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DELIVERING URBAN HEALTH THROUGH URBAN PLANNING AND DESIGN

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Introduction

The world is increasingly becoming urban. Estimates show that 54.6% of the world’s population lived in cities in 2016, with a forecast of 60% by 2030 (UN Department of Economic and Social Affairs 2016). The 600 largest cities produce 70% of the world’s economic activity (McKinsey Global Institute 2011). Altogether cities produce 80% of the world GDP (UN Habitat 2016) and are responsible for 75% of natural resources consumption and global carbon emission (Hancock 2018). The relatively recent rise of city living and associated human activity has led to huge impacts on the health and wellbeing of both people and planet. This chapter explores how urban planning and design policies are emerging as key policy sectors to respond to urban health threats, promote healthy behaviours and reduce health inequalities. First, the chapter defines the role of cities in the earth’s ecology, how environment and health challenges are interlinked, and how the delivery of healthy sustainable urban communities requires complex interventions. Second, the chapter delves into the urban form and how it contributes to these urban environment and health challenges. Planning and design principles have emerged out of research in the field, increasing the scope for spatial and transport planning to shape the urban environment, reducing populations’ exposure to environmental threats and encouraging healthy or unhealthy habits. Yet neither the emergence of a strong evidence base for the role of the built environment on health nor the development of ‘healthy’ urban planning principles, guidance or indicators will lead on its own to the rethinking of the way cities are planned and designed. Such changes require political will and the right governance to be in place. Hence, finally, the chapter highlights how an international urban agenda is now developing that is potentially able to galvanize positive change towards a sustainable and healthy urban future based on the strength of city governance and its planning and design policies.

To carry out the governance and policy analysis, the chapter draws from evidence reviews and academic and grey literature in social sciences, planning, public health and environmental science including policy documents. It also draws from seminar discussions with key stakeholders in the UK for an ESRC project (Carmichael et al. 2019, Carmichael et al. 2016) and two consultation events with WHO officials and international stakeholders (Carmichael et al. 2017). While the chapter is international, most of the evidence base comes from high income countries, in particular European countries. The chapter only covers formal cities; although informal or refugee settlements might face similar threats, they will also face more complex sets of political, economic and social challenges.
Urban Environment and Health Stressors

Urban Health: Global Drivers and Trends

Globally, life expectancy has increased and child mortality has reduced over the centuries. However, in the 20th century a number of new factors emerged leading to new environment and health crises. The world’s population has quadrupled in the past century, leading to changes in the use of over half of the world’s land mass. Human activities have altered ecosystems and destroyed wildlife habitats because human needs outweigh planetary resources (Agudelo-Vera et al. 2011; Steffen et al. 2015). With over 54% of the world population (and 80% of Europe’s population) now urban, and a majority of the world economy produced in cities, urban centres contribute disproportionally to these threats. Cities have been described as ‘economic and consumer hubs, entropy accelerators through high energy human activities creating disorder, waste and pollution for the planet as a whole’ (Girardet 2015).

The risks for human health are also reaching crisis point. With concentration of human activities and movement in cities, urban air pollution has become a key issue. It is the world’s single largest environmental health risk, with 7 million deaths attributable to the joint effects of household and ambient air pollution in 2012 (WHO 2014). Particulate matter, carbon monoxide or nitrogen dioxide emissions and other pollutants also cause a range of serious health problems (stroke, lung and heart disease, cancer, asthma). Increased life expectancy means people are statistically more exposed to chronic conditions (lung and heart disease, cancer, diabetes, mental illness, asthma) and can become more vulnerable to the effects of air pollution and other environmental stressors or extreme weather events such as heatwaves and cold spells.

Other demographic stressors challenge the health of urban dwellers. As people have become more mobile, within and between countries, including mobility motivated by economic hardship, wars or civil unrest, cities must provide services to their established residents but also have to cater for the needs of new incoming groups of populations that contribute to economic growth and need to be socially integrated. Policy choices can lead to tensions between native and incoming populations. Furthermore, ageing of the population and intergenerational tensions put pressure on existing infrastructures and resources in some areas.

