



Cities can care for people and enable them to care for others, making urban health possible

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In particular, the present paper has contributed to Chapter 5 on "Caring", which focuses on the multiple actions that promote the care of diverse groups within society through safety nets and solidarity bonds, and the ways in which local and regional governments can promote caring practices that support vulnerable groups, as well as those that have historically "taken care" of others.

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By creating the conditions for health in many ways - through healthcare, childcare, public safety, community and economic development, parks and recreation, among others - local governments care for people. In this paper, three significantly influencing ways are discussed: a closer look at the role of local governments in providing water, sanitation and hygiene (WASH), urban planning, and transport shows that their contribution to healthy urban lives is unparalleled but faces significant challenges. Affecting change in urban agglomerations,

where the contestation of public goods and private interests make the role of a local arbitrator essential, is complex. **More than arbitrators, local** governments have often represented the collective wellbeing and generated equity. As such, when they fall short, the consequences for health are disastrous. Finally, a framework for navigating complexity and lessons from the participation of local governments in urban governance during the COVID-19 pandemic give local governments tools for their central role in working toward health for all.



An urban agglomeration – a city, town or suburb – can be thought of as an open "system of systems". As an open system, its "parts" interact with its environment by exchanging energy, materials and information, changing the structure of the parts and the system itself. One such "part" of an urban agglomeration is the health system. made up of the organizations, people, relationships and environments that affect health. Local governments and administrators (hereinafter referred to as cities) are a key actor within health systems and simultaneously within urban agglomerations.

This paper elucidates the role and challenges of cities in contributing to healthy urban life. It poses the

potential for widening benefits in cities, the challenges faced, why there are shortfalls and their implications. Section 1 shows that cities "care" for people through their significant influence on social, economic and environmental conditions, essential for urban health. It also highlights that the complexity of the task overwhelms cities' resources and that much is left to do. Section 2 gives insight into the challenges limiting cities from "caring" further, while highlighting the debilitating effects of inequities. Finally, Section 3 recognizes the resilience and ingenuity of cities and provides a framework and lessons from governance "under fire" – during the COVID-19 pandemic, to equip them for invaluable continued efforts on the path to health for all.

The contribution acknowledges that achieving the Sustainable Development Goals means that people will enjoy health. At the same time, healthy people are going to attain those goals. Since health is both the means and the end it becomes paramount as does enabling cities to act.

1. Cities "care" for people by providing the conditions for health and wellbeing. The immense potential of their contribution.

This section describes three illustrative ways that cities care for people, ultimately creating the conditions for healthy living. They provide **water**, **sanitation and hygiene (WASH), urban planning and design, and transport**.

These pathways to health were selected due to both the weight of evidence linking them to health outcomes and the primary role cities have in their delivery. Additionally, in many places globally, they represent the greatest contradiction between potential for and delivery on urban wellbeing. Importantly, cities have varying levels of influence over other urban services that are essential for health. Services such as healthcare, childcare, public safety, libraries, parks and recreation and community and economic development. These and others, are not addressed directly, mainly due to limitations in scope of this paper. In addition, powers over these services are more likely to be shared with other levels of government and they have been given more limited attention in the urban health literature.

1.1 Cities provide for health through Water, Sanitation and Hygiene (WASH)

Key Messages:

► Densely built human settlements when poorly constructed have put people at risk of disease from the beginning. WASH services represent often the first and most significant set of public health measures cities take to prevent ill health. ► Incomplete notions of health and disease drivers and systems shape city infrastructure. Resulting subpar infrastructure can outlast its benefits, adding to the complexity of productive adaptations for health.

► The contribution of cities to health is invaluable, and should be recognized and enabled.

Notions of disease shape how cities are envisioned including the type of infrastructure, its objectives and permanence.

Cities globally care for citizens by creating essential conditions to preserve human health. In various ways, cities separate spaces where humans live from the agents that cause disease. The provision of water, sanitation and hygiene (WASH) is one example. WASH has become a critical way cities world-wide contribute to health.¹

Throughout history, epidemics such as the plague and cholera led to public efforts to protect people from the threat of disease. A historical perspective to the development of WASH systems shows how notions of disease and health have shaped collective efforts to build cities.² These notions continue to evolve as new theories and evidence emerge. Before the 18th century, disease was considered to be a sign of poor moral or spiritual condition and was addressed with prayer and piety.³ By the 18th century, the epidemic spread of disease was addressed through isolation of the sick and guarantine of travelers.⁴ The miasma theory of disease, prevalent at this time, came from the belief that filth and foul odours caused epidemics.⁵ Environmental sanitation, mainly through improving water-supply systems and drainage networks to remove sewage and waste, became the primary defense against disease, influenced by the Edwin Chadwick's "sanitary idea".⁶ Chadwick resolved that preventing disease was possible by distancing sewage and waste that caused harmful foul air from humans.⁷ Cities and citizens, in pursuit of collective security, developed sanitation, and the notion of public

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2. Kim Knowlton, "Urban History, Urban Health," *American Journal of Public Health* 91, no. 12 (2001): 2000–2002.

3. Richard D. Remington et al., *The Future of Public Health* [Washington, DC: National Academy Press, 1988], https://www.ncbi.nlm.nih.gov/books/NBK218224/.

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5. Knowlton, "Urban History, Urban Health."

6. Martin V. Melosi, The Sanitary City: Environmental Services in Urban America from Colognial Times to the Present (Pittsburgh: Pittsburgh Press, 2008), https://www.jstor.org/stable/j.ctt6wrc97.

7. Knowlton, "Urban History, Urban Health"; Melosi, The Sanitary City: Environmental Services in Urban America from Colognial Times to the Present. health emerged as the most important line of defense against illness.

Subsequently, the bacteriologic theory, prevalent from 1880 to the Second World War, provided scientific basis for public health, focusing mainly on specific contagious diseases such as tuberculosis, diphtheria, typhoid and yellow fever, leading to interventions such as immunization and water purification techniques.[®] W.T. Segwick, consulting biologist for Massachusetts claimed that "before 1880 we knew nothing; after 1890 we knew it all; it was a glorious ten years".[®] During this time occured a transition from preventative health to curative health through biomedical interventions. The role of the city as a principal actor in providing health diminished, as sparks of believing "we know it all", drove intense efforts to cure biomedically. Meanwhile, in low-and middle-income countries (LMICs) urban areas have remained places where biomedical solutions arrive last, as continues to be evident with the roll-out of COVID-19 vaccines. Deep segregation persists in these areas locating working people in places without access to WASH, near polluting industries and in crowded housing.

Cities can prevent mortality and morbidity through WASH

Contemporary figures from 2017 indicate that 5.3 billion people (71 per cent of the global population of 7.55 billion) used a safely managed drinking water service – one located on premises, available when needed and free from contamination (See: Figure 1 and Figure 2).¹⁰ ¹¹ Also, 3.4 billion people (or 45 per cent of the global population) used safely managed sanitation services – an improved toilet or latrine that is not shared from which excreta are safely disposed of, in situ or treated off-site (See: Figure 3 and Figure 4).¹² ¹³ Local governments globally build and manage this life-saving infrastructure and prevent significant suffering, while contributing directly to the health and wellbeing of people

world-wide. WASH is a precondition for the fulfilment of other human rights such as education and the right to privacy and integrity. For example, functioning toilets in schools mean girls can attend when menstruating and, in communities, it means women and girls are less at risk of being victimized in secluded open defecation sites. Figures 2 and 4 are incredibly disturbing for their representation of inequity. They don't show the same inequity within countries, the fact that the functioning of water services have become unpredictable, even where infrastructure is apparently there, due to poor investment in maintenance and moves to individual privatized arrangements, including individual boreholes in cities.

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Drinking Water, Sanitation and Hygiene 2000-2017 Special Focus on Inequalities, Launch Version July 12 Main Report Progress on Drinking Water, Sanitation and Hygiene, 2019.

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Figure 1 Global drinking water coverage, 2000-2017(%) Source: WHO/UNICEF 2019 fig 1, p. 7 Figure 2 Proportion of population using safely managed drinking water services, 2017 (%) Source: WHO/UNICEF 2019 fig 3, p. 7 Figure 3 Global Sanitation Coverage 2000-2017 (%) Source: WHO/UNICEF 2019, fig. 4, p.8 Figure 4 Proportion of population using safely managed sanitation services, 2017 (%) Source: WHO/UNICEF (2019, fig. 5, p.8)



In low-and middle-income countries (LMICs) malaria, undernutrition and others continue to affect health as result of inadequate WASH with costly social and economic implications.

Despite, a significant contribution from cities, much is left to do. Inadequate WASH represents 2 million preventable deaths and 123 million preventable disability-adjusted life years (DALYs).14 Fifty-three and sixty per cent of those preventable deaths and DALYs. respectively, are concentrated in Sub-Sharan Africa.¹⁵ It results in 12 major diseases, adverse health outcomes or injuries and links to 14 additional diseases or adverse health outcomes.¹⁶ Two illustrative examples of the pervasive negative effects of inadequate WASH on health are Malaria and undernutrition.

Currently, the vector-borne disease Malaria results in the death of a child

every 2 minutes.¹⁷ Malaria has largely been contained in urban environments of high-income countries. Strategies for containment include vector control measures such as the management of drains, gutters and wastewater and the maintenance of water supply and sanitation areas.

Undernutrition is another "downstream" effect of inadequate WASH. **Each year approximately 829,000 people die from diarrhea as a result of unsafe drinking water, sanitation and hand hygiene, including nearly 300,000 children under the age of five**.¹⁸

Diarrhoeal disease and environmental enteropathy inhibit nutrient absorption, leading to undernutrition and resulting in 45 per cent of all deaths of children under the age of five.¹⁹ Furthermore, figures from 2020 show that yearly those affected that do not die are at risk of being stunted or to experience wasting, limiting growth and cognitive ability, conditions affecting 144 million and 47 million children under five, respectively.²⁰ Furthermore, FAO in 2013 estimated that the economic cost of undernutrition is up to US\$2.1 trillion.²¹

Climate change and environmental degradation add a significant threat.

