore, for health.

In many cities, especially in low-income countries, food markets are an important source of labor and nutritious food, but they are also associated with outbreaks of foodborne, waterborne, and zoonotic disease. Food markets are often the most affordable and accessible option for local consumers. In Vietnam, for example, wet markets account for 80 percent of fresh product sales in Ho Chi Minh City and 90 percent in Hanoi (Acharya et al. 2021). Close contact of livestock, wild animals, meat, and people in crowded conditions, however, dramatically increases risks of zoonotic disease emergence (Nadimpalli and Pickering 2020; Naguib et al. 2021); in fact, wet markets may have been the proximal point of origin of the COVID-19 pandemic. Poorly managed wet markets can also amplify illnesses other than zoonotic diseases because of an overall lack of sanitation, regulations, and facilities, such as running water (Nadimpalli and Pickering 2020) (see box 3.4).
Box 3.4. Vulnerability of Local Markets in Dhaka, Bangladesh

An estimated 74 percent of food markets in Dhaka face high to extreme health risks from a combination of inadequate basic infrastructure, poor management, and lack of safety practices. While 85 percent of Dhaka’s markets have access to running water, this figure is much lower for the neighborhood and temporary markets that comprise nearly half of all markets, and few markets overall have water purification systems. The risk of food-related health hazards resulting from cross-contamination is higher at 35 percent of markets that do not separate different kinds of food items, including meat and poultry from fresh fruits and vegetables. Just 6 percent of Dhaka’s wet markets have designated butchering facilities, meaning animals are frequently butchered in front of stalls. Less than 60 percent have toilet facilities, which are, given long market hours, a necessity for vendors and customers alike. While 94 percent of markets have electricity, just a quarter have backup supplies. Only 13 percent of markets have designated on- and offloading entrances, and only 4 percent have designated parking, which results in extreme traffic congestion (Tuli and Islam 2014).

Of the most vulnerable markets in Dhaka, over 30 percent cluster in the densest areas of the city, where informal settlements are also concentrated (figure B3.4.1). Indeed, while 77 percent of the informal settlement population lives within reach of markets, just 27 percent have easy access to larger, city-level markets with better conditions. Informal settlements generally encompass neighborhood or temporary markets that are exposed to higher health risks.

Figure B3.4.1. Vulnerable Markets in Upazila, Dhaka

Note: Upazila is the term for a subdistrict in Bangladesh.

The management and governance of markets in Dhaka is challenging, with trust and transparency often at issue. The usage of and billing for electricity, for example, is a cause for contention between market committees and vendors. Given the outsized role wet markets play in the food system, improvements in their functioning could have widespread positive effects for consumers, vendors, farmers, and residents alike.

Healthy urban food systems provide sufficient, nutritious food to all urban dwellers while minimizing all forms of malnutrition, foodborne infectious disease, food-related environmental impacts, and food insecurity. Healthy cities thus promote healthy diets (including through culture-oriented and norms-based interventions) and minimize loss and waste, and they support stable—and, where feasible, local—systems for food production, processing, and delivery, while discouraging unsustainable agricultural practices and encouraging regenerative agriculture.

They regulate food markets; food quality; handling, labeling, and advertising; and the food system at all stages of operation, from production, processing, and distribution to retail sale and consumption. Through their significant role in food procurement, healthy cities encourage sustainable agricultural production and healthy consumption. They also manage urban expansion to preserve agricultural productivity and, where appropriate, encourage urban agriculture as a supplement to food systems.

Demand for integrated urban food systems is increasing, a need that several prominent initiatives are seeking to address:

- The joint World Bank and FAO report *Food Systems for an Urbanizing World* (Tefft et al. 2017) proposes outcomes supported by integrated food system action, including (1) remunerative jobs and better agribusinesses, (2) affordable and accessible food for food security, (3) nutritious, diverse, high-quality, and safe food, and (4) sustainable, resilient agriculture and food systems. These outcomes depend on enabling conditions, including (1) transformative institutions, (2) facilitating and progressive policies, (3) an open data, knowledge, and evidence base, (4) resources for effective public and private financing, and (5) multistakeholder governance mechanisms and capacity.

- The Milan Urban Food Policy Pact offers a comprehensive, systems-based, integrated approach to developing sustainable, healthy urban food systems while fostering city-to-city cooperation and the exchange of best practices. It specifies 37 concrete actions in six categories: (1) enabling environments for effective action (governance), (2) sustainable diets and nutrition, (3) social and economic equity, (4) food production, (5) food supply and distribution, and (6) food waste (MUFPP 2015). To help measure impacts, the pact has a monitoring framework (FAO 2019) that clearly lays out a set of indicators, the rationale for their use, and information on how to collect those data and what expertise and resources are needed. It also serves as a platform to showcase effective examples.

- The *RICH [Reliable, Inclusive, Competitive, Healthy] Food, Smart Cities* report (Acharya et al. 2021) emphasizes the importance of cities in the food system and the complex and shifting contextual factors—such as climate, demography,
and economics—that demand forward-looking, inclusive, integrated action. The study, which reviews food system policies in 170 cities in 23 Asian countries (and yet is relevant for all regions), found that only 8 percent of the sample cities intervene in such systems in ways that are forward looking, holistic, and inclusive.

Because the food system encompasses many of the most important urban-rural linkages, food issues are a crucial dimension of an integrated urban-rural development agenda (Tefft et al. 2017). In general, these linkages allow for exchange of the “complementary assets” of urban and rural areas, encompassing, for example, the economic corridors by which goods, especially food products, come to market (Tacoli, McGranahan, and Satterthwaite 2015). They may also involve pernicious exchanges—for instance, of infectious pathogens. In short, urban-rural linkages strongly affect health through their influence on food availability, the transmission of infectious disease, and so on.

Strengthening urban-rural linkages can improve food security and sustainability. The COVID-19 pandemic highlighted the vulnerability of food supply chains and the importance of moving food production and processing closer to the point of consumption (FAO 2021). Recognizing the high economic and social potential of a localized food supply, cities seek to strengthen urban-rural linkages and promote local products. Kobe, Japan, for instance, initiated the Gastropolis Kobe strategy, which directly connects consumers and producers. The initiative aims to support young, emerging, small-scale agricultural producers and create a locally sustainable economy through multiple projects, including by providing financial incentives to local agricultural businesses that develop and implement projects on improving local food accessibility, food education, and urban farming practices.