Much more importantly, health inequalities between socio-economic groups still exist today. For instance, ‘almost half of the excess mortality in lower socioeconomic groups is explained by inequities in cardiovascular diseases’ (Dahlgren and Whitehead 2007). In rich countries, a link has been made between income inequality and health (Wilkinson and Pickett 2009): in London 40% of the poorest groups suffer from long-term limiting illness, while only 5% of the richer groups do. Socio-economic status alone does not explain the difference in health amongst the population, and evidence shows that the poorer in society are more exposed to the risks associated with urban living with social, economic and environmental cost for society. In particular, housing (e.g. housing design and overcrowding), transport (e.g. active travel, public transport and car traffic), social environments, and accessibility of healthy food options and green space can lead to health inequalities (Allen and Allen 2015).

Scientific understanding of a strong link between urban environment and planetary boundaries provides the evidence base for making tackling climate change and promoting health and equity a necessary priority for all levels of governance. It also highlights the role played by the built environment as an environment and health stressor.

Conceptualizing the Urban System and Urban Health Stressors

Resource allocation, distribution and deployment through time make cities complex systems (Government Office for Science 2014). Modelling how natural systems and human activities interact can offer invaluable support to policy-making. System thinking has emerged to explain more
comprehensively these interactions and inform the development of multi-criteria decision analysis and tools to prioritize strategies for environment and health (Woods et al. 2016). International financial institutions such as the European Investment Bank have incorporated system thinking into their analyses of urban sustainability, particularly in the field of reduction of carbon emission and urban mobility. Public health has led the field, moving away from biomedical models of health and developing socio-ecological systems and ecosystem approaches.

Dahlgren and Whitehead’s (1991) socio-ecological model of health (Figure 5.1) identified social and economic factors but also living and working conditions as determinants of health and, more importantly, inequity. Housing, water and sanitation, (physical) work environment, access/proximity to health care and other services, and food systems all impact unevenly on different population groups. Of course, the issue of apportioning health risks to different determinants remains a critical methodological problem for academics.

This model raised awareness around the broader determinants of health, and identified specific sectors of intervention to reduce social inequity in health. Since the model was developed, public health thinking has moved on to explain more clearly the interdependencies between human activities, quality of the human habitat and pressures on natural resources in order to address current human and health challenges. The Ecosystem-enriched Driving Force–Pressure–State–Exposure–Effect–Action (eDPSEA) model (Figure 5.2) (Reis et al. 2015) now links ecosystem condition (biophysical, chemical or biodiversity) to wellbeing. Changes in ecosystem condition will lead to changes in wellbeing (i.e. health, income and poverty) through impacts on a range of services and policies.

With urbanization, human activity and traffic density within cities put pressures on land, potentially reducing access to green spaces, and increase exposure to air pollution, noise and heat.

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**Figure 5.1** Dahlgren and Whitehead’s (1991) socio-ecological model of health.
*Source: Dahlgren and Whitehead (1991).*
Depending on where people live and their lifestyles, the urban environment becomes a contributing factor to respiratory and cardiovascular disease, cancer and even premature mortality (Nieuwenhuijsen 2016). The eDPSEEA model emphasizes the interconnections between various variables found in cities at different scales (building, street, neighbourhood, city). It suggests that sector-based analysis cannot in itself address the negative and complex interactions of environmental and human factors on health. For instance, housing and energy efficiency, street and green infrastructure and related ecosystem services, city and transport system (Nieuwenhuijsen 2016) all have impacts on each other. A simple example is home insulation and energy efficiency methods leading to a worsening of indoor air quality: good intentions towards a protection of the environment could potentially lead to negative impact on human health (Vardoulakis et al. 2016).

The Importance of the Built Environment as a Determinant of Health Equity

The eDPSEEA clarifies the complexities of the urban metabolism at a meta-level, taking into account the broad contexts and urbanization drivers and emphasizing the importance of ecological systems on
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human health, in particular environmental health. However, urbanization, immigration, global economic trends or market regulations remain outside the control of local policy-makers. Furthermore, physical and mental health, and health equity are not necessarily influenced by the state of our natural environment but can also be associated to social structures and accessibility of services and amenities in our cities. The human experience of cities depends on how health is supported by the location of residence, workplace and leisure facilities, i.e. where we live, work and play. The settlement health map, a built environment approach to urban health inspired by the Dahlgren and Whitehead (1991) model, complements the eDPSEEA, as it exposes these aspects in more depth (Figure 5.3) (Barton and Grant 2006). Mounting evidence shows that the urban habitat at every scale, from building to city to region, can offer pathways to health equity and wellbeing (Barton et al. 2015; Carmichael et al. 2017; Public Health England 2017). Shaping local neighbourhoods and communities fits particularly well with traditional urban and transport planning functions and public policies promoting health equity.

