Chapter 12
Planning for Healthy Cities

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12.1 Planning for Healthy Cities

A document submitted by the WHO to the United Nations Conference on Housing and Sustainable Urban Development, Habitat III, in Quito states that 'Healthy urban policies can significantly reduce infectious and non-communicable diseases and enhance wellbeing' (WHO 2016, p. 4). I take this as an indication that the role of the built environment in addressing the wider determinants of health, in addition to its accepted role on addressing infectious disease, is now well evidenced and is starting to be accepted. Cities are being pushed to the front of the call for action on health (WHO-UN 2016). Despite this, good practice exemplars of cities *deliberately* using a comprehensive approach for policy and practice to provide healthier urban environments are not common.

The focus of this chapter is urban form, the processes that control it and its influence on supporting health and health equity for non-communicable diseases and enhanced wellbeing. Planning for healthy cities needs to cover two public health objectives;

- firstly, the control and reduction of 'what is bad for people's health', such as exposures to air pollution, noise, heat; and
- secondly, providing support for the creation of, and access to, 'what is good for people's health' such as good quality green space, inclusive communities, healthy food and options for everyday activity.

The overall goal being to support long healthy lives for all. But to what degree does urban form matter? A recent study covered five international exposure recommendations across these two objectives. It looked at compliance with recommenda-

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tions for physical activity, air pollution, noise, heat, and access to green spaces. The study quantified the associations between exposures and mortality to estimate preventable premature deaths. It is estimated that annually almost 20% of premature mortality could be prevented if international recommendations were complied with (Mueller et al. 2017).

With such a complex subject, this chapter can only aspire to give an introduction. My intention in writing the chapter is to provide an orientation, key concepts, some useful frameworks and tools, a scattering of examples, references to useful texts and examples of relevant research and activity.

The chapter starts with an overview as if planning for healthier cities was a game. What is the goal and what are the rules of this game, what does the playing field look like and who are the players? There is next an outline of planning for healthy cities in the WHO European Healthy City Network, a look at the relevance of the Sustainable Development Goals and a review of health equity and city planning. In the next section, some of the main elements and drivers of city development are outlined, including patterns of development and the importance of the planning system, concluding with a logic framework for an integrated city planning process for health. The next section provides an overview of how city form influences risks and challenges to health.

The following two sections look in more detail at actions that can be taken at two scales, strategic city planning and place-making. Strategic planning includes discussions of growth patterns and sprawl, strategic processes and climate change. The local planning section looks at place-making, the neighbourhood scale and the importance of involving communities. The chapter concludes by drawing together some of the main threads, in particular spatial leadership for health, and co-generating new knowledge and healthier places for more effective action.

12.1.1 Playing the Game: Rules, Tactics and Strategy

The nature and strength of the rules will vary according to the local context. Many policies influence city planning in addition to spatial planning policy per se. In response, the strategy, tactics and game play will need to be determined by local stakeholder players. In many cases, city planners may see their role as umpires. The best of these umpires will need to see rules adopted that to allow for a high level of consensus building, transparency and participation, so that everyone wins (Grant and Barton 2013).

All elements of planning for health need to be covered as a complete package. Such an approach was adopted in a WHO document setting out the 12 principles of Healthy Urban Planning in 2000 (Barton and Tsourou 2000). Table 12.1 shows the suggested schema; this has been adapted to better cover some important determinants of health that were not covered in the original, namely, biodiversity, food issues, and energy and waste (as resources).

Table 12.1 The 12 objectives of Healthy Urban Planning

Do planning policies and proposals promote and encourage health through:	
Supporting healthy personal lifestyles?	Providing safety and the feeling of safety?
Promoting social cohesion and social capital?	Supporting equity?
Providing quality housing?	Ensuring good air quality and a high-quality visual environment?
Access to work?	Adopting a sustainable approach to water, sanitation and drainage?
Access to local facilities and services?	Wise use of land and resources and support for biodiversity?
Promoting access to local, sustainable food and food production?	Addressing climate mitigation and adaptation issues?

Source: Adapted from Barton and Tsourou (2000)

12.1.2 The Playing Field

This game of planning for health is played on the playing pitch of people's lives in urban areas. At whatever scale you set up the game, city region, district or neighbourhood, the pitch has a fuzzy boundary; it is affected by nearby games in other urban areas and by other far away games that influences its resources, economics and politics. The 'HealthMap' (Fig. 12.1) is a useful metaphor for playing field and indicates that there are consequences for planetary and individual health of any intervention.

The HealthMap places people and their health at the centre with planetary health as the global context. In six concentric arcs, from individual lifestyle to the natural urban environment, it captures urban components of the determinants of health. The three outer arcs are rendered in a darker colour to highlight the core locus of operation for those actors who intervene directly in the built environment. The HealthMap is a systemic tool. Treat any definitions of components as loose and all implied relationships as fluid; in each application stakeholders need to reassess the relevance of the map to their local situation. For planning a healthy city, each of the arcs can be translated into specific and measureable objectives (Table 12.2).

Knowledge in this field is rapidly developing. Research points to the potential of using multilevel ecological models of public health, to better understand physical environment effects on health and health equity (McLeroy et al. 1988; Sallis and Owen 2002; Hanlon et al. 2011; Vardoulakis et al. 2016). The validity of using complementary scientific approaches needs to be recognised; and the understanding within cities of what works and why it is an essential ingredient (Pawson and Tilley 1997). Disparate stakeholders have found that the HealthMap can be a useful device for negotiating, understanding and developing a consensus for action.