In Kenya, a new World Bank project for a safer urban food system seeks to strengthen the linkage between rural and peri-urban food producers and urban consumers. The National Agricultural Value Chain Development Project links selected urban areas with nearby farmer producer organizations and addresses issues of food prices, safety, quality, and security. It provides participating farmer groups with training on safe food production practices, food traceability, post-harvest management practices, cold chain logistics, and hygiene maintenance. It also improves existing local markets and uses e-commerce platforms to reduce inefficient intermediaries. In addition, the project aligns with other urban agricultural initiatives in Kenya to promote commercial urban farming, using techniques like hydroponics and sack gardening to enhance urban food security while also generating new employment opportunities in support services for urban youth.
3.4 Equitable Health Service Provision in Cities

Health, caregiving, and social systems support healthy lives, both directly, through prevention, promotion, and treatment, and indirectly, by providing leadership and knowhow to undertake broader integrative efforts for health. Because the health sector—comprising health facilities, actors, and supply chains, including for pharmaceuticals and medical devices—often has a significant environmental footprint, it can also play a leading role in promoting climate action and safeguarding ecosystem health.

As a rule, access to health services is better for urban populations than rural, although health systems differ greatly from city to city, even within countries. This is in part because the concentration of people in cities makes service provision both easier and more cost effective (Mullen et al. 2016). Health sector infrastructure, such as hospitals and clinics, is also concentrated in cities, as are health professionals, who tend to prefer cities.

Nevertheless, large inequities exist in access, and quality varies significantly among urban health services. In many contexts, government hospitals account for a significant fraction of health spending but are underdeveloped in terms of service provision, as in the case of immunization. Moreover, overlapping and fragmented responsibilities for government and private health systems can lead to gaps or reduced quality in services. As a result, it is not unusual for urban populations, particularly in developing countries, to rely on private, for-profit services. Out-of-pocket spending for health is often a significant burden, and, in some cases an important poverty trap. In India, for example, where responsibility for governmental health service provision is shared in complex ways and differs for different health issues among central, state, and local governments, these
systems exist alongside a private health system that, indeed, provides the majority of services (Mullen et al. 2016). A World Bank review of urban health sector governance in Bangladesh has found similar issues of fragmented responsibilities and varying quality (Govindaraj et al. 2018).

This diversification of function means that a key role of healthy cities is to coordinate the provision of health services and, more broadly, to ensure health coverage for all residents. How this is accomplished is highly place specific and depends on local cultural, economic, epidemiological, and other parameters. In healthy cities, integration also encompasses mechanisms to ensure health sector knowhow is incorporated into—and, to the extent appropriate, guides—action in the many other sectors that affect health, as outlined throughout this report and emphasized in other World Bank studies. Institutional arrangements for integrating health with other sectors are discussed in chapter 4, below.

As with most urban functions, informal settlements pose a significant challenge to the delivery of health services. Generally, such areas have fewer health facilities and health workers per capita, and settlement dwellers are physically more distant from adequate care. Even where care is available, cost poses a significant functional barrier. Subsidized health care is, thus, essential to ensure health equity, as are local institutions to improve reach and build trust in the system. Community health workers, for example, trained to interact with residents and provide basic care and counseling can dramatically increase access to health care. Garg, Nanda, and Dewangan (2016) describe such a program in Chhattisgarh, India—a city of 5.6 million people, of whom 32 percent live in informal settlements—in line with the country’s National Urban Health Mission which aims to provide primary health care services to the urban poor.

Specific programs may also be needed to ensure the health of otherwise marginalized groups, among them women, homeless or floating populations, persons with disabilities, migrants, older persons, racial or ethnic minorities, and others, including intersectional groups. In 2020, the World Bank approved the Health and Gender Support Project for Cox’s Bazaar District in Bangladesh. The project aims to increase the utilization of health care and services to address gender-based violence. It will also upgrade health care facilities and create women-friendly spaces in Rohingya refugee camps, with services including immunizations, tuberculosis screening and treatment, and nutritional support (World Bank 2020f).

Supporting healthy lives often requires social institutions, infrastructure, and services from beyond the health system itself. Healthy cities may provide social support to persons with disabilities, older persons, children, migrants, or others through community centers and social groups, care or recreation facilities,
inclusive design, or regulation that increases the usability of urban space, most of which options require extensive engagement among health, social care, and other sectors. Financial support in the form of social security, cash transfers, or other mechanisms (including, potentially, universal basic income) also often plays a role in promoting healthy lives.

One way cities are innovating to promote health is through the use of new technology to collect or disseminate data, provide education and information, and/or facilitate access to care and cash transfers. The city of Kobe has developed an integrated health care data system for individuals (the first of its kind in Japan), an experimental project that fosters medical systems using information and communication technology (ICT), while a health campaign, My Condition Kobe, promotes a healthy lifestyle through its mobile app (see box 3.5).

During the COVID-19 pandemic, telemedicine also expanded dramatically, supporting overwhelmed hospitals and clinics by providing essential health-related services remotely. In India, the Union Ministry of Health and Family welfare developed eSanjeevani, a telemedicine platform that extended health care services to both urban and rural populations. Rolled out just before the arrival of the pandemic, the platform has provided 10 million consultations in two years of operation, allowing nonurgent patients and those suspected of having COVID to consult health care practitioners without increasing the risk of transmission or further burdening care facilities (Government of India Ministry of Health and Family Welfare 2021).

In healthy cities, health systems reduce their own environmental impacts and play a leadership role on climate actions. The health sector is a major emitter of greenhouse gases, responsible for 5 percent of global totals—comparable to the amount produced by the fifth most polluting country (Karliner et al. 2019). Health sector impacts for other environmental indicators, such as particulate matter (PM); air pollutants (nitrogen oxides [NOx] and sulfur dioxide [SO2]); malaria risk; reactive nitrogen in water; and scarce-water use, range from 1 to 5 percent of global totals (in poorer countries, health-care environmental footprints are typically small, but the intensity is often very high) (Lenzen et al. 2020). Significant reductions in environmental footprint are possible over short periods. The UK National Health Service, the second largest single-payer health system in the world, set out a plan in January 2020 to achieve net zero emissions by 2040; one year later, through efforts targeting its facilities, governance, supply chains, and all other aspects of the system, it had met and exceeded the needed pace of change (NHS England 2022). At COP26 in Glasgow, 40 countries pledged to cut greenhouse gases across their health systems (Choi-Schagrin 2021).
Box 3.5. The ICT-Based Health Campaign “My Condition Kobe”

Since 2019, the My Condition Kobe smartphone app has provided health services for the residents of Kobe, Japan, offering four features (figure B3.5.1):

- Visual personal health information. Users can access all their daily health and lifestyle information, including results of health checkups and measures of weight, body fat, muscle mass, blood pressure, blood sugar level, and heart rate, among others.

- Personalized health advice. Users can receive health advice through self-selected courses on, for example, healthy diet, improving metabolic syndrome (that is, a group of conditions that together increase the risk of heart disease, stroke, and type 2 diabetes), preventing dementia, preventing severe illness, building muscle, and pregnancy.

- Health rewards. Users accumulate points for healthy behaviors (such as entering daily health and lifestyle information, achieving goals, and participating in health seminars), which can be exchanged for health-related rewards, such as coupons for checkups, health goods, and healthy-food vouchers.