Figure 5.3 The settlement health map.
Findings might depend on socio-economic and political contexts (countries studied in parenthesis below), but international evidence shows numerous inequalities by where people live. It highlights the association between poorer quality neighbourhoods and low quality housing and higher exposure to health risks or impact on residents’ behaviours. In Europe, evidence shows that areas with high socio-economic deprivation (measured through percentage of unemployment and manual workers) have a higher excess of mortality (EU: European Commission—Directorate-General for Health and Consumers 2013). The rates of chronic disease and obesity are higher in poorer neighbourhoods (global: Chaix 2009). Evidence is emerging strongly on the associations between lack of access to green space and health inequalities. For instance, the socio-economic status of women might influence the beneficial effects of green spaces because their (poorer) neighbourhoods have fewer parks and walking trails, and usage of green space depends on the level of education or women’s income (France: Kihal-Talantikite et al. 2013). Green space accessibility and proximity are pathways for people to benefit both physically and mentally from engaging with nature in an urban environment (Allen and Allen 2015). Yet research in England found that 20% of the most affluent neighbourhoods had five times the amount of green space that the most deprived 10% of neighbourhoods had (England: CABE [2010], quoted in Allen and Allen 2015, p. 103).

A striking finding is the combination of health hazards in poorer neighbourhoods. Research showed that the more deprived the neighbourhood in England, the higher the incidence of human exposure to various environmental health risks including air, soil or water pollution, flooding, road accidents and lack of access to green infrastructure (England: Public Health England 2010). Rows of sub-prime lenders, fast-food restaurants, off-licence shops (selling alcohol) and betting shops concentrated in poorer neighbourhoods limit access to healthier produce and habits (England: Townshend 2016). Children from lower income areas will be more likely to be injured in accidents and to be exposed to traffic hazards in their less safe neighbourhoods (Australia: Giles-Corti et al. 2011). Around 100,000 deaths are linked annually to inadequate housing (Europe: Braubach et al. 2011), with factors of inequity including location, type and design of dwellings, and affordability.

Drawing lessons for policy remains a complex issue, as multiple factors contribute to health inequalities at the neighbourhood level: a palette of local and national policies are required to address multiple deprivation.

**Shaping Healthy Cities: Responses via Urban and Transport Planning**

The exploration of the built environment as a determinant of health in neighbourhoods and cities has furthered the identification of healthy planning principles and design features. However, shaping healthy cities should not be seen as a new function of urban planning, but rather a reassertion of the original public health purpose and function of 19th century modern planning. With the industrial revolution, urbanization exploded in Europe, but urban living conditions for the working class were appalling: overcrowding, poor housing and sanitary conditions, and lack of open spaces. Britain led the planning revolution, with legislators recognizing the link between urban environment and health and requiring local authorities to address sanitation and develop a sewage system by the 1870s (Barton 2017). Planning was effectively an instrument of public health. With the professionalization and institutionalization of planning during the 20th century, the public health dimension of planning got lost both in the UK and in the USA. For Corburn, the rise of the emphasis on the free market also led to a disappearance of the health and wellbeing focus of planning (Corburn 2009).

In the post-World War II era, some cities in Europe have emerged with stronger health or environment friendly planning practices (Copenhagen, Kuopio and Freiburg). Today, the wealth of the evidence on the links between the urban environment (from individual buildings to the city) and a range of health risks, ranging from air pollution to obesogenic environments, requires a global
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reappraisal of the purpose of planning. Planners and other stakeholders of the development process can draw on good urban design and practice lessons from evidence showing that housing, neighbourhood design, transport, food environments and the natural environment all have an impact on population health and wellbeing (Bird et al. 2018; Public Health England 2017). The impact on health and wellbeing can be direct (e.g. reduction in environmental risks such as particulate matter or noise level) or indirect through behaviour change (e.g. physical activity through active travel).