There has recently been further discussion of the wider societal determinants of health in reaction to a narrow 'personal lifestyles are to blame' approach to solving public health problems. An integrative review of frameworks that focus on social determinants and lifestyles as 'bridging' concepts between the fields of public health and environmental sustainability is useful in this context (Graham and White 2016). The review found that frameworks which included human health as an

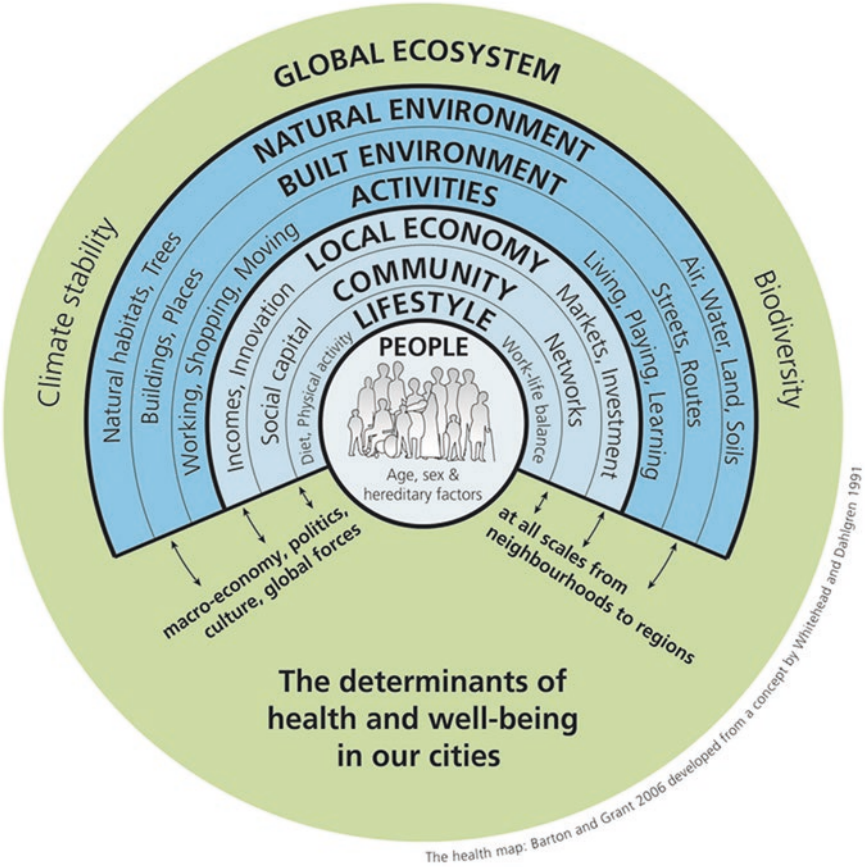

Fig. 12.1 The HealthMap as playing field: the determinants of health and wellbeing in our cities. Source: Barton and Grant (2006) developed from the model by Dahlgren and Whitehead (1991)

outcome also supported a combined public health and environmental sustainability approach (Fig. 12.2). This logic model provides another useful way to understand the route from social determinants to human health.

12.1.3 The Players

Using planning to achieve healthier cities occurs at the intersection of two disciplines. Although having a history of collaboration, and having common roots, the two disciplines have built-up working practices that make joint working difficult (Arthurson et al. 2016). A simple caricature of the two disciplines would be:

Public health: Population level interventions focused on people.

Planning: Population level interventions focused on place.

Table 12.2 Linking the HealthMap to urban planning objectives

Arcs of the HealthMap	Objectives for Healthy Urban Planning
1. People	• Providing for the needs of all groups in the population • Reducing health inequalities • Involving people in supporting a healthier local environment
2. Lifestyle	• Promoting active travel • Promoting physically active recreation • Facilitating healthy food choices
3. Community	• Facilitating social networks, social cohesion and inclusion • Supporting a sense of local pride and cultural identity • Promoting a safe environment
4. Economy	• Promoting accessible job opportunities for all sections of the population • Encouraging a resilient and buoyant local economy
5. Activities	• Ensuring retail, educational, leisure, cultural and health facilities are located to be accessible to all • Providing good-quality facilities, responsive to local needs
6. Built environment	• Ensuring good quality, variety and supply of housing • Promoting a green urban environment supporting mental wellbeing and contact with nature • Planning an aesthetically rewarding environment, with acceptable noise levels
7. Natural environment	• Promoting good air quality • Ensuring security and quality of water supply and sanitation • Ensuring soil conservation and quality • Reducing risk of environmental disaster
8. Global ecosystems	• Reducing transport- and building-related greenhouse gas emissions • Improving city and city region support for global biodiversity

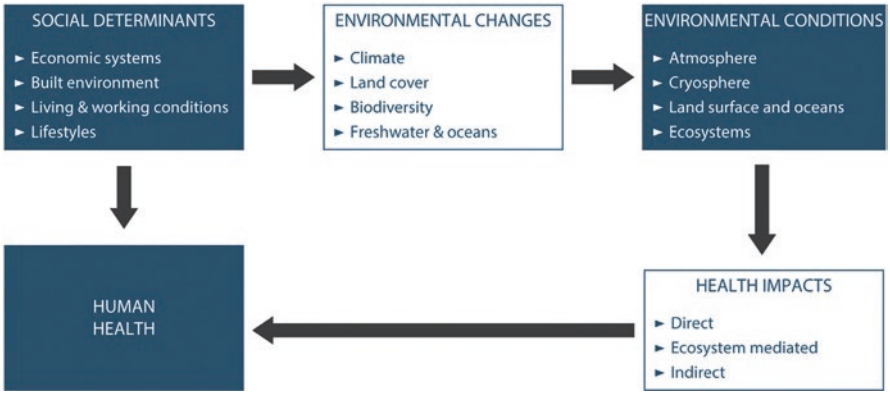

Fig. 12.2 Social determinants: environmental and health outcomes. Source: Graham and White (2016)

Of course in reality, public health can be concerned with place and environment, but in other instances having just a narrow focus on the individual and planning in many quarters see its purpose as places for people, but in other quarter it focuses entirely on serving economic market-led goals. However, 'planning for healthy cities' can allow each of these traditions to play to their strengths, reaffirm their roots and at the same time respond to current and future challenges (Barton 2009). In public health, at its best this agenda calls for the expression of a 'Health in All Policies' approach (Leppo et al. 2013) and also supports a call for 'Asset-Based Community Development' (GCPH 2011, 2012). Planning for healthy cities has a strong part to play in integrating the four levels of health promotion: environmental, social, organisational and individual (Kelly et al. 1993). It also can be a building block in the development of the fifth wave of public health (Hanlon et al. 2011). The fifth wave of public health sees emergent qualities that relate well to whole city planning such as recognising the need to deal with complex adaptive systems; maintaining a supportive, creative and cooperative mind-set; and a rebalancing of orientation to integrate objective science with 'the subjective' (lived experience, inner transformation) and 'intersubjective' (shared symbols, meanings, values, beliefs and aspirations) (Kelly et al. 1993).