- Daily health highlights. Users receive health articles, healthy recipes, and easy-to-follow exercise plans daily, along with notifications for checkups, health events, and seminars.

The application is used not only by individuals but by universities and research institutions in, for example, research on cooperation between medical and nursing care systems and analyses of food purchasing and diets.

Figure B3.5.1. My Condition Kobe

Source: City of Kobe, Japan.
ENDNOTES

1 While a detailed review of all the connections among urban sectors and domains, potential healthy city actions, and health is beyond the scope of this report, a diversity of other publications illustrate that healthy city action encompasses all aspects of urban life. An example is the UK Local Government Association report Health in All Policies: A Manual for Local Government (LGA 2016), which identifies nine key themes for local authorities to incorporate health across the spectrum of government responsibilities while setting out criteria for prioritization and examining thematic interdependencies. McQueen et al. (2012) review intersectoral governance for healthy city approaches (see also chapter 4, below). Making Healthy Places, Second Edition: Designing and Building for Well-Being, Equity, and Sustainability (Botchwey, Dannenberg, and Frumkin 2022) thoroughly reviews the connections between constructed environments and human and environmental health. And the UN-Habitat/WHO publication Integrating Health in Urban and Territorial Planning: A Sourcebook for Urban Leaders, Health and Planning Professionals provides a comprehensive compendium of tools and resources for incorporating health into urban and territorial planning, covering advocacy and entry points with specific guidance and case studies (UN-Habitat and WHO 2020).

2 The WHO Housing and Health Guidelines (WHO 2018), which provide practical recommendations for reducing the health impacts of substandard housing, are a useful starting point for city regulation.

3 Detailed reviews of housing policy and opportunities are also available at the national level. See, e.g., Bower and Buckley (2020) for an example from Rwanda.

4 Based on the Implementation Status and Results Report of the National Affordable Housing Program (PH49408) (Harrison 2022), BSPS has assisted 980,000 households with home upgrades, exceeding the project end target of 823,000 units.

5 Useful starting points for healthy city action to develop or reimagine public spaces are offered by two recent UN-Habitat publications, City-Wide Public Space Strategies: A Compendium of Inspiring Practices (UN-Habitat 2019) and City-Wide Public Space Strategies: A Guidebook for City Leaders (UN-Habitat 2020a), and a World Bank report, The Hidden Wealth of Cities: Creating, Financing, and Managing Public Spaces (Kaw, Lee, and Wahba 2020).

6 Indeed, the design of urban space in hot, dry climates presents significant challenges and demands beyond those faced by more typical cities (Frumkin et al. 2020; Negev et al. 2020).

7 An example is the reference planetary health diet identified by the EAT-Lancet Commission that promotes health within planetary boundaries (Willett et al. 2019).

8 These factors mirror the principles of healthy cities set forth in this report, including integration, use of evidence, participation, and equity.
Enabling Environments for Healthy Cities: Institutional and Financing Arrangements

Healthy cities establish dedicated institutions to plan, implement, monitor, and evaluate progress on healthy city actions, and they set aside dedicated funding for health promotion and interventions. Where appropriate, they foster broad engagement with key stakeholders, including civil society, and participatory governance. This chapter briefly reviews coordination challenges for healthy city institutions, highlights some of the primary forms these institutions take at city scale, and explores several financing schemes, aligned with the TIP framework, to support cross-sectoral, cross-scale, and transboundary institutional arrangements.

4.1 Coordinating Institutions for a Healthy City Agenda

Among the main concerns for governance and finance for healthy cities is establishing a locus of responsibility for health decision making and the authority or mandate to act. One of the most consequential considerations is the balance of power between national and city governance systems. Different countries embody varying degrees of decentralization and devolution in their urban infrastructure and service delivery systems. Decentralization (or localization) has been a core emphasis of the development agenda over the last decades, including both multilateral development banks and United Nations agencies, posited to provide greater efficiency and accountability and to bring to bear the informational advantages of local government (Gadenne and Singhal 2014). Nevertheless, developing countries tend to be less decentralized than developed countries in terms of both service provision and financing (Gadenne and Singhal 2014). Reasons for this may include limitations imposed by central government, dependence on central revenue sources, a focus on redistribution, the historical legacy of colonialism, the extensive role of nongovernmental organizations (NGOs) in public service provision, and others (Gadenne and Singhal 2014).

In some cases, decentralization has empowered local government administratively, but persistent fiscal gaps make cities dependent on intergovernmental transfers, and policy remains driven by central government. In Rwanda, progressive
decentralization since 2000 has created a paradox: development entails significantly more bottom-up participation, and local government has a much greater role than two decades ago, yet the latter is still tightly monitored and technocratic, such that local action is depoliticized and highly coordinated with national policy goals (Chemouni 2016). As a result, cities like Kigali structure governance so that healthy city activities mandated and budgeted for at the national level can be coordinated and managed locally (figure 4.1). Similarly, Sierra Leone’s Local Government Act authorizes city governments to undertake necessary plans for healthy, resilient cities, but the central government remains in control of core urban management functions, such as land use planning and zoning. This has contributed to slow, inefficient processes for planning and implementing healthy city actions (Aki-Sawyerr 2021).

**Figure 4.1. Linkage of Institutions Relevant to Urban Health in Kigali, Rwanda**

Source: World Bank team’s adaptation of draft Kigali Health Strategic Plan 2020–2024.

*Note:* RGB = Rwanda Governance Board; RBC = Rwanda Biomedical Center; REMA = Rwanda Environmental Management Authority; RHA = Rwanda Housing Authority; RTDA = Rwanda Transport Development Authority; WASAC: Water and Sanitation Corporation; REG = Rwanda Energy Group.
Decentralization can spur healthy city action. In Portugal, for example, a 2019 law devolved health care competences to municipalities and intermunicipal associations, empowering them to act and mandating the creation of locally led municipal health plans (Freitas, Rodrigues, and Santana 2020). Elsewhere, results have been mixed. The UK Health and Social Care Act of 2012, for example, “fundamentally changed the operation of the public health system, moving responsibility for the commissioning and delivery of services from the National Health Service to locally elected councils and a new national public health agency.” This led to some improvements in population health but also created fragmentation and uncertainties about funding (Gadsby et al. 2017).

Indeed, fragmentation of responsibility across different levels of government often creates obstacles to achieving healthy cities. In Bangladesh, the Ministry of Health and Family Welfare is tasked with setting standards, packaging services, and managing health strategies and policies for the national health sector. In parallel, Bangladesh city governments are mandated to provide health care services, including primary health care, and to manage hospitals—as well as sanitation, water, drainage, vector-borne disease control, and public safety (Govindaraj et al. 2018). City governments also interact directly with national ministries and technical implementing agencies, while reporting to the Ministry of Local Government, Rural Development, and Cooperatives. The complex structure of public health management across levels of government—and concomitant fragmentation and overlapping of responsibilities—poses challenges to effective health care service delivery and monitoring and evaluation in Bangladesh.