At the building level, one of the key issues in the era of climate change is thermal comfort. For instance, the risks of overheating in buildings can have an impact on wellbeing, stress and ultimately mortality levels (Lomas and Porritt 2017). More broadly, a recent systematic review of evidence has shown that ‘housing refurbishment and modifications, provision of adequate heating, improvements to ventilation and water supply were associated with improved respiratory outcomes, quality of life and mental health’ (Ige et al. 2018). At the neighbourhood level, two key examples developed below to illustrate this relationship are connectivity of urban areas and the design and maintenance of green spaces. As a result of new findings on the impact of the living environment on health, healthy planning guidance, criteria and health indicators have been developed over the years by a number of organizations. Above all, as current models conceptualizing the urban metabolism suggest, scientists (e.g. public health, environment management) must inform built environment research and practice, in particular architecture and urban and transport planning, to promote sustainable human activities, encourage behaviour changes and support equity (Reis et al. 2015).

High Connectivity: Key Contributor to Planetary and Human Health

Transport and urban planning systems often encourage car use over active travel, resulting in negative impacts on health and environment. The European example illustrates this problem. Sprawl in Europe ‘has accelerated in response to improved transportation links and enhanced personal mobility’ (EEA 2006). In the period 1980–2000 low density suburban development in the periphery of Europe’s cities became the norm, with the expansion of urban areas in many eastern and western European countries increasing by over three times (EEA 2006). Car use in sprawling cities was clearly a major factor in the growth of urban greenhouse gas emissions. The impact on health also shows the importance of rethinking the way we design urban settlements. Nearly 85,000 people died from road traffic injuries in the WHO European region (53 countries) in 2013 (WHO 2015). Nearly 40% of road fatalities in the WHO European region are ‘pedestrians, cyclists and motorcyclists’ (WHO 2015). The level of road danger varies greatly between countries, and ‘mortality due to road traffic’ is nearly nine times greater in the worst affected EU country than the least (WHO 2015). Transport is also a major source of outdoor air pollution, annually causing 3.5 million deaths (UNEP 2014). Yet travel statistics have suggested that a large number of Europeans’ journeys currently taken by car could be taken by active travel modes, as over 50% of European car journeys are shorter than 5 kilometres (Dekoster and Schollaert 1999).

The promotion of high connectivity, safer, mixed neighbourhoods, public transportation, pedestrian facilities and proximity of services could contribute to a reduction in car journeys and traffic emissions as well as contribute to an influence on the take-up of physical activity (Booth et al. 2005; Adlakha et al. 2017; Lee et al. 2017). Indeed, physical activity is considered to be an important lifestyle factor for long-term health, preventing obesity and chronic diseases (Saelens et al. 2003; Booth et al. 2005; Warburton et al. 2006). Evidence shows that physical ill-health can in many instances be averted by physical activity, which has enormous social, personal and economic impacts. For example, total costs of cardiovascular disease across six European nations (France, Germany, Italy, Spain, Sweden and the UK) were estimated to be €102.1 billion in 2014 (CEBR 2014). In children, a reduction in physical activity has been associated to rising levels of childhood overweight and
obesity, and activities such as cycling to school are considered as potentially contributing to a better cardiovascular risk factor in children (Denmark: Andersen et al. 2011). People who regularly use active transport (walking and cycling) gain health benefits (global, with US focus: Pucher et al. 2010; global: de Nazelle et al. 2011).

Transport, urban design and planning literature has linked characteristics of neighbourhood design to the take-up of physical activity. As a study of 14 cities in all continents has shown, differences in levels of physical activity between the most activity-conducive neighbourhoods and the least can be between 68 and 89 minutes a week, representing 45–59% of the recommended weekly activity duration (global: Sallis et al. 2016). ‘Net residential density’, ‘intersection density’, ‘public transport density’ and ‘number of parks’ were (statistically) significantly associated to physical activity levels.

Local plans and land use strategies and the implementation of principles such as connectivity, higher density and mixed developments are some of the local policy tools that planners, architects and other stakeholders in development processes can exploit to reduce car traffic and promote active transport modes. The layout of the built environment can influence walking and cycling, given the multi-purpose characteristics in urban areas of these two modes of active travel (exercise, leisure or mode of transportation) (Saelens et al. 2003). Savings can also be made by promoting higher connectivity and density.