In terms of the culture of planning, 'planning for healthy cities' strengthens collaborative planning (Healey 1996, 2003), placing process at the centre, with 'public goods' for both people and the environment as an objective. It can help to rebalance spatial planning, moving it away from the recent dominance of a market orientation and placing people and communities at the heart of planning again. There is a history of value propositions sitting at the heart of both these realms of human activity: public health and planning. In both too, there is an opposing force that claims of 'objectivity' and value free action. Choosing to adopt a healthy city approach is unashamedly value based (de Leeuw 2017).

12.1.4 Planning for Healthy Cities: The World Health Organisation European Healthy Cities Network

An approach for using the physical planning and design of cities was specifically developed within the WHO European Network of Healthy Cities. This initiative began in 1988 and is still continuing today, with Phase VII launched in 2018. Each phase lasts about 5 years, with cities across the WHO European region eligible to apply phase by phase. At the end of every phase, an evaluation helps to guide the development of the themes and develop working practices for the next phase (Belfast Healthy Cities 2014).

Phase I (1988–1992) involved 34 cities with the goal of introducing new ways of working for urban health based on a whole city approach. Phase II (1993–1997) included 38 cities. It was more action-oriented, with a strong emphasis on healthy public policy and comprehensive city public health planning. Phase III (1998–2002)

saw talk of a 'European Healthy Cities movement' with 55 WHO designated cities and also national networks in several countries for non-designated cities. Moving towards a more strategic health development approach, it focused on constructing intersectoral city health development plans. This was intended to promote strategic planning for health across different sectors at city level. The Healthy Urban Planning approach emerged in one of the four themes: transport, environment, planning and housing. The other three themes were integrated information, lifelong learning and mental health and young people. The 12 objectives of Healthy Urban Planning were first used within this phase. Cities who wanted to focus on healthy urban planning formed a subnetwork and evaluated their experiences of the approach (Barton et al. 2003). This helped embed 'integration' and 'co-operation' as a key principles within the next phase.

Phase IV (2003–2008) saw consolidation of this spatial approach, and 'Healthy Urban Planning' became the name of an identified theme, with a thematic subnetwork of cities meeting regularly. Almost 100 designated cities joined this phase. The other three themes were healthy ageing, health impact assessment and physical activity and active living. Across all themes was an emphasis on equity, tackling the determinants of health, sustainable development and participatory and democratic governance. Work continued under a 'Healthy urban environment and design' theme in Phase V (2009–2013) (WHO EURO 2009). Phase VI (2014–2018) encompassed two strategic goals: improving health for all and reducing health inequities and improving leadership and participatory governance for health. A spatial approach was nested within 'creating resilient communities and supportive environments' one of the four core themes.

The evaluation of Phase V showed that well-designed interventions in the field of urban planning, transport or housing could all be very effective at meeting multiple objectives, addressing several of the Healthy Urban Planning objectives in a single intervention (Grant 2015). It also showed that the cities involved were using both strategic Healthy Urban Planning and local participatory neighbourhood design initiatives to tackle the health equity issues they had identified.

12.1.5 Sustainable Development Goals and Healthy Urban Planning

On 25 September 2015, the United Nations General Assembly formally adopted the 2030 Agenda for Sustainable Development, with a set of 17 Sustainable Development Goals (SDGs) and associated targets. A cursory glance at the 17 SDGs shows health to be the concern of SDG3 'good health and wellbeing'. Health advocacy in the global processes leading to the development of the SDG goals (from the Millennium Development Goals) focused. On 'maximising healthy lives' through reducing the burden of major non-communicable diseases, ensuring universal health coverage and access and accelerating previous commitments (Anon

2013). Concern has been expressed that through this process and under the weight of many pressing global concerns, health objectives will be weakened. Remedies suggested by Hill et al. (2014) include reframing health in terms of social sustainability and relating health to the whole sustainable development agenda; recognition that action for health cannot be limited to SDG3 is spreading (WHO 2017) with SDG11, cities, and SDG17, partnerships, just two from many others that are relevant.

The message of this chapter is the influence of the built and natural urban environment on how people choose *or are obliged* to live, to move and to consume in the places they live (i.e. people's lifestyles). Through this route, urban environments affect personal health and well-being. In addition, these environments we create and the lifestyles they promote, both affect the wider ecological processes and systems on which everyone relies for health and wellbeing (i.e. many other aspects of sustainable development); refer again to Fig. 12.2. Using urban planning to address health provides an approach that can link the two agendas: health and sustainability. Implementation and processes for Healthy Urban Planning are very close to those required for sustainable cities and towns. As a consequence, urban planning for health resonates across several other SDGs in addition to SDG3 'good health and wellbeing', including:

SDG8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

SDG7: Ensure access to affordable, reliable, sustainable and modern energy for all

SDG11: Make cities and human settlements inclusive, safe, resilient and sustainable

SDG12: Ensure sustainable consumption and production patterns

Sustainable Development Goals can and should be used as a policy spur for healthier planning.