Under some circumstances, such as where significant externalities exist, centralized decision making may yield better results. An effective balance between central and devolved health decision making depends on understanding local contexts and mechanisms of change. Governments need to ensure, for example, that local capacities exist to support decentralization, that sufficient coordination mechanisms are present across units of governance, and that localization does not hinder the achievement of economies of scale (Abimbola, Baatiema, and Bigdeli 2019). Ultimately, healthy cities will adopt the principle of subsidiarity, ensuring that social and political issues are dealt with at the most immediate (or local) level consistent with their resolution (see chapter 3).

While coordination among scales of governance (vertical integration) is a major challenge to decision making for healthy cities, coordination of governance and financing institutions across sectors and domains (horizontal integration) is equally complex and important. The healthy city approach extends beyond health care, encompassing an all-of-city approach to health, as extensively laid out in the literature. De Leeuw (2017), for example, reviews how to integrate
Healthy Cities

non-health sectors in health governance, policy, and action, stressing the importance of conceptual clarity in selecting from readily available methods on a continuum ranging from institutional rearrangement to value-based narratives. Box 4.1 explores vertical and horizontal coordination in the context of air quality management, one of the most challenging, complex urban health issues.

Box 4.1. Governance Challenges and Opportunities in Air Pollution Management

There is no one-size-fits-all solution to air quality governance; best practices are ultimately determined by local conditions in terms of pollutants of interest and existing capacities, culture, and institutional structures. Because different air pollutants (and greenhouse gases) arise from many different sources, governance and financing for air quality need to be designed in a way that addresses and coordinates actions by public and private actors in a range of sectors, including transportation, energy, land use, industry, waste, and food and agriculture. Moreover, because air pollution and its sources transgress political boundaries, coordination is needed among different, and at times conflicting, governance structures at various scales.

The recent World Bank report Pollution Management and the Making of Prosperous Cities (World Bank 2020a) shows that air quality directly affects not only health but the competitiveness of cities and communities, reinforcing the importance of integrated approaches across scales and sectors. A global comparative analysis of city performance and air quality shows that cities can address this challenge through effective management even while continuing to grow rapidly.

The World Bank’s investments in air pollution management in cities illustrate the comprehensive effort required to address air quality. The Air Pollution Prevention and Control Program in the Chinese province of Hebei, for example, developed an integrated monitoring and control system of emissions from key industrial sectors, including iron and steel manufacturing, transportation, and agriculture. It also promoted the use of clean and efficient stoves, the elimination of highly polluting vehicles, and the installation of electric buses, along with enabling infrastructure. From 2013 to 2017, average PM2.5 concentrations in Hebei declined by 40 percent and CO₂ emissions by 6 million tons per year. In 2020, the World Bank financed the Greater Cairo Air Pollution Management and Climate Change Project to help Egypt reduce air pollution and GHG emissions, in line with EGYPT Vision 2030. In addition to establishing air quality monitoring and control tools and systems, the project seeks to implement an integrated approach to managing various pollutant vectors, including by improving solid waste management.

Other efforts are led by WHO, which offers guidance and tools for assessing, planning, and financing air quality interventions and assessing policy impacts through its Urban Health Initiative. Furthermore, its BreatheLife campaign, managed jointly with the Climate and Clean Air Coalition, provides a platform where cities can share best practices in air quality governance, policy, and action.

One way cities foster horizontal integration is by creating structures or bodies that have joint authority over public health and other sectors, from transportation to planning, waste management, housing, and so on. The city government in Kobe, along with local businesses and medical professionals, established a Healthy Creative City Promotion Council to address the diverse health needs of its citizens and implement strategic planning. In 2014, Seattle’s King County adopted a strategic plan and ordinance to integrate health and equity across the county’s activities by creating a multiagency task force and establishing 14 determinants of equity and health against which county activities would be gauged (Wernham and Teutsch 2015). Indeed, a key goal of the original WHO European Healthy Cities project was to create new governance structures for public health at city scale, with municipalities required to establish intersectoral steering committees for health (Green et al. 2009). The characteristics and success of these new structures varied widely, however, given the significant diversity in local governance, competences, resources, and commitments (Green et al. 2009). As has been noted in various contexts, intersectoral structures without ongoing political and managerial support may be ineffective (Holt, Carey, and Rod 2018). Perhaps most important, intersectoral structures need to avoid replicating or deepening existing power differentials or segregations.

More commonly, healthy cities create formal or informal rules (that is, regulations or norms) and incentives to foster coordinated action across existing sectoral governance units. In Wales, UK, the 2015 Well-Being of Future Generations Act imposes a duty on all public bodies to set and publish well-being objectives and take all reasonable steps to achieve them in the interest of sustainable
development while considering, among other things, the need to take an integrated cross-sectoral approach (Davies 2016). WHO’s Health in All Policies approach involves a similar mandate for all sectoral actors to take health impacts into consideration (McQueen et al. 2012). Financial incentives such as grants can also be used to support efforts toward greater integration.

Another way to foster intersectoral engagement is by adopting health-relevant output and outcome indicators in urban planning and interventions and through formal or informal cross-sectoral data sharing arrangements. One means of focusing urban action on health is the health impact assessment (HIA), which has gained popularity since the 1990s as a tool to assess complex health consequences of proposed policies or interventions. There has been little standardization of HIA methodologies, however, and they have been criticized for lack of rigor and effectiveness (Lock 2000; Mindell et al. 2010). Recently, literature has begun to consolidate the field with particular value for healthy city actions. One study (Pennington et al. 2017) proposed health impact assessment tools for urban areas, and the UK government released a briefing for health as an integral component of environmental impact assessment (Cave et al. 2017).

Some cities have also found innovative ways to enable evidence-based policy actions by developing and sharing data across sectors. In Freetown, Sierra Leone, a “chief heat officer” was appointed to address challenges related to extreme heat and climate change issues. The appointed officer is mandated to improve data on heat and housing, which will inform policies to mitigate the overall impact of extreme heat on communities, including informal settlements (Aki-Sawyerr 2021).

Together with vertical and horizontal integration, healthy cities must solicit inputs from beyond government and establish such participatory elements as legitimate components of the governing process. Participation by end users and stakeholders involved in service provision, such as private sector firms or, particularly in developing countries, NGOs, improves the information available to decision makers, who can better align actions with needs. Having the information can also increase feelings of ownership and agency among end users and thereby improve the adoption of interventions (WHO 2021b). With regard to universal health coverage, for example, WHO has identified three nonexclusive primary mechanisms for participatory governance: platforms for direct population engagement, engagement mechanisms at the community level, and engagement with civil society organizations (WHO 2021b). Indeed, in most places, a mixture of public and private entities are involved in direct provision of health services. In particular, unlike in wealthy cities where a large set of social care entities may have responsibility for specific aspects of health, many of the same services in low-income settings may be provided by NGOs.
funded by development agencies or philanthropies or by small-scale private entities. In Dhaka, 80 percent of 1,041 health service delivery points were operated by private actors, the remainder by NGOs or the public sector (Adams, Islam, and Ahmed 2015).