Generally, the efficiency savings of more compact city development as compared with market driven suburbanization can be as high as 20–45% in land resources, 15–25% in the construction of local roads and 7–15% savings in the provision of water and sewage facilities. (EEA 2006)

Figure 5.4 Copenhagen.
© Mark Drane—Connectivity facilitated by mixed development and active travel creates convivial urban spaces.
Modelling of air pollutant dispersion can inform planners’ decisions on high density design, addressing air pollution exacerbated through street canyons, for instance (Yuan et al. 2014).

However, questions remain of whether connectivity can reduce health inequalities. Research in Melbourne neighbourhoods shows that walking in disadvantaged areas with greater street connectivity and land use mix might help to reduce inequalities in chronic disease by offsetting unhealthy behaviours like smoking and poor diet (Turrell et al. 2013). More research is needed to explore whether the results would be replicated in other contexts.

**Urban Green Spaces: A Key to Urban Mental and Physical Happiness and Wellbeing**

Overall individuals seem happier when living in urban areas with a greater amount of green space. Urban green spaces, when easily accessible and well kept, are linked to numerous physical, mental health and equity benefits (Guite et al. 2006; Maas et al. 2006; Nielsen and Hansen 2007; Kihaltalantikite et al. 2013; White et al. 2013; Braubach et al. 2017). While further research is needed to explore the associations between green infrastructure, types of physical activities (e.g. walking, gardening, active travel or recreational activities) and impact on mental wellbeing (White et al. 2013) or physical health (Mytton et al. 2012), the current evidence base shows how urban green spaces can encourage more physically active behaviours. Children who experience more than 20 minutes of daily exposure to increased levels of green space engaged in approximately five times the daily rate of moderate to vigorous physical activity compared to those children with lower levels of daily exposure to green spaces (Almanza et al. 2012; Bowen and Parry 2015). Potential positive association with green space and some types of physical activities such as gardening and occupational activities has also been found (Mytton et al. 2012).

*Figure 5.5 Copenhagen green space.*

© Mark Drane—green roof in Copenhagen: benefiting urban environment and health in cities.
If 20% of the population who live within 2 kilometres of a green space used it for 30 minutes of physical activity per day on five days per week, the saving to the National Health Service could be over £1.8 million per year.

(European Commission—Directorate-General for Environment 2012)

Green infrastructure in cities can take many shapes and comes in different sizes, from small front gardens to large city parks, all with a number of functions to achieve health benefits.

Green spaces also contribute to urban adaptation and mitigation to climate change with health benefits. For instance, it is estimated that heat-related mortality in Europe in the 2080s will increase by between 60,000 and 165,000 without adaptation and physiological acclimatization, compared to the present baseline (EEA 2016). Daytime temperatures in a large urban park can be 2 to 3 degrees C lower than in surrounding streets, with cooling effects felt up to 100 metres from the site (EFTEC 2013). Green infrastructure such as parks, gardens or green roofs also serves as sustainable urban drainage (SUDS), contributing to flood adaptation and mitigation in cities by reducing stormwater runoff or filtering urban water potentially saturated with oil from cars and lorries.

The strength of the current evidence can inform place-shaping policies, local plans and urban development projects. Local planners and other stakeholders in the development process hold the power to design quality green spaces and to ensure their availability and accessibility. Other services...
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need to ensure maintenance of green infrastructure to ensure their sustainability. An interesting case study is the emerging neighbourhood of Barking Riverside, London, set alongside 2 kilometres of Thames river frontage and one of the largest developments in the UK, with 10,800 new homes planned between 2017 and 2032. There, local planners collaborate with the local community, health sector, developers and academics to develop green spaces and waterways, evaluate how they contribute to health and health equity and embed these health findings into planning policy.

Balance of power between public and private development actors is crucial too to avoid the reduction of urban green infrastructure assets or their appropriation for the benefit of private interests.