The areas with inadequate access to WASH coinciding with those that will face climate-related water stress in the coming 20-30 years.²² For example, in Sub-Saharan Africa urban population growth will increase the urban domestic water demand as much as 650 – 1,300 per cent by 2050, exacerbating significantly supply challenges.²³

Finally, a key consideration is how incomplete or incorrect knowledge guides the health approaches for cities and informs the questions that are subject of research. This is a productive consideration, particularly as the way cities provide for health is reinvented in the wake of inequality, climate change, and pandemics. Today, growing cities worldwide and particularly in LMICs find existing WASH solutions prohibitively expensive, sentencing millions to death and disease. More investment and creative approaches and last mile measures to ensuring safe water access are urgently needed.²⁴

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1.2 Cities provide for health through urban planning and design

Key Messages:

Cities contribute significantly to improving health outcomes through planning and design for public safety, social interaction, physical activity and a healthy diet. Cities can significantly mitigate for social isolation and poor physical and mental health through urban planning and design that accounts for the need of the poor "8-80".

Green space and neighbourhood quality and design contribute to healthy lives.

Cities globally care for people's health and wellbeing through planning and

design that promotes physical activity, social and mental wellbeing and healthy diets. Effective land use mix, density and greenspace can provide accessible, safe and attractive spaces for healthy lives and ultimately the possibility of social networks. The "8-80" principle was pioneered by Danish architect and psychologist Jan and Ingrid Gehl in the 1960's and coined by Colombian Mayor Gil Peñalosa.²⁵ Urban areas must be safe and enjoyable for those under the ages of 8 and over the age of 80. Upon further inspection and as evidenced below, the principle should be: to build cities for the "poor 8-80".

A series of literature reviews, which together explore more than 2800 articles show the benefits of green space in urban areas to social interactions,²⁶ local economies,²⁷ reductions in crime and improvements in public safety,²⁸ active living,²⁹ reduced risk from toxins and pollution,³⁰ reduced stress and contributions to mental health.³¹ Similarly, a systematic review that aimed to clarify the impact of the neighbourhood design on health and wellbeing found that there are important associations between neighbourhood design principles such as walkability, access to green space and amenities and health and wellbeing.³² Broadly, neighbourhood walkability is

associated with a positive impact on mental health,³³ reduced incidence of hypertension,³⁴ diabetes,³⁵ lower risk of disability³⁶ and reduced air pollution.³⁷

Moreover, local improvements through lighting and safety initiatives can reduce the fear of crime³⁸ and lead to increased levels of walking.³⁹ Studies show that contact with nature reduces stress levels^{40 41} and nature walks are associated with improvement in mental health and well-being. Studies even suggest that people are happiest in nature⁴² and that contact with nature can lead to the valuing of and generosity toward others.⁴³

The value and importance of close contact with nature is now widely accepted and has led to the development of the biophilic cities movement. Biophilia is defined as "the innately emotional affiliation of human beings to other living organisms",44 or, in other words, the predispositions to preferring those characteristics of our environment that have helped with our survival such as the widevista landscapes and refuges (caves for shelter, or water and coastal environments).⁴⁵ Urban areas that offer natural elements and provide opportunities for frequent contact contribute significantly to health and wellbeing.46

Cities, designed to promote access to fresh and affordable food, care for health.

Equally, cities contribute to food security, including availability and access to fresh affordable food.

Effective cities strengthen city-region food systems, support localized food systems and strengthen linkages with rural producers.⁴⁷ Urban agriculture, defined as the growing, processing, and distribution of food products in and around cities,⁴⁸ together with the legislation and regulation of land use practices, zoning, transportation is likely to have health and economic benefits.⁴⁹ 25. 8-80 Cities, "8-80 Cities," Website, 2022, https:// www.880cities.org.

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49. World Health Organization, "Global Report on Urban Health: Equitable, Healthier Cities for Sustainable Development," 2016, http://www.who.int/ about/licensing/copy-right_form/index.html. Additionally, cities can promote urban agriculture through cross-sectoral action, the generation of local, national and international partnerships, the provision of technical support and others, creating enabling environments for food security and income for vulnerable groups. One example is from **Quito (Ecuador)** a group called Quito's Participatory Agriculture Project (AGRUPAR) constituted in 2002 and currently in operation under the Quito Municipalities' Agency for Economic Promotion (ConQuito).⁵⁰ In 2019, after 17 years of operation low-income groups had benefited through consumption and sales of 1,200 kg of food from 4,400 gardens covering 40 hectares.⁵¹ Yearly, the sales from the food generates US \$350,000 resulting in participants having experienced an increase in yearly income of US\$2100. This is significant, the average total yearly income of participants is US \$3,100. More recently, the project Sustainable Food Production for a Resilient Rosario, by the municipality of **Rosario (Argentina)** received a first place in the WRI Prize for Cities for creating significant, positive, lasting change.⁵²

City planning and design fall short of providing for urban health. Many urban areas can contribute to social isolation, poorer physical and mental health, particularly for the poor.

In the absence of adequate planning and design, urban densification may be associated with increased social isolation and poorer physical and mental health.⁵³ Similarly,

neighbourhood deprivation is associated with poorer health⁵⁴ and poor neighbourhood conditions with functional loss.⁵⁵ ⁵⁶ In parallel, rapid urbanization and population growth are taxing the global food system through requiring increases in agricultural production, while contributing to environmental degradation, climate change and extreme weather events ultimately accelerating malnutrition, including hunger, undernutrition and over-nutrition.57 Urban areas and lifestyles are linked with decreases in physical activity⁵⁸ and an increase in the consumption of refined carbohydrates, food higher in fat, more animal products, more sugar and more processed or non home-cooked foods.⁵⁹ Urban living can result in unhealthy diets due to the lack of access to affordable healthy food from the loss of agricultural land as well as to the proliferation of fast, cheap, low caloric or nutritious alternatives.⁶⁰

Poor diets and decreased levels of physical activity have been associated with increases in body mass index, overweight and waist circumference.⁶¹ A study of 195 countries worldwide found that in 2017, 11 million deaths and 255 million Disability Adjusted Life years (DALYs) were attributable to dietary risk factors.⁶² Additionally, physical inactivity, unhealthy diets, harmful use of alcohol and tobacco use are known risk factors that contribute to a large percentage of non-communicable diseases (NCDs). Globally, by 2030 and 2060 NCDs are expected to cause 77 per cent and 82 per cent of deaths, respectively.⁶³ By 2030, NCDs are projected to result in 48.8 per cent and 87.8 per cent of deaths in high and low-income countries, respectively.⁶⁴ Simultaneously, among children under 5 years of age, 149.0 million are stunted, 49.5 million are wasted and 40.1 million are overweight and there are 667.6 million obese adults, as per the 2020 Global Nutrition Report.⁶⁵ These figures are disaggregated in Country Nutrition Profiles online.⁶⁶ The urban poor remain the most affected with significant intra-city differences in health outcomes.

A majority of the available literature that draws links between specific aspects of the urban environment and health are from high-income countries. The applicability of the findings in LMICs is difficult to evaluate precisely. Section 2 will discuss health inequalities within and across low to high income countries and the roles of urban stakeholders. Section 3 outlines innovative and evidence-based ways of intervening. 50. Sarah Stolar, "AGRUPAR: Urban Agriculture in Quito, Ecuador," *Borgetn Magazine* (Chanhassen, Minnesota, October 2021), https://www.borgenmagazine.com/ urban-agriculture-in-quito/.

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1.3 Provide for health through urban mobility, public and non-motorized transport

Key messages:

► As new transport technologies emerge in urban agglomerations, cities have a critical role in mediating their productive, fair and equitable introduction into city-life.

► The urban domain can present significant risks to urban dwellers from exposure of traffic accidents and air pollution but cities can minimize those risks.

Urban agglomerations have been centers for innovation and the sites where solutions and problems affecting health are generated in

equal measure. The urban movement of people and goods continues to be both a barrier and an enabler to further economic, cultural, social and environmental prosperity. Consequently, urban mobility also underpins health outcomes, which are dependent on and contributors to prosperity.

Historically, improvements in the speed and quality of mobility have relied on technological innovations. These innovations have allowed urban dwellers to move longer distances during the 30 minutes they are willing to commute, each way between home and work, as per the idea known as the Marchetti Constant.⁶⁷ For example, beginning in the 1880s the invention of bicycles and electric streetcars made it possible to travel within a given urban agglomeration faster than ever before. As result, walkable agglomerations, which were approximately 3 kilometres in diameter and covered 8 square kilometres such as Rome in 275 CE/ AD or Paris in 1383, expanded to agglomerations covering 130 square kilometres, such as Chicago in 1915.68 Upon the emergence of new transport technologies, from the bicycle to municipal E-hailing apps which match riders with drivers, cities have had the opportunity to "care" for people by facilitating a fair, effective and ultimately healthy uptake.

Box 1: The Copenhagen bicycle

The emergence of the bicycle as a viable option for transport in Copenhagen in the late 1880s illustrates the role of cities and gives important lessons. Today, **Copenhagen (Denmark)** is hailed as the world's most bike-friendly city but there was a time when the bike was a novelty. Emanuel's account indicates that in 1897 one in ten inhabitants owned a bicycle and by 1911, 15 per cent of men and 11 per cent of women cycled to work.⁶⁹

In an effort to move longer distances faster, the bicycle was used and alongside innovative solutions to the lack of adequate biking infrastructure. With use, the edge of horse tracks became smooth and improved the quality of bike travel. Initially, city authorities cut up these smoothed out paths to signal that tracks were to be used by horsemen. By 1891 the paths were left untouched and subsequently became the first official municipal bicycle lanes. In 1895, intense disputes between cyclists and horsemen, resulted in debates in council on the fate of the tracks and their use, culminating in cyclists being permitted their continued use.

The city council acted as mediators and eventually supported cyclists, while raising concerns and implementing measures to minimize risk to pedestrians and discouraging cyclist misbehaviour. The bicycle network of Copenhagen was developed through constructive dialogue between the city and the Bicycle Lane Association, founded in 1897.The city considered the merits and disadvantages of the new technology, leveraging the former and mitigating for the latter.

67. Cesare Marchetti, "Anthropological Invariants in Travel Behavior," *Elsevier Science - Technological Forecasting and Social Change* 47 (1994): 75–88, http://www. cesaremarchetti.org/archive/electronic/ basic_instincts.pdf.

68. Jonathan English, "The Commuting Principle That Shaped Urban History," Bloomberg CityLab, 2019, https://www. bloomberg.com/news/features/2019-08-29/ the-commuting-principle-that-shapedurban-history.

69. Martin Emanuel, "Making a Bicycle City: Infrastructure and Cycling in Copenhagen since 1880," *Urban History* 46, no. 3 (2019): 493–517, https://doi.org/10.1017/ S0963926818000573. Shaping the way urban technologies are introduced is a task for city experts and policymakers working collaboratively with residents and, in this case, road users who influence the process of infrastructure provision through their practices and direct interventions. **Cities care for people best when they mediate the introduction of** technology, while accounting for externalities and competing interests, in close collaboration with residents, aiming to ensure that everybody benefits from the innovation. Cities have come a long way, today they move up to 37 million people as is the case of Tokyo, a feat that was unimaginable just 50 years ago.