Given the broad intersectoral nature of healthy city action, care must be taken to ensure participatory governance fully incorporates all relevant stakeholders, not only communities and end users, but private sector actors, such as utilities, transportation and housing development corporations, and food sector actors. New institutional structures, analogous to city chambers of commerce or business councils, that directly include nongovernment stakeholders offer one possibility for coordinating participatory engagement in healthy city action. Many cities have, indeed, experimented with participatory health councils (PHCs) in one form or another. Yet, such initiatives are complex and require significant care to be effective. A review of PHCs in Brazil found that, while they were present in 98 percent of cities, power dynamics, information disparities, conflicting incentives, lack of power, resources, and training, and other issues rendered them generally ineffective in influencing health policymaking (Martinez and Kohler 2016). Another institutional mechanism to coordinate governance with nongovernment stakeholders is participatory budgeting, which will be discussed in detail in the following section.
4.2 Healthy City Strategies

City-level health strategies often take one of four forms. They may (1) be integrated into broader urban development plans, (2) be embedded within related thematic urban agendas, such as resilience or smart-city projects, (3) comprise dedicated healthy city plans, or (4) emerge from plans to meet specific health challenges. Each style can help city governments set priorities, define goals, and implement strategic initiatives to achieve better health outcomes.

Many cities embed healthy city initiatives within broader frameworks, such as city master plans—long-term planning documents used to define strategies, priorities, investments, and the spatial layout of cities. Although the City of São Paulo’s Strategic Master Plan has no dedicated health pillar, such vital aspects of urban health as promoting active mobility, increasing green spaces, expanding access to decent and affordable housing, and expanding public service facilities feature strongly (Prefeitura De São Paulo 2014). The American Planning Association describes how health was included in master plans for seven U.S. cities, identifying nine key factors in effective implementation and offering recommendations for each, such as identifying both community and government champions and seeking funding to support them (Ricklin and Kushner 2013).

Inclusion of health at this high level of urban policy and planning can be invaluable, as attested to by a growing literature and global experiences on the need to tackle the upstream determinants of urban health (Black et al. 2018, 2019). Some of the low-carbon planning concepts that can directly or indirectly promote urban health include the following:

- Zoning ordinances separate potentially harmful industrial activities from residential areas.

- Mixed-use development promotes vibrant mixtures of commercial and residential space, thus combating sprawl and encouraging healthy proximity to urban services.

- Mixed-income development fosters the co-location of residents of different incomes as a promising counter to residential segregation, gentrification, and informal settlement development (Diez Roux 2016).

- Transit-oriented development (TOD), Paris’s 15-minute city, and Barcelona’s superblocks are all approaches to limiting urban sprawl and car dependency and encouraging mixed-use, high-density, community-oriented development. TOD involves intentional planning of mixed-use development along transportation corridors, with the density this generates able to support more efficient transportation. The 15-minute city draws on earlier ideas to envision a city where nearly all resident needs (work, education, socialization, day care,
Healthy Cities

retail and food shopping, and so on) can be met within a short walk of home. Superblocks are neighborhoods in which through traffic is limited to essential uses, thus reserving the street network for pedestrians, small parks, and other social uses.

- Beyond the city, well-specified territorial development strategies, including transportation networks, social and educational institutions, and zoning beyond city boundaries, play an integral role in strengthening urban-rural linkages.

Cities also create more circumscribed strategic plans related to health-relevant issues like climate change, technology, or demography, outlining challenges, recommendations, and specific projects to address dynamic urban phenomena. Health is often an important component of such thematic plans. In Fukuoka, Japan, the Fukuoka 100 program seeks to reshape the city for an anticipated surge in the number of elderly citizens, who are expected to make up nearly a quarter of the overall population by 2025. The program includes numerous intersecting initiatives and promotes partnership with multiple stakeholders, including the Fukuoka Regional Strategy Promotion Council (Fukuoka DC). It formulates and promotes regional growth strategies to envision a new future image for Fukuoka, strengthen the region’s international competitiveness, and promote healthy longevity for the Fukuoka metropolitan area. The program encompasses not only health care but also urban planning and design, the deployment of innovative information and sensor technology, and the purposeful evolution of social,
employment, and educational opportunities to expand the options available to elderly citizens (City of Fukuoka 2017). Broadly, it aims to create a social model for super-aged societies, implementing 100 initiatives progressively by 2025. So far, it has rolled out 93 initiatives to address such challenges as dementia, the unemployment of older persons, the need for innovation and technology in health services, and so on. Additionally, the city developed Fukuoka Health Lab, a collaborative and open innovation platform to promote the development of new health care products or services by citizens, private sector, academia, and government. The Health Lab supports evidence- and knowledge-based experiments to strengthen the program.

From the 1990s onward, dedicated healthy city plans have become increasingly common in cities in both developed and developing countries. Such plans define strategies to improve urban health and identify specific projects to meet their objectives, typically over a time horizon of five to ten years. Cities emphasize different aspects of health, depending on local context, but generally focus on managing the urban environment to improve the health of city residents. In Australia, the Healthy Canberra: ACT Preventive Health Plan 2020–2025 provides a roadmap for achieving Canberra’s vision for its citizens “to enjoy the highest standards of health at every stage of life and to take part in the opportunities our city has to offer” (ACT Health Directorate 2019). It comprises two three-year action plans, the first of which, published in 2019, focuses on providing support to children and families, enabling active living, improving diets and nutrition, reducing risky behaviors such as smoking and drinking alcohol, and promoting healthy behaviors and an age-friendly urban environment (ACT Health Directorate 2019).
Healthy city plans vary greatly in focus, but generally address five cross-cutting themes:

- Engagement. The plans define the stakeholders to be involved in the planning and implementation of the healthy city strategy, including levels of government, departments, and agencies, nongovernment organizations, and civil society actors. The stakeholders involved in healthy city plans depend on the system of governance and the ways in which the cities are managed.

- Alignment with existing efforts. Because health is a cross-cutting issue, it is usually addressed implicitly or explicitly on a variety of existing agendas. Good healthy city plans aim to support existing initiatives without duplicating effort.

- Management and oversight. Effective healthy city plans depend on clear lines of responsibility and authority. Approaches vary. In some cases, an individual is designated or appointed as a plan coordinator, while in others an agency or department has primary responsibility. Responsibility may also be delegated to a dedicated quasi-autonomous body or interdepartmental institution.

- Financing. Adequate, sustainable financing is crucial to the success of any healthy city strategy. Financing may derive from local revenues or intergovernmental transfers from higher levels of government. Locally, it often derives from health department budgets, sometimes co-financed by other units. In developing countries, financing for healthy city plans is often supplemented by NGOs or private and philanthropic spending.