Guidance Tools for Urban Planning and Design Practice

Planning guidance and indicators have emerged out of the public health evidence base to help planners consider the impact of their plans, strategies and urban development projects on human and planetary health. They focus primarily on integrating sustainable design (e.g. buildings, streets, green infrastructure and neighbourhood structure) into urban projects or consider the impact of plans on a broad range of health outcomes at different scales, from the building to the city. They include, for instance, WHO’s healthy urban principles (Barton and Tsourou 2000), WHO’s checklist of essential features of age-friendly cities (WHO 2007), the BREEAM Communities technical standard and International Healthy City Index (Pineo et al. 2018), TCPA’s healthy-weight environments planning (TCPA 2014) or Public Health England’s evidence resource for planning and designing healthier places (Public Health England 2017). With the synergy between natural and built environments, research is also exploring benchmarks for urban green infrastructure (Sinnett et al. 2018).

Planning guidance and indicators help to operationalize the buy-in by planners, developers and other stakeholders. A 2016 ESRC seminar with UK urban development stakeholders (Carmichael et al. 2019) identified that planning principles and indicators are useful for embedding a health dimension into planning practice. Guidance can be set to suit the needs of local contexts (for example, targets to reduce the number of fast-food restaurants in a local area). Indicators can be used at different stages of planning practice (they can for example be used to set targets, right through to monitoring practice).

Yet a robust evidence base as well as guidance and indicators will not, by itself, necessarily drive change in planning practice. Successful policy-making also requires political commitment (Hallsworth 2011). Indicators need to be embedded in local or national planning policy, signalling a strong commitment from policy-makers to an urban health and environment agenda; if not, they risk being overturned by local politics, as has been the case in relation to policies to limit the density of hot food takeaways in some areas in England. Changes depend on the ability of the public sector, local authority planners and city leaders to set the benchmark for healthy planning and design.

Importance of City Governance in Promoting Healthy Planning and Design

Urban health modelling, whether at the meta-level (eDPSEEA) or with a focus on built environment policies (settlement health map), suggests two key principles for built environment policy-making that will deliver healthy cities:

1. Develop policies, plans or projects that address climate change but also promote health and reduce health inequalities.
2. Integrate sectors—urban and transport planning and other relevant built environment strategies (e.g. renewal energy, housing, green infrastructure).
These priorities require a strong involvement of the local/city level upstream in policy formulation and policy-making (which can identify local challenges and engage with local communities) and downstream (to implement and evaluate policy itself, and ensure the buy-in of key stakeholders). It is outside the scope of the chapter to explore these in detail, but this section highlights both the emerging international political commitment to an urban agenda, which supports the mainstreaming of these priorities at city level, and the quality of city governance, which makes it a key player in urban planning and design.

**The Global New Urban Agenda: Promoting Local Infrastructure and Planning for Healthy Cities**

Despite advances in technologies and medicine, rapid urbanization and pressures on the world resources have brought the new trends and challenges discussed in previous sections, and have revealed the inability of isolated governments to eradicate poverty and inequality. This context has provided a strong driver for the development of an international policy framework that makes a clear connection between human activities and planetary boundaries and encourages an urban agenda for healthy cities to emerge across the globe. In 2015, the UN identified 17 Sustainable Development Goals (SDGs) and 169 targets aimed at reconfiguring how governments and the international community need to plan and implement actions to eradicate poverty and inequality, create inclusive economic growth, preserve the planet and improve population health.

Many of the 169 SDG targets have an urban dimension and, while addressing climate change, hold potential for significant public health improvements through built environment policies. The UN’s SDGs offer the opportunity to facilitate how urban environments and health systems are redesigned to ensure equity, health and sustainable development. Goal 11 is dedicated to making cities inclusive, safe, sustainable and resilient, with target policies such as housing, air quality and transport. Many other SDGs have a link to the design of the urban environment at building, street or neighbourhood level (Carmichael et al. 2017).

UN agencies are developing their own urban agenda for health and environment. UN Habitat now emphasizes the relationship between urbanization and sustainable development. Habitat III’s New Urban Agenda for the 21st Century (NUA) agreed in Quito by national and international policy-makers recognizes that cities have dramatically changed with urbanization trends, development of city-regions, urban corridors or mega-regions. The NUA explicitly considers and addresses the health risks and benefits of urban policies (UN Habitat III 2016). UNECE acknowledges the importance of the urban level to promote the Healthy Planet, Healthy People agenda through its land use, housing and energy efficiency policies as well as compact, inclusive, resilient, smart and sustainable cities (UNECE 2013, 2015). Together with WHO Europe, UNECE promotes the development of healthy and sustainable transport policies, with a focus on the promotion of active mobility and urban transport in the Transport, Health and Environment Pan-European Programme (THE PEP).