12.1.6 Health Equity and City Planning

Spatial planning and design has a role to play in reducing health inequities. SDG10,'reduce inequality within and amongst countries', contains seven targets for reducing inequalities, and health equity targets are often embedded into national health policy. The capacity of local environments to support health is of particularly importance for population groups disadvantaged by relative poverty, unemployment, low status and disability. Those who, for financial, physical or cultural/racial reasons, are more vulnerable, and have fewer choices open to them, find themselves typically in locations and settings that are less conducive to good health with little ability to move away or gain respite from unhealthy working and living environments. Many features of the built environment that detract from health are more likely to be experienced in areas of socio-economic disadvantage (Jones and Yates 2013). An outline of spatial factors that can exacerbate health inequity is found below.

12.1.6.1 Transport

In children aged 5–19 years, unintentional injuries are the leading cause of death, the majority of these being a result of road traffic collisions (Peden 2008).

There are very wide socioeconomic differentials in the levels of death and serious injury from road traffic. A study in England showed that children in the most deprived 10% of areas are four times more likely to be hit by a car as children in the least deprived 10%. Traffic-related issues affecting health such as poor air quality and noise also disproportionally affect those living in disadvantaged neighbourhoods (WHO 2007, 2011b). There is also now sufficient evidence to support an association between the exposure to traffic-related air pollution and the development of childhood asthma (Khreis et al. 2017).

12.1.6.2 Neighbourhoods and Facilities

Access to local facilities such as shops, schools, health centres and places of informal recreation is important for health and well-being both for the exercise taken in getting there (generally) on foot and the social interaction en route or at the facilities (Croucher et al. 2007). This is particularly important for lower-income groups who get much of their physical activity from active travel rather than leisure time recreation. Deteriorating features of an urban environment such as dilapidation, vandalism, graffiti and litter are disproportionately found in disadvantaged areas with a corresponding loss of amenity for walking to be pleasurable. In such areas children are less likely to be let out to play, leading to reduced physical activity and exacerbating health problems such as obesity which is more prevalent in lower-income groups. A cross-sectional survey of 12 European cities found that, compared to respondents from areas with low levels of litter and graffiti, those from areas with higher levels were 50% less likely to be physically active and 50% more likely to be overweight (Ellaway et al. 2005).

12.1.6.3 Local Shopping Streets

A high density of cheap, fast-food outlets can contribute to health problems, particularly those associated with obesity, for example, type 2 diabetes, hypertension and coronary heart disease (Robinson 2004). In the United States, it has been estimated that up to 10% of children's total energy intake now comes from fast foods, compared to 2% in the late 1970s. This increase in fast-food intake amongst children is significantly contributing to the rising childhood obesity in high-income countries (Bowman et al. 2004). Townshend (2017) talks of 'toxic high streets' found especially in low-income neighbourhoods with a concentration of retail outlets that could present a risk to health such as betting shops, discount alcohol, vaping emporia, pawn shops and pay day lending, take-away food and tanning salons.

12.1.6.4 Green Space

Inequality in mortality is lower in populations living in the greenest areas. Evidence shows that populations that are exposed to the greenest urban environments also have lowest levels of health inequality, accounting for income deprivation (Mitchell and Popham 2008). However, green space is not equally available to all of the population, with poorer neighbourhoods often lacking green space or with poorly maintained or vandalised green areas. Benefits of increases in physical activity and improved mental health only arise where the green space is high quality, accessible and safe (Ward Thomson et al. 2016; WHO EURO 2016).

12.1.6.5 Inequity of Climate Change Impacts

There are two particular aspects of climate change, influenced by the built environment, which are likely to impact disproportionately on the disadvantaged:

Increasing temperatures: exposure to heat is a cause of morbidity and mortality in the urban environment with lower socio-economic and ethnic minority groups more likely to live in warmer neighbourhoods and suffer greater exposure to heat stress (Harlan et al. 2006). High residential densities, sparse vegetation and having little or no open space, all often found in poorer neighbourhoods, have been correlated with higher temperatures.

Flooding: urban flooding from sea level rise and fluvial inundation presents an increasing risk to health through drowning, injuries, infectious diseases, stress and loss of essential services. The effects of flooding can be particularly devastating to already vulnerable populations, such as children, older people, the disabled, ethnic minorities and those with low incomes (WHO 2003). The disadvantaged may also live in more vulnerable areas; a study in England found there were eight times more people in the most deprived decile living in the tidal floodplain compared to the least deprived (Walker et al. 2003).

12.1.6.6 Developing a Strategic Focus on Health Equity

An evaluation of Phase V of the European Healthy Cities Network demonstrated that health equity could be addressed project by project or could be absorbed into the way a city conducts its spatial and transport policy (Grant 2015). The main subgroups targeted were older people, children, residents living in disadvantaged neighbourhoods and cultural minorities (Grant and Lease 2014). Health equity checks can be made part of policy and project impact assessment. In Whitechapel, London, the local masterplan's Sustainability Assessment included an Equality Impact Assessment which identified lower life expectancy and vulnerable groups, including minority ethnic groups and those with ill-health, as a key inequality issue and recommended actions to reduce inequalities (LBTH 2006). These included improving outdoor space and indoor leisure facilities to make them inclusive. In

Ljubljana, Slovenia, a member of the European Healthy Cities Network, they have developed a comprehensive and systematic city-wide approach to improve accessibility for disabled citizens. Measures include changes to the physical environment, as well as to public services, public transport, information, communication and the cultural and recreation sectors (Grant and Lease 2014).

12.2 City Development and Its Drivers

Rapid, unplanned, unsustainable patterns of urban development combined with continuing population urbanisation have always made cities in the developing nations focal points for environmental and health hazards (WHO 2002). Public health issues of waste disposal, provision of safe water and sanitation and injury prevention are familiar issues at the interface between urban inequalities, local environments and health.