- Monitoring and evaluation. Frameworks for monitoring and evaluation are designed to assess progress toward specific objectives and measure the impact of projects and programs. They provide an important measure of accountability for healthy city plans.

Recent years have shed light on deficiencies in many healthy city plans, including failures to address pandemic risks and mental health crises. A lack of feasibility or operational relevance is another frequent target for criticism. Nevertheless, healthy city plans will almost certainly continue to play a major and growing role going forward.

A fourth typical city-level urban health strategy derives from issue-specific plans that naturally span multiple urban sectors. Action plans on air pollution, heat risks, pandemic preparedness, or disaster risk reduction, for instance, can touch on nearly all aspects of urban governance. A significant example in India is the Ahmedabad Heat Action Plan, which “establishes key strategies to reduce the health impacts of extreme heat on the city’s most vulnerable populations (Amdavad Municipal Corporation 2019).” The first plan of its kind in South Asia, it has inspired similar action in many other cities in developing countries. Aside from specifying a range
of actions to be taken across multiple sectors to reduce vulnerability and respond to heat events, the plan creates an intersectoral communication and coordination mechanism, empowering a “nodal officer” of the local municipal government to implement necessary actions (ibid.). An evaluation of the plan estimates that in the two years following its launch, all-cause mortality in Ahmedabad’s hottest months decreased by 25 percent (NRDC 2015).

Existing healthy city strategies reflect the evolving recognition of the multisectoral nature of health and the need to integrate it into broader urban agendas. In Kigali, urban health policies from the early 2000s focused largely on health service delivery and the prevention of communicable disease, but the last decade has brought additional emphasis on noncommunicable diseases and the environment, as well as on increasing integration among policies and strategies regarding issues that link urbanization and health (figure 4.2). The City of Kobe also transformed its urban development policies in response to the Great Hanshin-Awaji earthquake in 1995, announcing and implementing a series of strategic plans to enhance not only health services but also other aspects of well-being, including economic and social factors and the natural and built environments (box 4.2).

Figure 4.2. Evolution of Urban Health Focus in Kigali Planning Strategies

2000–2012

**FOCUS:**
- Curative health services
- Communicable disease prevention
- Access to water, sanitation, SWM
- Food security and malnutrition

**SEEN IN:**
- Vision 2020

2012–2020

**FOCUS:** AS FOR 2000-2012 PLUS
- Environmental protection
- Noncommunicable diseases
- Green growth

**SEEN IN:**
- EDPRS II – 2013–2018
- Green Growth Strategy – 2011
- Ministry of Health – Sector Policy 2015
- 4th Health Sector Strategic Plan – 2018–2024
- City Development Strategy 2013–2018
- National Urbanization Policy 2015

2021–

**FOCUS:** AS FOR 2012-2020 FOCUS PLUS
- Integrated approach to urban issues and health challenges
- One Health
- Resilience

**SEEN IN:**
- NST 1 (2018–2024)
- Kigali Master Plan 2020
- Vision 2050
- DRAFT One Health Strategic Policy 2019–2023
- DRAFT City Resilience Strategy
- DRAFT CoK - Health Strategic Plan 2020–2024
- DRAFT Kigali Integrated Development Strategy (2021–2024)

Sources: Government of Rwanda 2014, 2019, 2020; Pose and Samuels 2011.
Box 4.2. Healthy City Strategy of Kobe City, Japan

As part of reconstruction after the Great Hanshin-Awaji earthquake in 1995, Kobe has continuously promoted an integrated approach to healthy city action, with a focus on both human and ecosystem health. The city has also shifted its core business from heavy industry and manufacturing to the service, biomedical, and pharmaceutical industries. In 2017, Kobe launched the Healthy Creative City Kobe initiative, which produced integrated health care data systems and a mobile app for health campaigns (see more in chapter 3), and established the Healthy Creative City Promotion Council. More recently, the city launched the Kobe 2025 vision, which highlights its rich natural assets, diverse cultural background, and experience in urban resilience.

In response to the COVID pandemic, the city updated its 2025 vision to include seven health-relevant strategic goals:

1. Promoting economic growth through the creation of attractive jobs and industry-academia collaboration
2. Supporting pregnancy, childbirth, and childbearing and enhancing unique educational environments
3. Creating diverse cultures, arts, and attractions
4. Creating safe social systems for times of natural disasters and pandemics
5. Realizing a safe, healthy, and carefree way of life
6. Developing city spaces and infrastructure that will be sustainable through the years
7. Revitalizing local communities through the involvement of a diverse citizenry

The city has prepared multiple programs and initiatives for each goal, which can easily be seen through a healthy city framework. Health-focused urban planning, city management, and economic development will contribute to making the city livable, sustainable, and competitive (figure B4.2.1).

Figure B4.2.1. Kobe City’s Healthy City Approach

A unique feature of Kobe’s healthy city strategy is its strong focus on strengthening linkages between urban and natural ecosystems by, for instance, supporting local food value chains and cultural initiatives, such as the Satoyama Program. Satoyama is a term for a traditional Japanese rural landscape, connoting a model of harmonious coexistence of humans and nature in areas between the cities and mountains. With social issues such as an aging population and a decreasing number of successors for farmlands, and with people looking for alternative ways of living—especially post-Covid—the satoyama lifestyle (for example, experiencing rural lifestyle while working remotely or commuting to the urban core areas for a daily job) is emerging as a preferred choice in Kobe. By working through the program to rehabilitate deteriorated satoyama areas that encourage such hybrid urban-rural lifestyles, the city aims to enhance the health and well-being of both urban dwellers, by improving their access to nature, and rural residents, by creating jobs and socioeconomic benefits for them. The Satoyama Program is accompanied by a startup program called Noson (agricultural village in Japanese) that supports local business development in underutilized satoyama areas.
Importantly, healthy city strategies hold value only insofar as they are developed based on relevant evidence, including not only health and environmental outcome data but data on a wide variety of urban risk factors, as well as on qualitative information and health-relevant narratives obtained through broad consultation with diverse stakeholders. Healthy city strategies continually incorporate lessons learned from successes and failures, adapting to new evidence and changing course when warranted.

One crucial area in which cities need to develop new capacities for managing, interpreting, and using evidence is that of so-called big data. Generally, this terminology describes large and rapidly growing datasets with significant variety in variables. Many cities—especially but not exclusively in developed countries—are already dealing with such issues, and data scope, size, and influx are likely to increase dramatically as sensors become more prevalent (as in the Internet-of-Things). Traditional approaches and software for data analysis may struggle with such data. It is important to ensure the pursuit of novel approaches to data management doesn’t distract from smart-but-simple actions that are already informed by significant evidence.