WHO (2016) emphasizes the urban dimension of the SDGs. A healthy urban environment requires horizontal multi-sector collaboration (health, housing, transport, urban planning, energy, education and finance at the city level) as well as vertical policy coordination and mobilization of partnerships between government, civil society and academia. The WHO European Healthy Cities movement and programme has for many years raised the profile of urban planning and design policies, leading to the identification of the 12 healthy planning principles mentioned earlier (Barton and Tsourou 2000). WHO, informed by research (Carmichael et al. 2017), also now argues for cities to play a greater role in pan-European decision-making to raise the importance of urban planning. In particular, WHO argues for cities and sub-national levels of governance to be engaged in the European Environment and Health Process (EHP), which brings together the 53 ministries of health
and of environment of the WHO Europe region regularly and focuses on topics such as air quality, climate change, housing, transport, urban health, and water and sanitation.

Finally, for the EU, cities are places of advanced social progress, democracy, cultural dialogue, diversity and environmental regeneration and are engines of economic growth (European Commission—Directorate-General for Regional Policy 2011; Government Office for Science 2014). The 2016 EU Urban Agenda aims to strengthen the urban dimension of European policies, and the polycentric nature of sub-national governance in Europe, focusing on sectors relevant to environment, health and equity, and areas of interventions with a key urban planning and design dimension (i.e. air quality, housing, inclusion of migrants and refugees, and urban poverty) (EU 2015). The EU Urban Agenda promotes vertical and horizontal coordination of policies, impact assessment and knowledge exchange.

A question remains: are cities equipped to contribute effectively to global sustainable development and in particular make use of their urban planning and design functions, as global political players want them to?

**Cities: Key Player in Urban Planning and Design for Health**

Cities can foster context-relevant cross-sector, multi-actor partnerships to consider the urban future, which can lead to an emotional engagement of various stakeholders (Government Office for Science 2016). As seen in previous sections, cities are major contributors to global, environmental and human health issues. This justifies their full involvement in reassessing city living and contributing to a reduction in the health inequalities so embedded in the urban system. City planners have the power to influence city dwellers’ healthy behaviours by encouraging car-free developments, and to promote inner city living by embedding healthy planning principles in their local plans and masterplans.

Implementation gaps still remain, though, for a number of reasons linked to political inability, or reluctance, to establish the right governance structures and effective policy frameworks or to regulate the market. For instance, economic power might remain with private developers who are able to negotiate a watering-down of healthy features of the built environment. Healthy planning principles might not yet be embedded into planning processes, limiting planners’ ability to negotiate with private developers. Impact assessment methodologies might not consider the impact of new developments on health in systematic ways (e.g. Carmichael et al. 2012, 2013, 2019 in the English context). In the field of air quality, management measures are in place in a growing number of countries and cities, often in response to regulatory measures, for example EU directives and legally binding conventions. However, in too many places, several important gaps remain in the quality and quantity of indicators that are monitored. Additionally, advances in air quality remain limited, with cities, regions and nations reluctant to steer economic growth towards more sustainable patterns owing to fears of a slowing down of the economy.

Some positive signs have started to emerge in the last two decades, including city initiatives, spearheaded by visionary leaders, cross-sector or multi-sector partnerships, use of health impact assessment and the wealth of organizations offering principles and criteria guiding local planners and designers towards healthy cities.

Many domestic policies with a health or environment dimension will now be cross-sectoral and multi-level (including education, transport, planning, housing, waste, energy, immigration and the economy, for example). National urban policies need to suit local circumstances and territories as well as economic development. There are good examples of cities which integrate and coordinate services, infrastructure and policies if they want to meet their ambitions for sustainable development. This comes from the learning from systems thinking. Of course, whether they can deliver more complex models of governance will also depend on a number of factors including fiscal autonomy, leadership and citizens’ engagement. Sweden and Norway have great fiscal power, which allows
them to identify strategies and policies. The UK remains very centralized, and cities remain strongly
dependent on grants from central government in recognition that local government is a creature of
Parliament. However, crowd funding has emerged as a new form of project financing at city level,
and Liverpool and Manchester have benefited from it to improve, for instance, pedestrian accessibil-
ity to the city.