Cities care for people through creating the conditions for active, safe and non-polluting forms of urban transport.

Physical inactivity is a serious risk factor for non-communicable diseases, which represent a major cause of morbidity and mortality worldwide as highlighted in Section 1.2. A systematic review of the available literature on health impact assessment of active transport (AT), such as walking and cycling for transportation, concludes that the net benefits of AT are substantial in the high income countries where the majority of studies were from.⁷⁰ The projected health benefits from physical activity significantly outweigh the detrimental effects of traffic incidents and air pollution exposure.⁷¹ Studies are most common in the 'Global North' whereas they are less evidence-based and more limited in LMICs.

The ability of cities worldwide to manage transportation technology transitions fairly remains ongoing. Urban agglomerations continue to be dangerous places, including from road-traffic accidents and exposure to ambient air pollution.

Box 2: Preventable deaths from air pollution, noise, heat and green spaces in Barcelona

A study⁷² of **Barcelona (Spain)** estimated the preventable noise, heat and access to green urban transport planning would address a considerable share out physical activity (1577) and years of age is 600 MET min/week, the equivalent of approximately 150 minutes a week of brisk The provision of safe, accessible, where the burden of mortality from air pollution, noise and

70. Natalie Mueller et al., "Urban and Transport Planning Related Exposures and Mortality: A Health Impact Assessment for Cities," *Environmental Health Perspectives* 125, no. 1 (2017): 89–96, https://doi. org/10.1289/EHP220.

71. Natalie Mueller et al., "Health Impact Assessment of Active Transportation: A Systematic Review," *Preventive Medicine* 76 (2015): 103–14, https://doi.org/10.1016/j. ypmed.2015.04.010.

72. Mueller et al., "Urban and Transport Planning Related Exposures and Mortality: A Health Impact Assessment for Cities."

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Mortality and injury from road traffic accidents are a leading cause of death globally, mostly in low-and middle-income settings, where the least is known about the drivers of urban accidents.

Globally, it is projected that in 2016 road injury accounted for 2.5 per cent (1,402,000) of all deaths. This figure was 3.6 per cent (194,000) and 0.9 per cent (94,000) in low-income and high-income countries, respectively.⁷³ Projections show that by 2030, while the share of yearly deaths from road injury is expected to decrease, both globally (2.2 per cent) and in high income countries (0.6 per cent), it will increase in lowincome countries (5.1 per cent or 315,000 deaths).⁷⁴ Importantly, in 2002 it was estimated that 50 per cent of fatal road accidents and 75 per cent of road traffic-related injuries took place in urban areas.⁷⁵

Road accidents represent the leading cause of death for young people between the ages of 5 and 29 worldwide.⁷⁶ Of the aforementioned deaths, vulnerable road users, including riders of motorized 2-3 wheelers, cyclists and pedestrians make up the group that is the most affected (See Figure 5). Ironically, it is those who contribute the least to carbon emissions and choose the healthier transportation alternatives that are most at risk. Healthy commuters are more at risk in the African and Eastern Mediterranean regions, where 44 per cent and 35 per cent, respectively, of deaths are among pedestrians and cyclists. Globally, pedestrians and cyclists make up 26 per

cent of deaths. Notedly, 50 million more people suffer non-fatal road injuries and associated financial implications each year.⁷⁷

Importantly, people are more safe from dying from road traffic accidents in urban areas, despite that they are more likely to get into minor accidents.^{79 80 81} One study in a high-income setting, London and Whales, found that accidents increased with population size and faster for lower levels of severity.⁸² The number of minor accidents grew faster than proportionally with population size. It is unclear if these findings extend to LMIC contexts.

The reason severe urban accidents are less frequent in urban areas is likely to be lower urban speeds and the adherence to laws that limit known behavioural risk factors.⁸³ Risk factors such as speeding, drunk-driving and not using seat-belts, helmets and child restraints. Other possible reasons include the quality of infrastructure. availability of emergency care and the types of urban crashes, such as rear-end collisions, instead of head-on collisions and collisions with stationary objects.⁸⁴ Cities provide for health in the way they build roads and signage as well as enforce relevant regulations.

73. World Health Organization, "Health Statistics and Information Systems."

74. World Health Organization

75. Philipp Rode et al., "Accessibility in Cities: Transport and Urban Form," no. November (2017): 239–73, https://doi. org/10.1007/978-3-319-51602-8_15.

76. World Health Organization, "Global Status Report on Road Safety 2018" (Geneva, 2018), https://www.google. com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjXiL-68pKbwAhWXTxUIHXLcCc80EfjAMegQIAxAD&url=https%3A%2F%2Fapps.who. int%2Firis%2Frest%2Fbitstreams%-2F1164010%2Frest%2Fbitstreams%-2F1164010%2Frestwe&usg=AOv/aw1-xxr--7UFsmdq0AebtF5_.

77. World Health Organization.

78. World Health Organization.

79. C. Zwerling et al., "Fatal Motor Vehicle Crashes in Rural and Urban Areas: Decomposing Rates into Contributing Factors," *Injury Prevention* 11, no. 1 (2005): 24–28, https://doi.org/10.1136/ ip.2004.005959.

80. Lawrence H. Brown, Ankush Khanna, and Richard C. Hunt, "Rural vs Urban Motor Vehicle Crash Death Rates: 20 Years of FARS Data," *Prehospital Emergency Care* 4, no. 1 (2000): 7–13, https://doi. org/10.1080/10903120090941551.

81. C. Cabrera-Arnau, R. Prieto Curiel, and S. R. Bishop, "Uncovering the Behaviour of Road Accidents in Urban Areas," *Royal Society Open Science* 7, no. 4 (2020), https:// doi.org/10.1098/rsos.191739.

82. Cabrera-Arnau, Curiel, and Bishop.

83. World Health Organization, "Global Status Report on Road Safety 2018."

84. Zwerling et al., "Fatal Motor Vehicle Crashes in Rural and Urban Areas: Decomposing Rates into Contributing Factors."



Globally urban dwellers are exposed to outdoor air pollution that harms their health.

A recent review of the health impacts of air pollution⁸⁵ shows that **long-term** exposure to outdoor air pollution causes cancer and is harmful to the neurological, reproductive and respiratory systems. Long-term exposure is also associated with psychological complications, autism, retinopathy, foetal growth and low birth weight. Since the primary cause of air pollution is road emissions, urban dwellers are the most affected.⁸⁶ A 2016 WHO Report⁸⁷ on air pollution exposure and burden of disease showed 80 per cent of people living in urban areas are exposed to air quality levels that exceed the recommended limits. The exposure

varies by level of country income, where 98 per cent and 56 per cent of cities with more than 100 000 inhabitants in LMICs and in high-income countries, respectively, exceed healthy limits (See: Figure 6) Globally, 3 million deaths were attributable to ambient air pollution in 2012, of which 87 per cent occurred in LMICs.⁸⁸ (See: Figure 7) The death toll is similar to the total number of reported deaths from COVID-19 (3.29 million) by May 2021 but the toll is projected to be increasing and takes place yearly.⁸⁹ By 2060, the economic cost of air pollution from medical bills, sick days and reduced agricultural output is projected to be 1% of global GDP or USD 5 2.6 trillion, annually.⁹⁰



Afr: Africa ; Amr: Americas ; Emr: Eastern Mediterranean, Eur: Europe ; Sear. South-East Asia ; Wpr: Western Paoific; LMIC: low- and micdle-income countries; HIC: high-income countries ; AQG; WHO Air Quality Guidelines. *Annual mean PM_m: 20 μg/m³; Annual mean PM_{2n}; 10 μg/m³.

 4 For town and cities with both PM $_{\rm in}$ and PM $_{\rm 25}$ values, PM $_{\rm 25}$ were used.

Figure 6 Annual mean particulate matter concentration of the assessed towns and cities, compared to the WHO Air Quality Guidelines

[Page 28]⁹¹ (AQG is WHO Air Quality Guidelines]



AAP: ambient air pollution; Afr: Africa; Amr: Americas; Emr: Eastern Mediterranean; Eur: Europe; Sear: South-East Asia; Wpr: Western Pacific; LMIC: Low- and middle-income countries; HIC: High-income countries

Figure 7 Deaths attributable to APP in 2012, by disease and region Source: Ambient air pollution: A global assessment of exposure and burden of disease (Page 41) (Note:COPD is Coronary Obstructive Pulmonary Disease; IHD is Ischemic Heart Disease; Acute lowerrespiratory infections)⁹² 85. Ioannis Manisalidis et al., "Environmental and Health Impacts of Air Pollution: A Review," Frontiers in Public Health 8, no. February (2020): 1–13, https:// doi.org/10.3389/fpubh.2020.00014.

86. Manisalidis et al.

87. World Health Organization, "Ambient Air Pollution: A Global Assessment of Exposure and Burden of Disease" (Geneva, 2016), https://apps.who.int/iris/bitstream/ handle/10665/250141/9789241511353-eng. pdf?sequence=1.

88. Organization.

89. Johns Hopkins University of Medicine, "Coronavirus Resource Center," COVID-19 Dashboard by the Center for Systems Science and Engineering at Johns Hopkins, 2021, https://coronavirus.jhu.edu/map.html.

90. OECD, "The Economic Consequences of Outdoor Air Pollution" (Paris, 2016), https:// www.oecd-ilibrary.org/environment/theeconomic-consequences-of-outdoor-airpollution_9789264257474-en.

91. Organization, "Ambient Air Pollution: A Global Assessment of Exposure and Burden of Disease."

92. Organization.

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VI Working Paper #16

2. Challenges to consolidating a healthy City. If cities can care for people, what impedes healthy urban lives?

2.1 Understanding social and economic factors resulting in urban health inequities

Key Messages:

 City life is shaped and shapes health at the intersection of social and environmental determinants of health like WASH, urban planning and design and transport.
 Social and environmental determinants of health are unevenly and unfairly distributed among urban populations. ► Urban agglomerations are places where people are born, grow, work, play, live and age in ways that make them healthy or sick, depending on what they are where they

depending on who they are, where they come from, and how much money they have.

Cities can better understand and address the drivers of health inequalities by prioritizing the analysis of determinants of health and health outcomes disaggregated by

vulnerable groups

and spatially.