Economic development has often been hailed as essential in a package of solutions to these problems. However, a rise in non-communicable disease and weakening of the determinants of health is emerging in the urban settlements in high-income countries. Diseases associated with sedentary lifestyles or poor-quality food intake on the one hand and increasing gaps in health inequalities, loss of social cohesion and support networks on the other are gaining public health focus in the developed cities in high-income countries. Worryingly some commentators are finding that a rise in these non-communicable health risks is now compounding the more frequently encountered communicable disease risks found in the informal of many low- and middle-income countries (Oni and Unwin 2015; Oni et al. 2016).

12.2.1 City Development

The idea of a rationally designed master plan for a city or urban area being delivered on the ground is a notion that non-built environment professionals sometimes hold in their mind as to how towns and cities develop. Although this is not unknown, it is a rarity, and such as the spatial process of development does not in itself even predict a successful place to live. City development patterns, as found and lived 'on the ground', result from an interplay of many drivers. Distribution of land use function (such as housing, employment, retail or mixed-use) plus the separation or mixing of these functions is a strong determinant of health. Three key influences on spatial patterns are:

Territorial context: Place; geography and geology, natural features, scale of development, patterns of ownership of land

Processes and drivers: Market and economic forces, land values, urban population growth, public investment, community interests, public involvement

Spatial policy context: Local, regional and national planning policy. Other sectoral plans (such as protected areas, catchment management and transport) that can influence development, the nature of the spatial planning system itself

These influences are non-exclusive and are interdependent. They can give rise to a plethora of spatial development patterns even within the same city. An examination of the features and driving forces of development in Hangzhou, China, found three patterns of development within the category of urban sprawl alone: infilling, edge development and leapfrog growth (Yue et al. 2013).

12.2.2 Spatial Planning Systems

The nature of the planning policy context provides important context. Different countries have very different spatial planning systems, stemming from different traditions influencing how planning happens. These styles of planning are deeply embedded in the complex historical conditions and cultures of particular places (Nadin and Stead 2008). The EU Compendium of Spatial Planning Systems and Policies (1997) used a set of criteria to discern idealised types or traditions of spatial planning. These criteria were:

- Legal family context
- Scope of the system in terms of policy topics covered
- Extent of national and regional planning
- Locus of power or relative competences between central and local government
- Relative roles of public and private sectors
- Maturity of the system or how well it is established in government and public life
- Apparent distance between expressed goals for spatial development and outcomes

Variations in these criteria give rise to four 'idealised' planning types: comprehensive integrated, land use regulation, regional economic and urbanism. However, Nadin and Stead acknowledged that each country will display its own unique variations on these idealised types. In addition to influencing that way that health can be incorporated into planning, these differences need to be examined if attempting any kind of learning or comparisons using international case studies (Grant 2015).

12.2.3 An Integrated City Planning Process for Health

So if the form and nature of the urban environment are critical to urban population health, how do we attempt to modify existing places or create new ones? Certainly we need to join forces with local communities and use local data. Using spatial planning and urban design to achieve health and health equity outcomes can be enacted as one or more isolated activities or projects or can be nested within a holistic healthy cities approach (Grant 2015). This agenda can be addressed at any

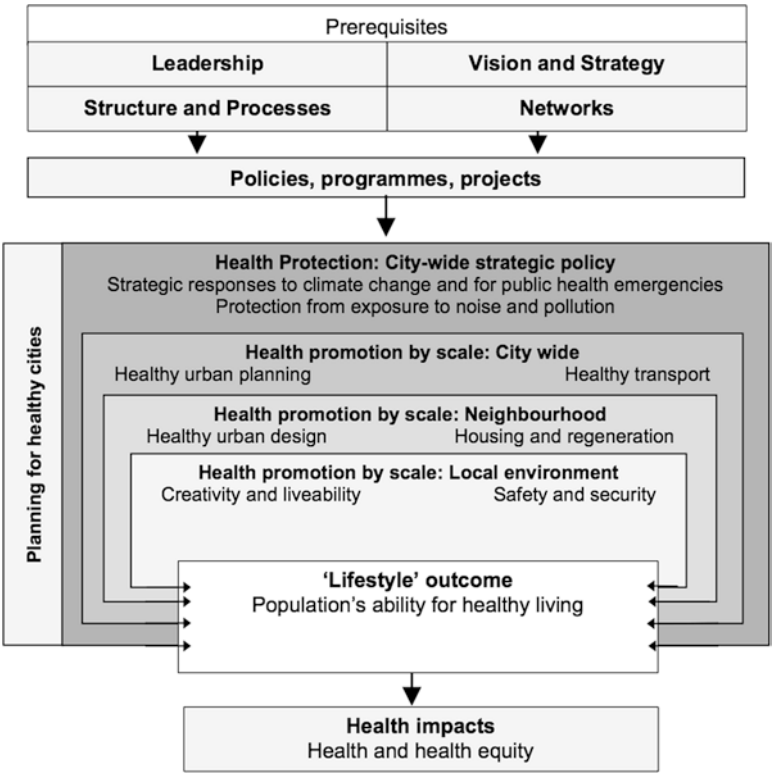

Fig. 12.3 Planning for healthy cities: modifying lifestyle outcomes. Source: Adapted from Grant (2015)

scale, from building and street, home-patch and neighbourhood to district, city and city region. Pivotal to success is an understanding of the multilevel context; prerequisites such as leadership and vision; different modes of working such as through policies, programmes or projects; and the different scales of working that can be employed (Fig. 12.3). Scale as an important factor in planning for health is slowly being recognised (Garfinkel-Castro et al. 2017). Planning for healthy cities is best addressed at all scales simultaneously, potentially triggering a health in all policies approach.

Planning for healthy cities must comprise of both health protection, usually city-wide policy through licensing, regulation and standards, and health promotion. Health promotion itself can be broken down into city-wide spatial policy for Healthy Urban Planning and transport, neighbourhoods scale activity such as urban design and housing and promoting innovation, liveability, safety and security at the local level. All of this should be directed towards an outcome that supports people's ability for healthy living across different sub-groups, with the goal of health and health equity.