City leadership and mayoral power are a key asset for delivering a liveable city for its citizens
(Acuto 2013). But it first requires mayors to openly acknowledge social fractures and focus on
addressing poverty and inequity rather than see their role as one of public relations and promotion
to the rest of the world, ignoring internal problems. ‘No Mayor stands up and says, “I represent an

The city of Copenhagen has led the active travel field. While the focus on urban and transport
planning has helped deliver a cycling city over the past few decades, strong political leadership and
commitment from lord mayor Ritt Bjerregaard spearheaded the initiative originally. Copenhagen
hit the headlines when in November 2016 bikes outnumbered cars for the first time in the city since
traffic counting started, in 1970 (Cathcart-Keays 2016). Michael Bloomberg, when mayor of
New York, led the redevelopment and pedestrianization of the High Line, offering a green route at
the centre of the city.

Copenhagen, Malmo, Stockholm, Bristol and Ljubljana have used the European Green Capital
approach, through a comprehensive set of environmental indicators, to promote their environ-
mental credentials, innovation and cross-sector partnerships (European Commission—Directorate-
General for Environment 2017). Copenhagen’s success in the green economy is founded, amongst
other key drivers, on its compact urban form and environmental policies but also on its public–
private partnerships and ability to develop and attract skills (LSE Cities 2014). Hammarby Sjöstad
in Sweden is an eco-town that implemented innovation and partnership building for climate action
with health benefits by integrating resource, transport and building infrastructure in its masterplan
(Pandis Iverot and Brandt 2011) and promoting a compact city approach. The local authority drove
up standards, running competition between developers and requiring high quality in design and
environmental performance (Atelier Groenblauw 2017). In the UK, the NHS England Healthy
New Towns programme promotes multi-sector partnership, including close cooperation between
local public health teams and planners.

The local sustainability agenda is also of key interest to the private sector. Siemens for instance
collaborate with C40 Climate Leadership Group (Government Office for Science 2014). Reduction
of greenhouse emissions, toolkits for resilient cities and urban planning for city leaders, and green
city indexes have started to emerge. With the emergence of green technologies, on the demand side,
cities offer opportunities for urban services, lifestyle and asset capitalization. On the offer side, they
are an ideal ground for the private sector’s innovation and research and development strategies and
product innovation and loci for delivering corporate social responsibilities.

Cities furthermore offer a direct link between the elected elite and citizens and residents. Strong
community participation can ensure the effectiveness of a healthy city agenda (Hancock 2018).
Beyond traditional modes of consultations, social media are now encouraging aspects of direct
democracy. In the built environment, this can mean opportunities for ‘guerrilla urbanism’ and crowd
funding. Big data, through use of mobile technology, means that citizens can be engaged in data
gathering around behaviour and mobility in the city, even if it brings some methodological conun-
drums, including privacy and the level of comprehensiveness of the data collected.

**Conclusion: The Future Is Urban**

By putting great demand on energy, material, water, ecological and food systems to deliver their
economic and social ambitions, cities are a key dimension of a system of natural and human resources
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that affects the environment and human health. Public health paradigms now place the socio-ecological model of health within the context of the planetary boundaries and ecosystem services, and offer an increasingly comprehensive set of criteria allowing quantification of the health impacts and policy actions to address environmental stressors at city level.

Evidence has also developed in recent decades to illustrate how the urban fabric and the physical form of the built environment can impact on health and health equity: in particular, evidence is emerging linking green space, housing quality and affordability, streetscapes, accessibility and connectivity to physical, mental and environmental health and equity. Planning and urban design research has identified sets of qualitative urban planning principles that can contribute towards the creation of healthy urban environments.

The evidence base shows how cities are critical for tackling the dual challenges of climate change and health, but only political commitments and policy mechanisms can ensure that good planning principles are encouraged or required. Thankfully, cities are now seen as key economic, social and environmental players, entrusted by international policy actors to deliver SDGs and an urban agenda for sustainability, health and wellbeing through their urban planning, design and related built environment functions. City leaders are best placed to set priorities, and foster the right resources to deliver climate action with health benefits. Addressing the broad determinants of health in cities will require an alignment of agendas for place, poverty, inequality and the economy, and cross-sector working in particular between public health and urban planners.

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