Urban determinants of health

Urban social determinants of health can be understood as the nonmedical factors that affect health outcomes that are particular to life

in urban areas. These factors include the important ways that cities can provide for health described in Section 1 and others such as public safety, education, and social services. The resulting environments can affect health directly as described in the section on pollution or road traffic accidents. They also influence individual behaviours. For example, a literature review⁹³ to determine predictive factors for illicit drug use among young people in the United Kingdom found that a risk factor for drug use is the availability of drugs in school. Similar conclusions were noted above about the proximity to green space making the performance of physical exercise more likely.

There are other factors the literature shows which fundamentally affect health, including income and wealth, social protection, education, unemployment and job security, working life conditions, food insecurity, access to affordable health services and commercial interests.^{94 95 96} Each of these are interconnected in cities through policies, practices, systems and sectors, as well as through their impact on communities.⁹⁷ For example, insufficient WASH leads to disease, which impairs cognitive development, affecting educational attainment and future employability, which in turn further affects health.

Similarly, unchecked commercial interests that flood urban environments with market practices and advertising, influencing the state and society, are associated with the rise of non-communicable diseases (NCDs). Advertisements of inexpensive processed foods filled with harmful additives, excessive amounts of salt, sugar, and calories become easy alternatives for a guick meal and create pseudo-addictions to consuming more. Although some estimates indicate that the physical environment contributes to 10 per cent of health outcomes, they are also tied to social and economic factors. which contribute to up to 50 per cent of health outcomes (See: Figure 8 and Figure 9).^{98 99} Figure 6 shows the health factors that influence health outcomes. and spatially.

Figure 8 Estimates of the contribution of the main determinants of health outcomes Source: King's Fund (2012): Social Determinants of Health Equity¹⁰⁰



94. Rachel A. Davis et al., "Countering the Production of Health Inequities: A Framework of Emerging Systems to Achieve an Equitable Culture of Health," 2016, 66, https://www.google.com/ url?sa=t&rct=j&q=&src=s&source=web&cd=&ved=ZahUKEwizhpXH9fDvAhW4hP0HHQySC240FjAAegQlAxAD&url=https%3A%2F%2Fwww.preventioninstitute. org%2Fdownload%2Fpi_publication%2Fnode-field_download_files-1855-0&usg=A0v-Vaw26RXbs3XejsctHm6Y23gLB.

95. Paula Braveman and Laura Gottlieb, "The Social Determinants of Health: It's Time to Consider the Causes of the Causes," *Public Health Reports* 129, no. SUPPL. 2 (2014): 19–31, https://doi. org/10.1177/00333549141291s206.

96. M. Marmot and R. Bell, "Fair Society, Healthy Lives (Full Report)," *Public Health* 126, no. SUPPL.1 (2012): S4–10, http://dx.doi. org/10.1016/j.puhe.2012.05.014.

97. Davis et al., "Countering the Production of Health Inequities: A Framework of Emerging Systems to Achieve an Equitable Culture of Health."

98. The King's Fund, "Broader Determinants of Health: Future Trends," Time to Think Differently, 2012, https://www.kingsfund.org. uk/projects/time-think-differently/trendsbroader-determinants-health.

99. Patrick L. Remington, Bridget B. Catlin, and Keith P. Gennuso, "The County Health Rankings: Rationale and Methods," *Population Health Metrics* 13, no. 1 (2015): 1–12, https://doi.org/10.1186/s12963-015-0044-2.

100. Michael Marmot and Jessica J. Allen, "Social Determinants of Health Equity," *American Journal of Public Health* 104, no. SUPPL. 4 (2014): 517–19, https://doi. org/10.2105/AJPH.2014.302200.



Canadian Institute of Advanced Research (2012)





The causal pathways to urban health remain elusive with implications for policymaking and practice.

Evidence of linkages between determinants and health outcomes is often from cross-sectional analyses, and the pathways can be unclear. For example, a robust literature links education to health, with higher levels of educational attainment being associated with good health.¹⁰² ¹⁰³ However, causality remains contested. Do higher levels of education cause better health or the other way around? Similarly, stressors such as crime, living conditions and hunger limit educational attainment. Furthermore, the evaluation of the efficacy of interventions, such as changes to the physical environment, is challenging. **One barrier to** evaluation is the length of time it takes to observe outcomes, making it exceedingly difficult to draw causal pathways.¹⁰⁴

It is at the intersection of these factors that city life is simultaneously shaped and shapes human health. Changes to any part of the system affects others and the more science uncovers associations between health and parts of urban systems, the more remains unknown.

> 101. Remington, Catlin, and Gennuso, "The County Health Rankings: Rationale and Methods."

102. D P. Baker et al., "The Education Effect on Population Health: A Reassessment," *Popul Dev Rev* 37, no. 2 (2011): 307-32, https://doi.org/10.1111/j.1728-4457.2011.00412.x.

103. Michael Grossman, "THE RELATIONSHIP BETWEEN HEALTH AND SCHOOLING: WHAT'S NEW?" (Cambridge, MA, 2015), https://www.nber.org/system/ files/working_papers/w21609/w21609.pdf.

104. Braveman and Gottlieb, "The Social Determinants of Health: It's Time to Consider the Causes of the Causes."

Urban health should be evaluated across groups that are disadvantaged to work effectively toward a fairer distribution of health.

Importantly, the factors that determine health are unevenly distributed among populations within cities, resulting in health inequities.¹⁰⁵

¹⁰⁶ Health inequities are known in a robust public health literature as the "systematic differences in the opportunities people have to achieve optimal health, leading to unfair and avoidable differences in health outcomes".¹⁰⁷ There are therefore ethical and human rights implications of addressing health in urban areas. Systematic but avoidable differences in health are common globally among disadvantaged groups according to race, religion, nationality, socioeconomic resources or position, gender, sexual orientation, age, geography, disability, and others.¹⁰⁸ Urban areas often exacerbate conditions of discrimination and marginalization and cities have an important role to play.

Cities-led initiatives should result in providing fairer opportunities to attain full health potentials and in not disadvantaging anyone from achieving this potential, if it can be avoided.¹⁰⁹ ¹¹⁰

¹¹¹ The extent to which a city provides for health should therefore be understood and evaluated across grouped individuals by sex, geographic location, ethnicity, age, income, illness, disability and others. A "grouped" and spatiallydisaggregated understanding of health outcomes helps cities understand how their initiatives contribute to health for all. For example, in Dhaka, Bangladesh maternal healthcare use between 2006 and 2013 was higher in informal settlements than in high-class areas but maternal health outcomes remained poorer in the former.¹¹² Similarly, differences between population groups could help determine necessary interventions in urban areas. For example, a study showed that between 2003 and 2005, 56 per cent of veterans in Los Angeles were chronically homeless and 46 per cent of homeless veterans were African American.¹¹³

Structures and biases together with socioeconomic and political drivers influence the decisions made in urban areas by those affecting change and generate health inequities. One systematic review of the health impacts on transportation, for example, found that few academic studies explored intervention using stratified analyses which limited the available insights on health inequities by socioeconomic status, race and gender.¹¹⁴ Understanding the specific drivers that result in groups becoming disadvantaged when compared to other groups becomes an essential part of achieving urban health. Effective and thorough urban health diagnosis is important to generateing solutions. Local drivers of change will be as different as any given city and neighbourhood is from the one another. Section 3 describes a novel framework for diagnosing complexity in cities called **PEAK** Urban, one that leverages the sciences of Prediction, the phenomenon of Emergence, the Adaptation of technology and the different ways of Knowing.

2.2 Challenges for cities in urban governance

Key Messages:

Cities face important challenges to participate in urban governance effectively including: limitations in capacity; insufficient and inadequate revenue; accountability and transparency; competing local interests; and urban complexity.

This section highlights challenges cities face in urban governance. Section 3.2 acts as a "response" to these challenges, identifying good practices in governance from cities' response to the COVID-19 pandemic. Urban health is often reduced to a set of metrics, aggregated indicators of performance. Indicators of

determinants of health are coverage of potable water services or levels of pollution. Examples of indicators of health outcomes are maternal mortality or non-communicable diseases. The required changes to affect those indicators lie in multiple urban systems. Furthermore, the required changes of systems for changing health metrics are specific to each city block and neighbourhood. Cities of different sizes, income levels, geographic locations 105. Un-Habitat and WHO, "Hidden Cities: Unmasking and Overcoming Health Inequities in Urban Settings" (Geneva, 2010), https://www.who.int/publications/i/ item/9789241548038.

106. World Health Organization, "Global Report on Urban Health: Equitable, Healthier Cities for Sustainable Development."

107. James N. Weinstein et al., *Communities in Action: Pathways to Health Equity, Communities in Action: Pathways to Health Equity* (National Academy of Sciences, 2017), https://doi.org/10.17226/24624.

108. Paula A. Braveman et al., "Health Disparities and Health Equity: The Issue Is Justice," *American Journal of Public Health* 101, no. SUPPL. 1 (2011): 149–55, https://doi. org/10.2105/AJPH.2010.300062.

109. Paula Braveman, "Health Disparities and Health Equity: Concepts and Measurement," *Annual Review of Public Health* 27 (2006): 167–94, https://doi.org/10.1146/annurev. publhealth.27.021405.102103.

110. M Whitehead and G Dahlgren, "Concepts and Principles for Tackling Social Inequities in Health: Levelling up Part 2," 2007.

111. Marmot and Allen, "Social Determinants of Health Equity."

112. Gustavo Angeles et al., "Reducing Inequity in Urban Health: Have the Intra-Urban Differentials in Reproductive Health Service Utilization and Child Nutritional Outcome Narrowed in Bangladesh?," *Journal of Urban Health* 96, no. 2 (2019): 193–207, https://doi.org/10.1007/s11524-018-0307-x.

113. Weinstein et al., *Communities in Action: Pathways to Health Equity.*

114. Ivana Stankov et al., "A Systematic Review of Empirical and Simulation Studies Evaluating the Health Impact of Transportation Interventions," *Environmental Research* 186, no. April (2020): 109519, https://doi.org/10.1016/j.envres.2020.109519. face challenges in contributing to human health specific to their own contexts around issues related to capacity, funding, accountability and competing local interests. Of course, not everything that is important can be quantified. Even in high-income countries information systems fail to gather evidence on psychosocial, quality of life outcomes and poorly harmonizse and connect information gathered across sectors. Section 3.2 gathers lesson from governance during COVID-19 and highlights the value of a whole of society approach to address this challenge.