### 4.3 Sustainable Financing for Healthy Cities

As highlighted above, adequate, sustainable financing mechanisms are essential to the successful planning and implementation of healthy urban policies and interventions. Financing may derive from multiple sources, including intergovernmental transfers, local revenue, co-financing among different public entities, and private sector or philanthropic sources. The availability and feasibility of various financing options varies with local factors, including the degree of decentralization, institutional and planning capacity, and the visibility of the urban health agenda, among others.

Intergovernmental transfers are crucial for healthy city action, especially where local revenue is low, as in many low-income settings. In many low- and middle-income countries, most health spending is by local governments (Glassman and Sakuma 2014). Intergovernmental transfers raise questions of allocation (such as, what is the process and what are the criteria for allocating funds?), incentives (do transfer conditions promote health results to be achieved, sound fiscal management, autonomy?), and accountability (are transfers transparent, and do they hold grantors and grantees accountable for system design and results, respectively?) (Glassman and Sakuma 2014). In some countries, ministries of health fund not only the local health sector but also a broad range of health promotion activities, including ensuring public safety, providing healthy school diets, providing incentives for physical activities, and raising awareness of urban health challenges through communication and participation, among others.
Local revenues, derived from local taxes (including property, sales, and income taxes), fees and charges (such as parking meter fees, sewerage fees, and tolls), or other revenue streams may be used to fund healthy city action. A review of U.S. jurisdictions found that 3.31 percent of local revenue was allocated to health departments (McCullough, Leider, and Riley 2015). In Wonju, Republic of Korea, which adopted a Healthy City Charter in 2005, revenues from a tobacco consumption tax were earmarked for the city’s comprehensive healthy city program (Nam et al. 2011), which encompassed a total of 40 thematic projects, including on healthy urban and natural environments, health care systems for the urban poor, and health industry development.

Co-financing (also known as joint financing) involves pooling funding across several government sectors to foster more successful identification and implementation of multisectoral “win-win” solutions for health (McGuire et al. 2019). A systematic review found 81 cases of co-financing, nearly all (93 percent) in high-income countries, and usually aimed at integrating services across sectors, although some focused on health promotion beyond the health sector (McGuire et al. 2019). Joint financing can foster a shared working culture among departments but can suffer if roles or goals aren’t clear (McQueen et al. 2012; McGuire et al. 2019). A different type of co-financing involves releasing funds from a delegated financing authority to secure matching funds from an external entity (McQueen et al. 2012). This has the intended effect of mobilizing more resources for health. The Austrian Health Promotion Foundation, for example, co-financed 21 percent of total project costs, on average. The remainder was invested by local and state governments and project partners such as companies, insurers or other external funders” (McQueen et al. 2012).

Participatory budgeting is a way to allocate municipal budgets for local community needs, generally based on multistakeholder deliberation and voting among alternative projects. Cabannes (2015) reports that over 1,700 local governments in more than 40 countries practiced some level of participatory budgeting in 2013. One frequently noted example is Medellín, Colombia, where a major health and social transformation in recent decades rested in part on funds set aside for local community use and on broad, consultative, participatory processes to guide decision making and increase budget absorption (Corburn et al. 2020). The city reserved 5 percent of the municipal budget for the councils of local “comunas,” with budgets increasing from roughly 60 million to 150 million Colombian pesos between 2005 and 2015 (Corburn et al. 2020). Funded projects addressed issues ranging from public safety to environmental remediation, local agriculture and food security, and cultural promotion. Despite substantial interest in participatory budgeting, robust evaluations of its impact on health and well-being are rare and should be prioritized (Campbell et al. 2018).
In practice, most cities in the developing world face difficulties in generating sufficient revenue and securing sufficient intergovernmental transfers to fund urban infrastructure and services, much less healthy city action specifically. Strained public funding often leaves such cities heavily dependent on other sources, such as NGOs, private and philanthropic spending, and/or concessional loans or credits from international financing institutes. In Bangladesh, urban primary health care services have been mostly outsourced to NGOs and private sector providers, which remain largely unregulated, with little data available as to their performance (World Bank, 2018). Public-private partnerships can be an effective channel for financing healthy infrastructure and services in resource-scarce cities. In 2015, for example, the International Finance Corporation and the Chinese multinational construction and engineering CITIC Construction Company launched a US$300 million investment platform to develop affordable housing in sub-Saharan Africa (IFC 2015).

Obtaining financing for health and well-being in informal settlements is especially challenging, as neither the cities where informal settlements predominate nor informal settlement communities themselves typically have the revenue base or sufficient fiscal transfers from central governments to support such efforts. International donor financing instruments play a key role in closing this institutional and financing gap. Results-based financing tools are a prominent example, often targeting the urban poor to improve social and physical assets in low-income areas through financial incentives. In tandem, various schemes, such as microfinance and community development funds, can boost the resources of individual informal settlement dwellers or communities. In Djibouti, the World Bank financed an integrated informal settlement upgrading project in support of the country’s Zero Informal Settlements Program, which established a community development fund that reinforces communities’ role in enhancing the living environment by promoting the provision of safe water supplies and sanitation facilities, the planting of trees, the collection of solid waste, and other such activities.
ENDNOTES

1 And, indeed, they are less decentralized than developed countries were in previous stages of development (Gadenne and Singhal 2014).


3 "Health impact assessment (HIA) is a process which systematically judges the potential, and sometimes unintended, effects of a project, program, plan, policy, or strategy on the health of a population and the distribution of those effects within the population. HIA generates evidence for appropriate actions to avoid or mitigate health risks and promote health opportunities. HIA guides the establishment of a framework for monitoring and evaluating changes in health as part of performance management and sustainable development." (Winkler et al. 2021)


5 The full list of factors was champions, context and timing, outreach, health priorities, data, collaboration, funding, implementation, and monitoring and evaluation.
Conclusion

Although cities have made significant progress in assuring the health of urban dwellers, significant challenges remain. Fragmented, short-term decision making and a failure to set health as a primary performance goal for urban actions and systems mean that cities worldwide not only miss opportunities to improve health; they contribute to ill health and climate change. While an increasing focus on climate change has spurred cities to environmental action, current efforts fall far short of needs, and cities continue to be responsible for the lion’s share of human impacts on the environment. The myriad linkages between human and ecosystem health, some outlined in this report, are only now beginning to be fully appreciated.

This report has sought to re-envision the role of cities in promoting the health of people and the planet. It has provided an action framework for urban policymakers and practitioners to conceptualize and implement healthy city action, drawing upon the World Bank’s longstanding experience in urban development, and emphasizing three fundamental principles for action as essential to healthy cities: targeted support for the most vulnerable; integration across sectors, scales, actors, and geographies; and evidence-based preparedness for future health and climate crises. The challenges and potential actions presented in the report are intended to be starting points for the in-depth exploration that will be needed to achieve healthier futures.