12.3 City Form and Non-communicable Disease

The fabric of our towns and cities is the outcome of the way we plan, design and manage the territory of places, spaces, facilities and buildings of our urban habitat impacts on health from both a positive and negative perspective (RCEP 2007; Rydin et al. 2012). This physical form of an urban area includes the different land uses, where they are located in relation to each other and how they are distributed. This encompasses size, configuration and the nature of both human-built environments and natural features. However, the form is not immutable. Even in the most developed cities, there is room for manipulation and change to benefit health, as experience has shown through decades of remodelling to reduce the dominance of private motorised transport and increase the modal share of cycling and walking in many European cities.

The evidence base demonstrating associations between spatial urban form and the health outcomes is disparate and voluminous. Due to different urban patterning and spatial planning systems, much knowledge is location specific and not transferable. For some urban characteristics, causality has been found or inferred. But it is those characteristics of urban form that can be influenced by planning and design, which need to be the focus. Evidence of risks and challengers to health in urban environments from a spatial planning perspective (Grant et al. 2009) is presented here as a matrix linking parameters of urban environment to five risks to health (Table 12.3).

Risks to health such as air pollution, noise exposure, physical activity levels, social impacts and pathologies and unintentional injuries are all associated with urban elements that are open to manipulation (Grant et al. 2009; WHO 2016; Ewing and Cervero 2010; Barton 2009).

Four urban elements have been selected as they represent broad areas for urban policy and spatial intervention. At the strategic scale, we have what is termed ‘land use pattern’, straddling strategic to local we have ‘transport’ and ‘green space, and at local scale we have ‘urban design’ (Fig. 12.4).

Transport infrastructure and the land use pattern are interdependent. The existence of transport networks affects the pattern of accessibility which helps deter-

Table 12.3 Urban elements as spatial determinants of health

Risk and challenges to health	Urban elements to manipulate			
	Land use pattern	Transport	Green space	Urban design
Physical activity	**X**	**X**	**X**	**X**
Social impacts	**X**	**X**	**X**	**X**
Air quality	**X**	**X**	**X**	**X**
Noise exposure	**X**	**X**	X	X
Adverse microclimate	X	X	**X**	**X**
Unintentional injuries	X	**X**	O	X

Main interactions between the urban components and risks and challenges to health. Source: Adapted from Grant et al. 2009

X = major interaction, X = minor interaction, O = very little interaction

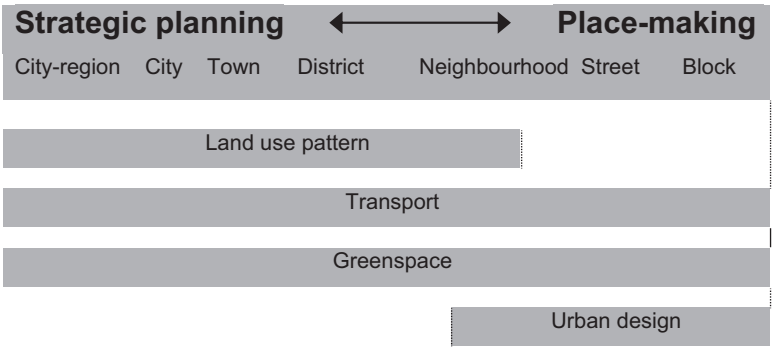

Fig. 12.4 Coverage of urban scale by components of the urban environment. Source Grant et al. (2009)

mine where land use development occurs. The pattern of use determines movement patterns, which in turn triggers demand for extra transport provision.

12.3.1 Land Use Pattern

In most settlements, the land use pattern results from the decisions of a myriad of land owners, in a context of market forces, mediated or not and to varying degrees by a spatial planning system. Spatial planning policies separating uses into different areas (zoning) or large area spatial designs (masterplanning) can have a profound effect on the land use pattern.

Land use pattern comprises the nature, disposition and density of land use. Issues of layout, networks, connectivity, accessibility, distribution and availability of facilities and functions are influenced. In terms of impacts on health, we can discern impacts at a series of distinct but nested scales. These are the region, city, town, district and neighbourhood scales. Several commentators discuss the general evidence of the impact of land use patterns on health (Lavin et al. 2006; Rao et al. 2007; Barton 2009). There is also evidence of significant health impacts at the smaller spatial scales of the street, the block; these are outlined in the section on 'urban design'.

12.3.2 Transport

This refers to the transport infrastructure, public and private, for all modes of movement. At the larger scales, this encompasses rail, road and water connections between a city and its hinterland and between a city and other cities. At the smallest scale, this may be the nature of how side streets meet main roads, of residential pavement management and of domestic cycle parking. Each of these has its own

impact on the wider determinants of health. Transport policy and infrastructure investment is usually determined by transport specialists, often all too weakly coordinated with other aspects of strategic spatial planning.

12.3.3 Green Space

Green space confers many benefits for both physical and mental health and wellbeing (Mass et al. 2006; Ward Thompson et al. 2012) and is a critical component for urban health (Nieuwenhuijsen et al. 2017; Brown and Grant 2005; Coutts and Hahn 2015). Urban green space includes a huge variety of land from country parks and river corridors running through cities to residential gardens and pocket parks. It includes land in public, commercial and individual ownerships. It includes a wide range of uses including public and private gardens and squares, amenity and sports open space (often associated with mown grass), play space (often associated with shrubberies and mown grass), river and canal corridors and movement greenways and other functional green space such as allotments, churchyards and cemeteries. It comprises natural and seminatural habitats (including derelict and previously developed land) and managed verges, parks and gardens. In some settlements, this broad category could also include remnant countryside now within urban boundary such as woodlands, cliff ridges and coastlines. Green space is also taken to include elements of urban nature, not necessarily connected with a designated land use, such as street trees, vegetated walls and green roofs. As such responsibility for urban green space is usually spread across several departments in a municipality, including those responsible for civic amenity and parks, biodiversity and nature conservation, public housing, street trees and allotments, ownership and management may be in private hands.