Cities deliver services which are highly technical and require significant expertise. Distinct expertise

is required across the range of cityled services including infrastructure, WASH, planning, economic development, tourism, education, social care and many others. Attracting and retaining talent can be challenging, particularly in small and mediumsized cities that may not meet the preferences of professionals.

Limited, variable, siloed and undiversified revenue streams can be a major factor preventing cities to deliver on health. Globally, the

revenue sources of cities are varied but they often include income from services, local taxes and nationalgovernment transfers. Often, fees from services are insufficient to cover costs. Also, transfers from national governments come with powers or responsibilities over providing certain services but the cost of service provision does not always match amounts transferred. Similarly, often there is limited and varied scope internationally for accessing loans for major infrastructure projects. This leaves cities un-protected in the case of unforeseen events. Finally, budget siloes by sector and financial accountability procedures act as barriers to cross sectoral planning. During the ongoing COVID-19 pandemic, cities have struggled to meet rising demand in services since income generated by activities such as tourism and the use of local services have diminished.

Accountability and transparency can be a factor affecting cities' performance. The issue can stem from malfeasance in use of public

funds or inadequate communications mechanisms to demonstrate how funding is allocated and to inform and get citizen input.

Competing local interests, priorities and objectives are exacerbated by limited funding and place cities in difficult positions. For example, the official position of Thames Water of **Oxfordshire**, United Kingdom - one of the most famous high-income cities in the world - is that discharging wastewater into local watercourses is unacceptable since rivers should be natural places for recreation, relaxation and inspiration. However Oxfordshire's Thames Water continues to release sewage into rivers regularly.¹¹⁵ Currently a £114 million project is underway to increase sewage treatment and storage capacity to better protect rivers and human health. Furthermore, the Thames Tideway Tunnel a £4.9 Billion 15-mile-long sewer is currently being built. The infrastructure aims to capture the sewage overflowing into local rivers from London's overloaded Victorian sewer system. The cost of this infrastructure is simply prohibitive in many LMIC cities.

Urban planning for health and wellbeing presupposes that health is given priority over other competing demands. Health becomes a chief aim and shapes local decisions in service provision, procurement, collaboration, and even income generation across urban systems. For example, municipalities can choose to reject income from advertisement in billboards that litter public space, marketing processed foods or beverages with no nutritional value that contribute to NCDs. The difficulty is when the lack of those funds limits a city's ability to provide life-saving services.

Cities face complex and wicked problems in urban areas. The

approach of treating urban areas as laboratories or machines, where any part can be studied or changed apart from the complex whole is problematic. This approach can lead to focusing on one disease, unhealthy behaviour or design change at a time and expecting that fixing one part of the machine will make the other parts come together to improve health.¹¹⁶ A similar approach is to incorporate health considerations into the agendas

115. Thames Water, "River Health," 2021, https://www.thameswater.co.uk/about-us/performance/river-health.

116. Jason Corburn, "Healthy City Planning: From Neighbourhood to National Health Equity," *Healthy City Planning: From Neighbourhood to National Health Equity*, 2013, 1–182, https://doi. org/10.4324/9780203772249. of non-health stakeholders or sectors. Isolated interventions by non-health sectors can, with a health justification, implement initiatives with unintended consequences.¹¹⁷ For example, in part to improve local health the city of **Milwaukee, WI (United States)** partnered with non-profit organizations and businesses to convert 900 foreclosed homes and 2700 vacant lots into gardens and urban agriculture as part of a greening programme. However, the foreclosed homes and lots were part of foreclosures affecting 16 000 homeowners who were unable to pay property taxes, which disproportionately affected black residents.¹¹⁸ These well-meaning single sector approaches ignore underlying drivers of health such as spatial and racial inequalities that generate or exacerbate negative health outcomes for some. The approaches often act "downstream", when acting "upstream" has been noted to be more effective in closing inequities. Instead, we propose a framework for understanding the city and principles for healthy city-building outlined in Section 3.

2.3 Case studies of health inequities highlighting the role of city-based stakeholders and barriers to equity

Key Messages:

Cities have a lot to gain from organizing into associations charged with advocacy and capacity building through leveraging resources of international and national organizations.

Effective cities find partners with technical expertise to strengthen their capacities to deliver holistic community-centred health-giving services such as WASH.

Cities are excellent convenors and coordinators of resources in benefit of their populations.

The provision of WASH in Guatemalan cities highlights factors contributing to the complexity of the sector, which vary significantly from state to state and from city to city – making no onesize-fits all solution possible.

In 2018, 51 per cent or approximately 8.2 million Guatemalans were estimated to live in urban areas.¹¹⁹ Guatemala is one of the most unequal countries worldwide, ranked 19th in 2014¹²⁰ and has the sixth highest rate of chronic malnutrition.¹²¹ As in many other LMICs, inequalities at the intra-urban level are illusive due to insufficient data and monitoring. The COVID-19 pandemic already led to the estimated contraction of the economy by 3 per cent in 2020 with one million people expected to fall into poverty.¹²²

In Guatemala, WASH is the shared responsibility of national and local

governments. The territory is divided into 22 departments, controlled by national government and 340 municipalities, managed by locally elected municipal councils. An assessment by the World Bank (2018)¹²³ highlights two main challenges in the provision of WASH related to accountability and capacity constraints. First, accountability is hindered by a series of factors. There is no one level of government fully responsible for providing WASH. While WASH services are the responsibility of municipalities, departments manage the design, construction and supervision of WASH systems. To further aggravate this, many municipalities contract service provision to private sector and the arrangements are not made in a way that the public have accurate information on coverage and quality of WASH services. Additionally, there is no adequate regulation of private sector providers and no alternatives given to citizens. Second, capacity constraints exist at all levels of government and are exacerbated by the technical and costly nature of the provision of WASH and the inability or reluctance to pay by communities.124

In this context, with the training, technical and financial support from international organizations, including CARE Guatemala, Helvetas, Millennium Water Alliance, FEMSA and others, three municipalities of the San Marcos Province, Guatemala established municipal WASH offices (OMAS for acronym in Spanish) between 2007 and 2011.¹²⁵ To date, and with the added involvement of governmental 117. Helen Cole et al., "Can Healthy Cities Be Made Really Healthy?," *The Lancet Public Health* 2, no. 9 (2017): e394–95, https://doi. org/10.1016/S2468-2667(17)30166-4.

118. Cole et al.

119. The World Bank, "Urban Population (% of Total Population) Guatemala," United Nations Population Division World Urbanization Prospects: 2018 Revision, n.d.

120. World Bank, "GINI Index [World Bank Estimate] - Country Ranking," Index Mundi, accessed May 10, 2021, https://www. indexmundi.com/facts/indicators/SI.POV. GINI/rankings.

121. World Bank, "The World Bank in Guatemala - Overview," 2020, https://www. worldbank.org/en/country/guatemala/ overview.

122. World Bank.

123. World Bank Group, "Guatemala's Water Supply, Sanitation, and Hygiene Poverty Diagnostic: Challenges and Opportunities" (Washington, DC, 2018), https://openknowledge.worldbank.org/ handle/10986/29454.

124. CARE Guatemala, "EXPERIENCES OF CARE GUATEMALA IN SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES AND ADAPTATION TO CLIMATE CHANGE IN THE WESTERN HIGHLANDS," 2018, https://www.carefrance.org/ressources/ themas/1/662ce4b-7592-CARE_Resumenn-Ejecutivo_vln.pdf.

125. Will Tillett, Angela Huston, and Susan Davis, "Strengthening Water, Sanitation, and Hygiene Systems: Concepts, Examples, and Experiences," 2020, https://www. washagendaforchange.org/wp-content/ uploads/2020/04/20200227_agenda_ for_change_systems_strengthening_ experiences_final.pdf. organizations such as an association of municipalities ADINAM (Associacion Desarrollo Integral de Municipalidades del Altiplano) and MANCUERNA, approximately 125 municipalities nationwide (37%) have set up an OMAS and currently form part of the National Network of Water and Hygiene (RASAGUA).¹²⁶

The effective running of OMAS has resulted in better governance and accountability in the provision of WASH and subsequently in improved coverage, service delivery and health.¹²⁷ The municipalities provide services directly operating and maintaining WASH services while collecting and monitoring data on the number of households, the population, the main water source, latrine coverage status, management and practices of the water committee, and tariffs changed.¹²⁸ Another important role of the municipal OMAS is to act as a convenor, coordinating the efforts of the municipality, community, public organizations, international cooperation institutions, civil society and others with a vested interest in the sector. The case shows that WASH provision is a building block of prosperity and a significant way in which cities can care for people's health with the right conditions and support. The gains have been despite a challenging national context of high levels of poverty, inequality and limited institutional capacity.

Other case studies provide invaluable context for policymakers and practitioners

Importantly, health systems are made up of many players in addition to cities. Experiences from the vantage point of those players are helpful in understanding and contextualizing the role of the city. Shaping Health¹²⁹ is a collaboration that aimed to summarize experiences of social power and participation in local health systems. The case studies provide deep and varied insight into the functioning of health systems with short case studies¹³⁰ from Canada, Ecuador, Australia, India, Lusaka Zambia, Vanuatu and deep scan case studies¹³¹ from Brazil, Chile, Kenya, New Zealand, Scotland and Slovenia. 126. Cristobal Perez Oxlaj, "I y II Encuentro Nacional de Oficinas Municipales de Agua y Saneamiento Guatemala," 2018, https:// thewashroom.waterforpeople.org/wpcontent/uploads/sites/2/2019/09/Encuentro-Nacional-de-OMAS-en-Guatemalaresumen-feb-2019.pdf.

127. Tillett, Huston, and Davis, "Strengthening Water, Sanitation, and Hygiene Systems: Concepts, Examples, and Experiences", Kelly Alexander, "Informe de Evaluación Proyecto Gobernabilidad Del Agua + Género," 2018, http:// careevaluations.org/wp-content/uploads/ Evaluación-Final_Iniciativa-Gobernabilidaddel-Agua-Género.pdf.

128. Asociacion Nacional de Municipalidades de la Republica de Guatemala, *Que Es La Oficina Municipal de Agua y Saneamiento OMAS* [Guatemala, 2019], https://www. youtube.com/watch?v=sZeKy_VvnNo.

129. Training Research and Support Centre, "Shaping Health," accessed May 28, 2021, https://www.shapinghealth.org.

130. Rene Loewenson and Sarah Simpson, "Experiences of Social Power and Participation Local Health Systems Volume 1 : Key Features of the Short Case Studies," 2017, https://www.tarsc.org/publications/ documents/SOCEMP Vol 2 deep case study summary.pdf.