The TIP framework suggests both overarching, strategic actions to enable and catalyze change that promotes health and specific actions for sustainable urban development. Below we review some of the most important, while stipulating that this list is not exhaustive:

To permit targeted support for the most vulnerable, we recommend the following steps to city leaders:

1. Identify vulnerable populations, ensure they are counted in regular data collection, and ensure the data can be disaggregated to gain an understanding of their needs. The design of regular surveys (for example, the gathering of administrative data that exclude those not receiving services) or difficulties in sampling certain populations (for example, in slums) can exacerbate vulnerabilities by masking deprivation.
2. Focus on equity as a regular and explicit objective of city design, planning, and management processes and of development interventions. This includes incorporating equity goals in key performance indicators, regular stocktaking, and including marginalized groups in monitoring and the assessment of progress on equity.

3. Ensure that vulnerable populations are fully represented in healthy city action, including through public consultation, participatory governance, proactive training (for example, in leadership) and hiring programs, community organization, and other means.

To foster effective integration, it is important for city leaders to do the following:

1. Establish a city-level authority with responsibility for urban health, and invest it with the power to monitor and assess progress, identify and communicate gaps, coordinate among actors, and act in its own right. This includes clear demarcation of lines and limits of authority. While many different institutional arrangements are possible and not all action must be centralized, optimal progress is unlikely without a clear locus of authority.

2. Create incentives to ensure human and ecosystem health objectives become part of urban planning and action in non-health sectors (and that the health sector sees itself as a partner in such efforts). Incentives may include the mainstreaming of health and environmental impact assessments, the expansion of key performance indicators, the provision of joint financing opportunities, and the establishment of norms and standards, among others.

3. Expand and, where appropriate, standardize and formalize mechanisms for communication and consultation among sectors, including health, disaster risk management, environment, and others; domains (for example, public/private); and scales of government. These mechanisms can be implemented through interdepartmental bodies, public-private partnerships, community outreach, and other means, as appropriate in the local context.

4. Allocate explicit financing for urban health, structuring it where possible to increase incentives for integrated action. Joint financing, participatory budgeting, land value capture or other local revenue, or other arrangements may be pertinent, depending on local cultural and institutional factors.
To cultivate evidence-based preparedness, city leaders will need to focus on the following:

1. Adopt an ambitious (yet feasible), action-oriented healthy city strategy, either as a standalone plan or integrated with other relevant planning agendas. Such a strategy should identify key actors and responsibilities, clarify links to preexisting agendas, specify financial and human resourcing, define priorities and goals over the short, medium, and long terms, assess and provide for contingencies, and enumerate specific actions to be taken.

2. Establish an evidence base and a plan and resources for ongoing data collection. Cities will have different priorities, needs, and possibilities when it comes to evidence, but, at a minimum, regular data at different scales (including neighborhood, city, and regional levels) should be collected on key health outcomes and risk factors, as well as environmental impacts. In some contexts, partnership with international civil society, the local academic sector, or communities may offer opportunities for growing the evidence base.

3. Conduct forward-looking health risk assessment, considering not only the potential for acute shocks but also demographic, cultural, technological, epidemiological, and environmental trends. Planning horizons will need to expand beyond the political cycle and account for the long-term evolution of the city and the context in which it is situated.

4. Ensure that urban health systems are equipped to provide affordable, adequate health care services to all and to be resilient and flexible enough to respond effectively to surging demand during future health crises. This includes strengthening the resilience of individual health facilities by, for example, upgrading buildings, equipment, capacity, and protocols and through staff training.

While these overarching recommendations apply to all cities, achieving and sustaining human and ecosystem health will require an array of specific actions across multiple sectors, scales, and geographies. The precise optimal mixture of actions will always depend on local capacities and resources, risks and challenges, and cultural and social preferences, but this report has highlighted four clusters of urban features within which actions are likely to have a substantial impact, and which can serve as entry points for a broader approach. Table 5.1 offers a summary of specific actions in each of these clusters related to the TIP framework discussed throughout the report.
Table 5.1. Summary of Healthy City Actions Related to the TIP Framework

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| **Urban spaces:** Housing and buildings, public spaces, and transportation | • Develop and enforce integrated standards for healthy housing that account for multiple risks.  
• Use health-positive, neighborhood-level standards, zoning, plans and regulations (including compact development, public space rehabilitation).  
• Adopt integrated plans for road safety (e.g., separating pedestrians and cyclists from road traffic, gender-inclusive design). | • Provide decent, affordable housing that meets current and future population needs.  
• Design and manage resilient urban assets, including housing, transportation, and public spaces, that function effectively throughout the life cycle.  
• Account for future climatic conditions when designing urban assets (e.g., apply nature-based solutions). | • Create incentives and regulations (e.g., mixed-use development) to limit residential segregation.  
• Partner with civil society and end users.  
• Subsidize affordable and environmentally friendly housing.  
• Improve informal settlements (including in situ upgrading approaches, land readjustment). |
| **Urban services:** Water, sanitation, and waste | • Adopt integrated water management strategies, jointly addressing water supply, sanitation, and stormwater management.  
• Consider locally appropriate, climate-smart solutions for water treatment.  
• Deal with waste proactively through integrated waste management strategies. | • Assess and address future water needs and availability.  
• Proactively plan for new development and sustainable management of water resources. | • Consider decentralized WASH solutions (e.g., natural filtration and waste remediation) for informal communities.  
• Involve local communities and end users in SWM (e.g., by formalizing informal recycling sector activities). |
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| **Urban food systems** | • Develop and implement integrated food systems to limit environmental and health impacts (including infrastructural, agricultural, behavioral, and commercial interventions).  
  • Manage urban expansion to limit losses of productive agricultural land.  
  • Upgrade local food markets to reduce associated health risks.                                                                                                                                      | • Diversify supply chains, foster local production where feasible, and minimize food loss and waste.  
  • Assess and monitor food availability, consumption, and related determinants.  
  • Strengthen urban-rural linkages to improve the efficiency of local food value chains, manage associated health risks, and provide local jobs. | • Identify and address spatial and social gaps in food availability (e.g., food deserts).  
  • Support informal food system workers and local communities by providing training, facilities (e.g., market stalls) and relevant health and environmental regulation. |
| **Urban health services** | • Build institutional linkages between health and other sectors, and promote norms of collaboration and cooperation through directed communication.  
  • Foster integrated health service delivery, removing regulatory and institutional barriers where feasible.  
  • Leverage health professionals to build public support for healthy city action across all sectors.                                                                 | • Monitor, assess, and research disaggregated data relevant to healthy city decision making.  
  • Capture new dimensions of urban life relevant to health by using disruptive technologies and partnering with private sector firms, where relevant. | • Adopt universal health coverage as a central goal in healthy city strategies, coordinating as needed with national-level health policy.  
  • Subsidize health care for residents of informal settlements, and make use of community health workers, mobile health, and other innovations to reach the underserved. |
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108


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