Increasing the urban green space is an adaptive and also a mitigating response to climate change, reducing heat island effects. Presence or absence of trees and vegetation which cool areas through shading and evapotranspiration is important (Gartland 2012). Climate change mitigation also occurs through urban tree planting in colder climates due to increased wind friction with the potential to reduce heat loss from residential areas in winter. Urban heat island reduction policies should specifically target vulnerable residential areas and take into account equitable distribution and preservation of environmental resources (RCEP 2007). The progressive greening of cities is critical across a number of health objectives.

12.3.4 Urban Design

The way we experience and use our immediate environments in towns and cities is determined at the smaller spatial scale of the street, the public square, the development block and individual buildings (Rao et al. 2007). This includes much of what

is referred to as 'the public realm', the work of landscape architects and urban designers, but strongly influenced by the form and facades of architecturally designed buildings and the decisions of those designing roads. Urban design can also determine the degree of social mixing or segregation of communities through the locational control of social housing in new build and neighbourhood regeneration.

Urban areas will also have to adapt to climate change. When designed correctly buildings have a reduced need for mechanical air conditioning in areas with lower external ambient temperatures. In more dense urban areas, decentralised energy distribution systems, such as combined heat and power and community heating networks, which can contribute to climate change mitigation (Barton et al. 2010) become more viable. The nature of the urban materials contributes to urban heat islands (Gartland 2012). Buildings, tarmac and paving absorb and store heat, increasing air temperature, particularly noticeable at night. To moderate temperature then the essential parameters are surface roughness, colour and porosity (all affecting albedo characteristics).

12.4 Strategic Planning: Working the Whole City

Strategic planning may be formulated through plans setting out a vision or objectives for the next 10, 20, 25 or more years for a city or city region. Work at this scale is often an attempt to determine broad future spatial patterns for investment including for employment, housing and transport. Plans may also include resource strategies including for energy, waste and water.

12.4.1 Growth Patterns and Urban Sprawl

Development pressures in urban areas are often acute, with demand for housing and employment outstripping supply. At a strategic planning level, the resolution, in terms of settlement growth, can been categorised into a number of archetypal spatial patterns relating to strategic policy. Different strategic policy results in different spatial patterns of development. Some idealised types of strategic policy and their resultant spatial development patterns are given in Table 12.4.

The impact on health cannot be wholly predicated at this strategic scale. Even the outcomes of the compact city option, often advocated for sustainability and quality of life, may be adverse for health and health equity if urban design and governance at the micro-scale are poor. Outcomes are always dependent on the local context. However low-density 'urban sprawl', which is market driven and often occurs if strategic policies are not implemented or are weak, has been shown to damage health (Lavin et al. 2006; Frank et al. 2012).

Table 12.4 Strategic urban growth policy and resultant spatial patterns

Strategic urban growth policy	Resulting spatial pattern
Intensification: infill and build within urban existing boundaries	Compact city
Edge expansion: allow connected growth on any boundary	Planned extensions
Linear or corridor expansion: allow growth connected or not only along transport corridors	Planned extensions and satellite towns
Exurbs: built new suburbs dependent on the exiting city	Satellite towns
New settlement: built new self-supporting independent settlements	Satellite towns
Free market: allow development to without controls over location and form	Dispersal

Sprawl is a possibility across all these strategic approaches, except intensification; and it is actually built into the free market policy. Urban sprawl can be said to occur where residential densities are not high enough to support a good range of local amenities and services, leading to the creation of environments where travelling by car is necessary for daily living, with a detrimental impact on walkability in the public realm and on equity. Urban sprawl now occurs at the periphery of most urban centres. It results in increased consumption of energy, resources, transport and land, raising levels of greenhouse gas emissions and air and noise pollution (EEA 2009a).

12.4.2 Strategic Planning Processes

Three strategic planning processes need to be manipulated to set the stage for health and healthy place-making at the local level.

Urban planning: Healthy Urban Planning sees the integration of health considerations into urban planning processes, programmes and projects. This involves establishing the necessary capacity and political and institutional commitment to achieve this goal. City-wide plans such as for housing, employment, retail or education need to be scrutinised. Health impact assessment can be a useful tool, but it is important that its methodology aligns with iterative and creative planning and design processes (Barton and Grant 2008; Grant and Barton 2013).

Transport planning: This needs to be viewed as movement planning not traffic planning. People need to move between home and other locations to access work, shops, education and leisure. Health is facilitated by building everyday physical activity into people lives—relevant to their ability. Planning for walking (often overlooked) and public transport needs careful attention. Access needs to be promoted, facilitating everyone, including the very young and people with limited mobility, to reach their required destination without having to use a car. The emergence of car-free and restricted car developments points to one way forward for health and sustainable development (Nieuwenhuijsen and Khreis 2016).

Green and blue infrastructure planning: Green infrastructure needs planning at the strategic scale and detailed design at the local level. The research into the relationship between green infrastructure and human health is well advanced (WHO 2017b). Well-planned strategic green and blue infrastructure can have multiple benefits for health, providing populations with access to nature and amenity; providing opportunities for urban farming, food growing and silviculture, and providing active long-distance transport routes and microclimate amelioration. This is in addition to a number of ecosystem service functions that support planetary health such as support for biodiversity through provision of species migration corridors and habitat reserves.

12.4.3 Climate Change

Spatial planning at the strategic scale has a major role to play in enabling cities to cope with extreme weather events. This includes the proper planning of the water cycle, including rain water capture, grey water reuse, flood risk management and sustainable urban drainage. There is an extensive literature on risks of climate change for health (WHO 2014). Urban planning needs to address building and transport energy use, two sources of climate emissions. In Europe, urban populations account for 69% of all energy use (EEA 2009b). Transport accounts for 21% of the climate gas emissions levels determined by both mode of travel used and spatial land use distribution (EC 2008). Two responses to climate change have been established, mitigation and adaptation. Mitigation is technological change and substitution to reduce resource inputs and emissions. Adaptation refers to measures to reduce the vulnerability of natural and human systems to climate change effects (Verbruggen 2007). With both responses, co-benefits should be sought which also increase the likelihood of healthier urban lifestyles.