131. Rene Loewenson, "Experiences of Social Power and Participation Local Health Systems Volume 2 : Key Features of the Deep Scan Case Studies," 2017, https:// www.tarsc.org/publications/documents/ SOCEMP Vol 2 deep case study summary. pdf.



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3. Approaches and action toward a "caring" city where everybody cares

The illustrative sectoral description of how cities contribute to health in Section 1 and the challenges in planning for healthy urban areas outlined in Section 2 highlight the need for a new way of approaching city-building in the 21st century.

This section presents the **PEAK Urban Framing** and considerations for good urban governance as ways forward in creating healthy cities and neighborhoods, as well as meeting SDGs that land in urban places, globally.

3.1 How to "see" past the complexity of cities – the PEAK Urban Framework

Key Messages:

Cities can leverage the PEAK framing to understand the dynamics of urban agglomerations better. The role of new tools, big data and prediction; the way that new forms of city life emerge; the uneven adoption of technologies; and the valorisation of different types of urban knowledge are critical to 'seeing' urban dynamics and intervening effectively.

► A more nuanced understanding of the city and its dynamics enables more effective action and hope for meeting SDG targets.

The PEAK Urban Framework as a new way to diagnose health of a city.

The PEAK Urban and Oxford Martin Informal Cities research programmes (hereinafter PEAK Urban) are comprised of more than 38 research projects conceptualized locally in Oxford, Beijing, Bangalore, Cape Town, Medellin, Delhi and Addis Ababa by researchers from varying epistemological dispositions with expertise in a range of disciplines from anthropology, medicine and mathematics to econometrics. Selected projects answer pressing questions in urban health, while using the PEAK Urban framing.

The projects value the power of (P) rediction and leverage opportunities of new data and tools. New datasets

and novel tools are used to interrogate existing paradigms and theories concerning how cities function. In areas of the Global South where administrative datasets may be scarce. new sources of information and data can be used to make visible some aspects of the working of large areas of informal settlement as we can see in cities in Latin America.¹³² ¹³³ Cities can access "big data" through mass transit and ride sharing infrastructures to predict behaviour over the short term.¹³⁴ ¹³⁵ Satellite imaging can be

combined with mortality data to assess health inequalities at a global scale.¹³⁶ At the same time, the limitations of prediction in systems that are open and unstable is recognized. New technologies now help cities to predict where urban growth will take place in the future, enabling the accurate provision of key services for health such as water, electricity, and others.¹³⁷ (E)mergence is premised on city systems rarely being in equilibrium. Cities have individual histories and particular geographies that create what are known as path dependencies in systems terms. Large areas of cities are built by the most excluded in sites that are occupied or squatted in situations of legal precarity and environmental insecurity and risk. Understanding the dynamics of such spaces demands working collaboratively with people on the ground to understand the ways in which new ways of dwelling in the city structure health outcomes, *emerge* from improvised responses to challenges of economic and social life.¹³⁸ Infrastructures and objects are appropriated in inventive innovations by people living in the city. New associational forms socially and new economic sectors such as self-build

132. Juan C. Duque et al., "Spatiotemporal Dynamics of Urban Growth in Latin American Cities: An Analysis Using Nighttime Light Imagery," *Landscape* and Urban Planning 191, no. August (2019). 10240. https://doi.org/10.1014/j. (2019): 103640, https://doi.org/10.1016/j. landurbplan.2019.103640; Jairo A. Gomez landurbplan.2019.103640; Jairo A. Gomez et al., "Towards a More Sustainable Urban Growth Through a Data-Driven Framework for Modelling, Planning and Control" (Medellin, 2020), https://www.peak-urban. org/sites/default/files/2020-06/peak-briefing_towards_a_more_sustainable_ urban_growth_15vi20_en.pdf.

133. Daniela Gonzalez et al., "Automatic Detection of Building Typology Using Deep Learning Methods on Street Level Images," *Building and Environment* 177, no. January (2020): 1–12, https://doi.org/10.1016/j. buildenv.2020.106805.

134. Pengjun Zhao and Peilin Li, "Rethinking the Determinants of Vehicle Kilometers Traveled (VKT) in an Auto-Dependent City. Transport Policies, Socioeconomic Factors and the Built Environment," *Transportation Planning and Technology* 44, no. 3 (2021): 273–302, https://doi.org/10.1080/03081060.2

135. ChengHe Guan and Michael Keith, "Spatialising Residential Neighbourhoods Using Big Urban Data," PEAK Urban Project, 2021

136. Samira Barzin and Neave O'Clery, "Measuring Urban Economies," The Oxford Martin Programme on Informal Cities Project Page, 2021; Samira Barzin and Neave O'Clery, "Pollution & Poverty," Oxford Martin Programme on Informal Cities, 2021.

137. Gomez et al., "Towards a More Sustainable Urban Growth Through a Data-Driven Framework for Modelling, Planning and Control.

138. Bani Gill, "African Migrants in India: Urban Space and Claim Making in Delhi," PEAK Urban Project, 2021; Bhawani Buswala and Michael Keith, "Experienceing the State: Informality, Social Inequality and Spatial Relations in Urban India, PEAK Urban Project, 2021, https:// peak-urban.org/project/experiencing-state-informality-social-inequality-an-spatial-relations-urban-india: Liza R. Cirolia, Nobukhosi Ngwenya, and Warren Smit, "Analysing Human Settlements Transformation in Cape Town," PEAK Urban Project, 2021, https://www.peak-urban org/project/analysing-human-settleme ettlements ransformation-cape-town; Edwar A. Claderon et al., "Urban Morphology of Displacement," PEAK Urban Project, 2021, https://www.peak-urban.org/project/urban-morphology-displacement.

self-organisation and community governance emerge, which facilitate and qualify public health interventions such as responses to the COVID-19 pandemic.¹³⁹ New infrastructures or innovative results come into the world or emerge through cities, captured by a sense of the "propensity of things". See Box 1: The Copenhagen Bicycle in Section 1.3 on Healthy Urban Transport.

Attaining an understanding of how new technologies land in place and are (A)dopted also shapes PEAK

projects. PEAK Urban recognises that the uptake, value and capture of technologies is vastly different between and even within cities. Exporting technologies from high-income countries to low-and middle-income countries and vice versa can result in varied, uneven and unintended consequences. For example, the transition to a cashless economy and the introduction of applications that match drivers to riders in India has had significant negative implications on poor micro-entrepreneurs, including the rickshaw industry.¹⁴⁰ Because the city as a whole works as a common pool resource or "commons", technological change disrupts the logics of public health interventions

in the city.¹⁴¹ Technological change disrupts the interfaces between different systems. For example, a small change in health technology such as adopting widespread use of defibrillators alters the interface between public health and transport systems in the city.¹⁴²

The configurations and pathways of (K) nowledge and power into and within the city are important to understand

the city. The range of ways of knowing the city and the multiplicity of potential solutions to urban dilemmas must be valorized adequately. Different forms of scientific knowledge land differently in different parts of the world.¹⁴³ Alongside the input of elected officials and appointed professionals, participatory processes have demonstrated the value of including civil society in decisionmaking processes. Trade-offs existing between the knowledge regimes within a city can result in sub-optimal interventions that focus on affecting parts of the city rather than the city as a whole. Balancing these trade-offs demands both an ability to see the city through different perspectives and scales and to mediate, evaluate and understand such trade-offs.

The PEAK Urban framing for city-based practitioners

The PEAK framing does not address a specific urban theme, dynamic or dilemma, rather it provides a way to interrogate any urban issue productively. For example, the liveability of urban places worldwide has been a matter of public interest for as long as they have existed. The extent to which a city promotes or endangers population health is an important aspect of its liveability and one that the PEAK Urban research programme is working to understand better. There is consensus that certain aspects of cities, including basic services such as sewerage systems, waste collection, provision of potable water, directly contribute to population health. While the known characteristics of cities that contribute to health are growing, they are also increasingly becoming more nuanced.

PEAK Urban Framework can enable the decisions made by local governments to account for the juxtaposition of urban scales, geographies and demands, more broadly, that have a direct and indirect impact on health. Local governments can use the framework to consider simultaneously the whole city and its constituent parts. (See appendix 1: PEAK Urban Framework for city-based practitioners)

The application of the framework of analysis has implications for high and low-income contexts. In the case of the former for example, exercises to (re)create the 15 minute city, that presupposes the disintegration of a whole (city) into 15-minute chunks, more amenable for activities that contribute to health, such as walking and social relationships. In the case of the latter, for example the logic leads to an integration of marginalized parts, namely informal settlements, to access amenities taken for granted by the rich, 139. PEAK Urban, "How PEAK Urban Is Responding to the COVID-19 Pandmic," PEAK Urban Blog, 2020, https://www. peak-urban.org/news/how-peak-urbanresponding-covid-19-pandemic.

140. Lucy Baker and Tim Schwanen, "Can India Create the Conditions for Micro Enterprises and Self-Employed to Go Cashless?" (Dxford, UK, 2021).

141. Michael Keith and Andreza Aruska de Souza Santos, "Introduction: Urban Transformation and Public Health in Future Cities," in *Urban Transformations and Public Health in the Emergent City*, ed. Michael Keith and Andreza Aruska de Souza Santos, 1st ed. (Manchester: Manchester University Presss, 2020), 1–30.

142. Keith and Aruska de Souza Santos.

143. Michael Keith, "Introduction and Conclusion," in *African Cities and Collaborative Futures Urban Platforms and Metropolitan Logistics*, ed. Michael Keith and Andreza Aruska de Souza Santos (Manchester University Press, 2021), 1–29 & 166–84, https://doi.org/https://doi. org/10.7765/9781526155351. but where their availability improves health (See Sections 1.1) Healthy neighbourhoods mean different things in different places and in different sectors that make up city life as we know it, including community services, education, health care. A caring city, seems to be one that is geographically flexible at the sub-city

level, one where wellbeing, which can be measured by health metrics. guides action rather than any given sector, scale or demand. There are implications for social participation structures and a disruptive role for technology, and another important role of local governments in creating the conditions for a caring city.

3.2 Urban governance for health.

Key Messages:

▶ The role of cities in urban governance is not homogeneous worldwide but it is always critical.

Public health concerns may impact on the city as a whole, events in marginal parts of the city can have impacts on the whole city as demonstrated by the COVID-19 pandemic.

Cities' participation in urban governance should be motivated by a proactive concern for health equity.

The central role of cities to facilitate the adoption and emergence of context specific equitable solutions should be supported and enabled through financial resources and technical support.

Urban COVID-19 is linked with poverty, availability of health services and housing, not density.

The investment of cities in empowering citizens and working in partnerships both vertical and horizontal is worth it and pays dividends during periods of high stress to urban systems.

Lessons for urban health governance from the COVID-19 pandemic

This section analyses urban governance for health by considering how the adherence to recommended best practices have helped cities respond to the ongoing COVID-19 pandemic. It draws lessons from governance "under stress" for preparing for the next health threat while accelerating improvements in population health outcomes. Effective urban governance for health has been the subject of significant debate and study. Importantly, in democratic societies, urban governance can be understood as the process of coordinating and steering urban society toward collectively defined goals.144 This raises questions of who is involved (and excluded) from the collective definition of the goals and how the process takes place.

Ultimately, cities have different devolved powers from states. Therefore, cities are essentially a different "type" of participant in urban governance according to their powers. For example, some cities have significant influence over social services, education, healthcare, housing while others have none at all. These powers can even vary radically between cities within the same country. Although the contribution cities can make to urban health is not homogeneous, cities remain a critical actor in urban governance alongside citizens, civil society, national government, international organizations, charities, business and others.

Guidance from international organizations

The World Health Organization and UN Habitat have recently summarized the evidence and lessons from best **practices**, making recommendations in flagship reports: Closing the gap in a generation – Health equity through action on the social determinants of health (2008).¹⁴⁵ Hidden Cities - Unmasking and overcoming health inequities in urban settings (2010),¹⁴⁶ Global Report on Urban Health - Equitable, healthier cities for sustainable development (2016).147 Health equity, the fair distribution of conditions for health and care across cities features as a guiding principle for effective governance. Relatedly, this principle guides the SDG 3 target of Universal Health Coverage (UHC), reaffirmed in the UN General Assembly High Level Meeting on UHC in 2019.148 ¹⁴⁹ UHC means that individuals and communities receive health services. including services in health promotion and disease prevention, treatment, rehabilitation and palliative care without financial hardship.¹⁵⁰ Cities play a direct and indirect role in UHC,

depending on their devolved powers and their involvement should be motivated by a proactive concern for health equity.

The reports¹⁵¹ ¹⁵² also describe prerequisites, mechanisms and areas for action of equity focused governance. Pre-requisites are political commitment to health for all; vision with a strong health dimension; institutional structures that are fit for purpose; and networks to promote collective action and innovation. Mechanisms include meaningful citizen participation, citizen empowerment through information sharing, publicprivate partnerships and intersectoral action. Recommended areas for action are to improve daily living conditions, tackle inequitable distribution of power, money and resources, and to measure ill health, assessing the impact of action. The adherence to these recommendations has enabled cities to mitigate for and react to the devastating effects of the ongoing COVID-19 pandemic to varying degrees.

The ugly urban face of the COVID-19 pandemic

Globally, as of May 2021, 3.4 million COVID-19 deaths have been reported officially with many remaining unreported.¹⁵³ The United States report 578,555 COVID-19 deaths but the estimated total number of COVID-19 deaths is 912,345.154 The disparity is even larger in other countries, for example, in India and Mexico, the reported numbers are 248,016 and 219,372, respectively, while the estimated totals are 736,811 and 621,962.¹⁵⁵ The shocking number of deaths are despite significant public health measures in almost every country to limit the spread of the virus. Measures that have included a combination of school and workplace closures, the cancelation of public events, restrictions on gatherings, closure of public transport, stay at home requirements, restrictions on internal movement and on international travel.¹⁵⁶ For example, 168 million children have had their schools closed for almost a year and 214 million (1 in 7) missed more than three-quarters of

in-person learning.¹⁵⁷ Predictably, there have been alarming rises in incidents of gender-based violence and violence against children.¹⁵⁸ The full social and economic impacts, however, remain unknown but 3.94 trillion U.S. dollars of lost economic output were projected for 2020.¹⁵⁹

In most countries, urban areas were the first to be affected by the virus. via infected international travellers. not due to density alone but rather as result of a combination of poverty, limited access to healthcare, and poor housing conditions, with deprived areas being most affected.¹⁶⁰ The vulnerable in society, often for whom urban areas are most inhospitable already, were disproportionately affected. Informal workers, the elderly, children, the disabled, the homeless and migrants have required significant support. For example, during the first month of the crisis, in Africa and Latin America, where the informal sector represents between 67 and 90 per cent

145. World Health Organization, "Closing the Gap in a Generation: The WHO Report on Social Determinants of Health" (Geneva, 2008).

146. Un-Habitat and WHO, "Hidden Cities: Unmasking and Overcoming Health Inequities in Urban Settings."

147. World Health Organization, "Global Report on Urban Health: Equitable, Healthier Cities for Sustainable Development."

148. WHO, "Universal Health Coverage," Fact Sheets, 2021, https://www.who.int/ news-room/fact-sheets/detail/universalhealth-coverage-luhc).

149. UCH2030, "State of Commitment to Universal Health Coverage : Synthesis , 2020 Urgent Action for Health Systems That Protect Everyone – Now Key Targets Commitments and Actions in the Political Declaration on UHC," 2020, https://www. uhc2030.org/fileadmin/uploads/uhc2030/ Documents/Key_Issues/State_of_UHC/ SoUHCC_synthesis_2020_final_web.pdf.

150. WHO, "Universal Health Coverage."

151. World Health Organization, "Global Report on Urban Health: Equitable, Healthier Cities for Sustainable Development"; Un-Habitat and WHO, "Hidden Cities: Unmasking and Overcoming Health Inequities in Urban Settings."

152. World Health Organization, "Closing the Gap in a Generation: The WHO Report on Social Determinants of Health."

153. Johns Hopkins University of Medicine, "Coronavirus Resource Center."

154. Institute for Health Metrics Evaluation (IHME), "Estimation of Total Mortality Due to COVID-19," n.d.

155. Institute for Health Metrics Evaluation (IHME).

156. Pathways for Prosperity Commission, "Charting Pathways for Inclusive Growth," *Pathways for Prosperity Commission* (Oxford, 2018), https://pathwayscommission.bsg. ox.ac.uk/sites/default/files/2018-10/ inclusive-growth-report-180928-final-web. pdf.

157. UNICEF, "COVID-19: Schools for More than 168 Million Children Globally Have Been Completely Closed for Almost a Full Year," Press Release, n.d.

158. Amber Peterman et al., "Pandemics and Violence Against Women and Children," *Working Paper 528*, 2020, https://doi. org/10.1007/s12103-020-09578-6; Shalini Mittal and Tushar Singh, "Gender-Based Violence During COVID-19 Pandemic: A Mini-Review," *Frontiers in Global Women's Health* 1, no. September (2020): 1-7, https:// doi.org/10.3389/fgwh.2020.00004.

159. statista, "Impact of the Coronavirus Pandemic on the Global Economy -Statistics & Facts," accessed May 21, 2021, https://www.statista.com/topics/6139/ covid-19-impact-on-the-globaleconomy/#dossierSummary.

160. Dorothée Allain-Dupré et al., "The Territorial Impact of COVID-19 : Managing the Crisis across Levels of Government," *OECD Tackling Coronavirus*, 2020, https:// www.oecd.org/coronavirus/policyresponses/theterritorial-impact-of-covid-19-managing-the-crisis-across-levelsofgovernment-d3e314e1/. of total employment, informal workers lost as much as 60 per cent of their earnings.¹⁶¹ Cities have played a central role in the implementation of the aforementioned public health measures and in response to their parlous socioeconomic effects. The power of bespoke responses to local situations has highlighted the importance of working at smaller as well as larger geographical scales, emphasizing the importance of urban scale knowledge, particularly tracking and tracing cases, and city specific interventions that reflect and respond to local differences.

The role of cities has been shaped by the nature of their powers and the spatial dimension of the COVID-19 pandemic. The continued provision of essential services has fluctuated. Transportation, for example, experienced decreases in ridership but continued to be necessary for moving and protecting "essential workers". At the same time, WASH and social services became more important than ever in protecting against transmission and the economic effects of lockdowns, respectively. Simultaneously, the income sources of cities decreased, particularly those that were not from diversified sources.¹⁶² For example, municipal revenues in Austria, Canada, Finland, France, Germany, Iceland, Italy, Japan, Switzerland, and the United Kingdom experienced significant decreases¹⁶³ and it is expected that cities in low and middle-income countries follows a similar trend. Globally in 2021, estimated average loses in revenues of local governments, have been between 15 and 25 per cent 164

COVID-19 has been a "stress test" 'for cities' participation in urban governance for health, giving an idea of how well they perform and helpful in identifying effective governance practices.

A literature review¹⁶⁵ of 194 published scientific articles aimed to understand the impacts of the pandemic on cities and to identify major lessons for resiliency to pandemics. Similarly, an OECD study¹⁶⁶ on the territorial impact of COVID-19 provides insights to manage future pandemics. The findings were compared to the governance recommendations from WHO in the reports mentioned¹⁶⁷ previously several guiding principles can be distilled.

Cities and national governments have a complementary role to

play. Centralized decisions such as: border closures; economic recovery packages to, for example, strengthen health systems; the provision of disaggregated national-level intelligence; the clarification of roles and responsibilities; the support of inter-municipal and inter-regional cooperation, and others are essential. For example, shared procurement of essential items such as personal protective equipment and regional travel corridors can be supported by regional or national governments.

Cities must act quickly, effectively and in unison with other levels of government.¹⁶⁸ The boundary of the intervention of national and regional governments can be found when local-level ingenuity and flexibility to innovate are no longer being supported. To achieve acting in unison, WHO and UN reports¹⁶⁹¹⁷⁰ call for a partnership and a Health in All Policies Approach (HiAP). Partnerships across levels of government (local, national, regional) are highlighted as essential for achieving health. HiAP decision approach recognizes that most public policies have the potential to influence health and health equity and calls on all sectors to account for health outcomes. benefits and costs. The adoption of these governance approaches has proven to be essential during the pandemic and are muscles to be exercised and strengthened for times of stress, such as pandemics.

Effective and truly representative local government associations (LGAs) nationally, regionally and globally play a critical role. These associations exist in many countries and are usually affiliated with United Cities and Local Governments and serve the important function of strengthening cities' technical capacity, advocacy, and facilitating city-to-city partnerships. 161. UN, "Policy Brief: COVID-19 in an Urban World," *United Nations*, no. July [2020]: 1–30, https://www.un.org/sites/un2.un.org/ files/sg_policy_brief_covid_urban_world_ july_2020.pdf.

162. UN.

163. Allain-Dupré et al., "The Territorial Impact of COVID-19 : Managing the Crisis across Levels of Government."

164. UN, "Policy Brief: COVID-19 in an Urban World."

165. Ayyoob Sharifi and Amir Reza Khavarian-Garmsir, "The COVID-19 Pandemic: Impacts on Cities and Major Lessons for Urban Planning, Design, and Management," *Science of the Total Environment* 749 (2020): 1–3, https://doi. org/10.1016/j.scitotenv.2020.142391.

166. Allain-Dupré et al., "The Territorial Impact of COVID-19 : Managing the Crisis across Levels of Government."

167. Un-Habitat and WHO, "Hidden Cities: Unmasking and Overcoming Health Inequities in Urban Settings"; World Health Organization, "Global Report on Urban Health: Equitable, Healthier Cities for Sustainable Development."

168. Allain-Dupré et al., "The Territorial Impact of COVID-19 : Managing the Crisis across Levels of Government."

169. Un-Habitat and WHO, "Hidden Cities: Unmasking and Overcoming Health Inequities in Urban Settings"; World Health Organization, "Global Report on Urban Health: Equitable, Healthier Cities for Sustainable Development."

170. UN, "Policy Brief: COVID-19 in an Urban World."

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Cities need the financial resources to provide services, facilitate dialogue locally and involve citizens

meaningfully. The gap between decreasing revenues and increasing expenditures, should be closed. During COVID-19 cities have sustained the economy through support to small and medium enterprises and providing for vulnerable populations by: providing food, medicine and care to people who need it most; creating new ways of travel to reduce transmission by for example, providing bike infrastructure and safer public transit environments; restaurant and tourism attraction closures; supporting or leading track, isolate test, and treat efforts, and the list is endless. However, the aforementioned "gap" should be closed through incentivizing processes and technologies that generate lesser downstream costs, such as green technologies including clean energy. In many LMICs, there is simply no sufficient resources to re-distribute and, in an interconnected world as has become evident during the pandemic, this problem affects everyone.

Citizen participation in health has been found to lead to empowerment,¹⁷¹ over the long term and in better results for health programming in the

short term.¹⁷² It requires a significant investment in resources from cities' often with gains that are difficult to measure.¹⁷³ Social participation remains intrinsic to being human and improves service provision outcomes and buy-in. Nevertheless, a study¹⁷⁴ of participation processes to engage grassroots stakeholders in decisions related to municipal infrastructure. land use and services, found that the participation processes are often cut following the planning phase despite known benefits of meaningful participation.¹⁷⁵ Service delivery often takes place without accountability to local stakeholders and the gains from participation are due to independent grassroots action rather than enabled or supported by local government.

Cities should maintain the channels of communication, which require the empowerment of citizens and civil society and are processes that are ongoing but remain a fundamental pillar of urban governance and a key role for cities. Lest we rely on biomedical approaches to cure ills and ignore this fundamental pillar of public health is at our peril, particularly in the face of the challenges humanity faces from rising inequality, climate-related disasters, and pandemics.¹⁷⁶ Cities have showed quick, proactive, local-level reactivity during the pandemic. For example, in providing for the vulnerable through food, support to micro-enterprises, healthcare and through controlling clusters and others. This modus operandi should be maintained after COVID-19 for a healthy city. Those countries that have had most success in Asia or Africa built on prior histories of response to SARS, Ebola, H1N1and maintained that learning, institutional capacity and communication.

Cities should actively engage in knowledge exchange and healthfocused intersectoral coordination, termed "joined-up government". Thi

termed "joined-up government". This can be achieved by applying principles from HiAP at the local level and acting beyond.¹⁷⁷ The Healthy Neighbourhoods Programme, in Quito¹⁷⁸ and the Healthy Streets Programme in London,¹⁷⁹ are example, which arguably prepared those cities for integrated action during the pandemic.¹⁸⁰ The Quito project joined-up action for health equity, empowering neighbourhoodlevel task force teams, to work with integrated departments (health, education, urban planning, waste collection, and others) of the city to achieve better environments for health. The London programme "joinedup" through the project cycles, from design to implementation, and across departments including transport, public health, spatial planning, environment and economic development. The working relationships between these departments is described as "soft" infrastructure, in the health policy literature, and essential for the type of action necessary to affect health, including during a pandemic. This soft infrastructure should therefore be maintained, developed, and nurtured, outside of pandemic times not exclusively for pandemic preparedness but because the complexity of addressing urban health merits it.

171. Zoë Heritage and Mark Dooris, "Community Participation and Empowerment in Healthy Cities.," *Health Promotion International* 24 Suppl 1 (2009), https://doi.org/10.1093/heapro/dap054.

172. Amy S. Katz, Rebecca M. Cheff, and Patricia O'Campo, "Bringing Stakeholders Together for Urban Health Equity: Hallmarks of a Compromised Process," *International Journal for Equity in Health* 14, no. 1 (2015): 1-9, https://doi.org/10.1186/s12939-015-0252-1; World Health Organization, "Global Report on Urban Health: Equitable, Healthier Cities for Sustainable Development."

173. Rene Loewenson and Andreas Papamichail, "Learning from International Experience on Approaches to Social Power and Participation in Health International Meeting Report" (Aberdeen, 2017), https:// www.healthinnovation.org/resources/ shapinghealthblog/Shaping-health-meetingreport-2017.pdf.

174. Katz, Cheff, and O'Campo, "Bringing Stakeholders Together for Urban Health Equity: Hallmarks of a Compromised Process."

175. Heritage and Dooris, "Community Participation and Empowerment in Healthy Cities."

176. Rene Loewenson et al., "Reclaiming Comprehensive Public Health," *BMJ Global Health* 5, no. 9 (2020): 3–7, https://doi. org/10.1136/bmjgh-2020-003886; Rene Loewenson et al., "Beyond Command and Control: A Rapid Review of Meaningful Community-Engaged Responses to COVID-19," *Global Public Health* 0, no. 0 (2021): 1–15, https://doi.org/10.1080/1744169 2.2021.1900316.

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4. Conclusion

The Roman poet Virgil said over two thousand years ago, "(t)he greatest wealth is health." In reality, it seems that wealth buys health. Vulnerable or marginalized populations are excluded from health, while the choices of those who care only for themselves place others at risk. In a world that is in desperate need of solutions to threats such as the rapidly changing climate and pandemics, cities are positioned to be a principal actor in the task to create the conditions for a healthy urban future.



PEAK Urban Programme team at the 2019 retreat in Bangalore, India Credit: PEAK Urban Research Programme



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Appendix 1: PEAK Urban framing for city-based practitioners

(P)rediction New forms of data and new ways of analysing it and empower "new urban sciences" to deploy tools of data analytics to see the city differently They surface patterns and trends that can help understanding a city present and future. Cities are increasingly complex systems of systems. Predictive models can rarely be exactly right, but they can be useful in generating future scenarios that are plausible.	(E) mergence The interactions of urban systems made up of built form and infrastructure as well as cultural practices and daily life produce unforeseen or unpredictable results. Cities are always evolving and building on what already exists, but they are never finished.
 What are the problem(s) and opportunities(s) my city faces? Knowing what patterns or trends would help me to understand the problem/opportunities better? How has and will they continue to evolve? Beyond mapping the dynamics of urban life, data and analytics can provide information on informal activities (e.g. housing, travel, business). What data is relevant and available? Available data include imagery via satellite and street photography, personal and environmental statistics captured by both mobile apps and fixed sensors, and social networks via online platforms. National and international-level public and private institutions may have repositories of relevant data. What data analytics tools are available and what can they do? Data analytics tools include machine learning and artificial intelligence may identify patters and relationships within data and build predictive models. What technical expertise does my city require to leverage the power of prediction? Partnerships with universities, think-tanks, regional development banks, start-ups, can help mitigate for talent shortages in areas of specific expertise that is required temporarily. 	 1. How do I make sense today of what may evolve tomorrow in the city? Approaching understanding urban issues requires five important principles: humility, attentiveness to detail, a recognition that tabula rasa (starting from scratch) is a fiction in any urban context and that design always invokes symbolic meaning and an ethical as well as a functional consideration. 2. What are the values (i.e., intrinsic - value in its own right; instrumental - for utility to achieve an end, fairness, do no harm, etc.) that inform choosing any one avenue to city-building over another? How do we justify any given decision to deliver a service, build infrastructure or implement a project? The values may change overtime as public preferences shift. This has implications for decisions that have been made in the past, present and with an influence in the future. Considering carefully the framework or sets of values for making decisions, who they are shared with and how they are informed becomes as important as the final products of those decisions.
(A)doption Technologies are taken up, valued and captured differently by cities. Residents may use and be affected by technologies in ways that are different than in other cities and even neighbourhoods.	(K)knowledge Wicked problems require 'clumsy' or bespoke solutions that are formed by the sum of the knowledges influencing the city-building process.
 How are new technologies or re-invented old technologies being used, governed and optimised locally? Local contexts shape how technologies are used, the same e-bicycle is used differently in New York, Nairobi, Oxford and Quito. How does a technology in one system (eg. transport) impact on others (e.g. economic clusters, public health provision)? What is different (culturally, ideologically, & otherwise) about the places where a technology has worked in the past? Unique local logics shape the way technologies are used. Who are the technologies benefiting and who are they not reaching or harming? What aspects of the technologies need to be leveraged and mitigated for? Adopting new technologies can have uneven or unintended consequences. Does the adoption of a technology have value or merit? 	 1.How do different experts such as economists, planners, engineers 'know' the solution to city problems? How do I balance between these multiplethese multiple forms of scientific expertise? The type of information that is valued (economic growth liveability, longer-term ecosystem protection) will guide the data collected and inform the decisions made. 2.What voices truly influence the shape a city takes? Arbitration between public goods and private interests mediated by professionals in city authorities but not exclusively as the community, civil society, even organized crime and many others also play a role. How do we identify and make visible the trade-offs between alternative future scenarios (and knowledges of the city) as much as the solutions to particular 'wicked problems'? It is unlikely a future scenario or solution will benefit everybody equally. In fact, since they are likely to make some worse off, making 'visible' those scenarios is a paramount place to start.
The value attributed varies from different vantage points (i.e. architects vs. planners vs. engineers vs. community development professionals).	Source: Prepared for UDP and UCLG's members using content from: The future of the future city? The new urban sciences and a

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