12.5 Place-Making: Creating Human Habitat

Places are the everyday and intimate living environments that promote or detract from population health. What we have called strategic planning sets the scene for local environments. However design and planning decisions at the local level and how local people are involved (or not) create places. The idea of place exists at several scales, from individual rooms and apartments to neighbourhoods. When thinking of place in the context of health, we include physical characteristics: local buildings, streets and what people view as their own neighbourhood. However, the concept of place also has social dimensions: the relationships, support networks, social contacts and other aspects of a community. Urban design can support, detract from or even destroy this social dimension. Place must be seen as human habitat whose diverse characteristics combine to create, or undermine, health and

well-being. The characteristics of a place have a bearing on behaviour and lifestyle choices open to individuals who live there. Importantly, what constitutes a healthy place can vary for different groups within society. The elderly, young, disadvantaged and infirm, for example, all have particular requirements of a place if it is to support their health and well-being.

Although individual studies often lack the methodology to show causality (a consistent methodological problem when researching real urban situations), there is a wealth of guidance providing design characteristics that support population health in a local environment (see, e.g. Barton et al. 2010). There is also a growing experience amongst practitioners about the kinds of processes that are successful in creating healthier places. People matter, and perceptions of neighbourhood are strongly associated with health and well-being (Croucher et al. 2007).

There are two distinct ways that cities can tackle place-making. First, through neighbourhood-based projects, these usually focus on specific locations. Projects may improve existing neighbourhoods or lay the foundations for new neighbourhoods. Two projects from the WHO Healthy Cities will illustrate this. Firstly, an urban design project in Kirikkale, Turkey, to transform a successful local street market whose growth has compounded local problems of high traffic volumes and air pollution (Grant 2015). Secondly, in Helsingborg, where the focus was a residential problem in four apartment blocks with high levels of vandalism; this was linked to a lack of local pride, lack of natural surveillance and no sense of community. Following a pilot study, an urban design-led gardening project saw rich health outcomes for physical activity, well-being and social capital (Grant and Lease 2014). Secondly, some projects at this scale are not based on a specific location but cover a specific type of local place found repeatedly across a city, such as the 'Healthy Streets' programme in London (TfL 2017) or the greening of transport corridors in Barcelona (Ajuntament de Barcelona 2013).

12.5.1 Neighbourhood Projects as Place-Based Health Promotion

Neighbourhood environment are places of particular importance; at this scale evidence consistently indicates that there is an association between the built environment, health and well-being and levels of physical activity (Saelens et al. 2003; Croucher et al. 2007). Research has often focussed on the measurement of specific environmental attributes that may determine health, such as population density, land use diversity, street network design, accessibility to transit and greenery and aesthetics; but causality remains illusive in such studies (McCormack and Shiell 2011; Feng et al. 2010). Neighbourhoods that support walking are associated with higher levels of physical activity and lower levels of obesity. Accessible neighbourhood resources are strongly associated with levels of physical activity. Local green space

plays an important role in facilitating exercise and promoting health and well-being (WHO 2016).

One example of integrated neighbourhood work can be found in Gyor, Hungary, a WHO Europe designated Healthy City. Here, a physical regeneration programme combined with social interventions aimed to reduce health inequalities in a multicultural neighbourhood of the city, where many of the social and health problems were associated with a run-down urban environment. They began with assessments of physical interventions, which included renovations of the physical fabric, creating public areas for leisure, sport and play and general greening. To complement these physical improvements, the city introduced several social interventions with the main aims of community building and health and lifestyle improvements. These were delivered through programmes focusing on young people, children, families, mothers-to-be, mothers with young children and the Roma community (Grant and Lease 2014).

12.5.2 Involving Communities in Neighbourhoods for Health

The aspiration should be to engage local communities and stakeholders in designing and managing places, settings and communities consistent with the needs of users throughout the life course. And the good news is that 'communities get it!'. In Bristol and elsewhere, the HealthMap (Fig. 12.1) has been used as a 'health lens' through which local communities could understand their locality in terms of what is keeping them healthy and what is undermining their health. This approach can enable people's lived experiences to feed into neighbourhood planning processes, such as community health impact assessments of a regeneration plan (Hewitt and Grant 2010). In Belfast, UK, school children have participated, through a range of innovative range of engagement methods, in voicing their needs for an inclusive, resilient and child-friendly city. This approach has been particularly effective in bringing the poor quality of their walking routes to school to the attention of local politicians (BHC 2016).

The Scottish National Health Service has developed a tool to support healthier place-making (Scottish Government 2015). Called the 'Place Standard', the tool provides a method for communities and other stakeholders to come together to assess their local environments against 14 parameters, each with a physical manifestation that is known to influence health. The tool helps to combine social, economic, physical, cultural and historical characteristics of a location. Sixty-five separate instances of Place Standard use were recorded between December 2015 and February 2017. An evaluation report indicated how useful it has been in raising awareness and developing conversations leading to action about health and place-making (Scottish Government 2017).

12.5.3 Recognising Co-benefits

Planning for health is an approach that is strengthened, in its execution and outcomes, if the potential for co-benefits is recognised. In theory and in practice, a single intervention can be supported by multiple stakeholders, from several budgets if it delivers benefits for several city objectives. A good example of this is a programme in the Indian state of Bihar aimed at reducing the gender gap in secondary school enrolment by providing girls who continued to secondary school with a bicycle to improve access to school. Analysis found that this was responsible for a 32% increase in girls' enrolment in secondary school and a corresponding reduction in gender gap by 40% (Muralidharan and Prakash 2017). The initiative also proved good value for money compared with other options. Framing this in terms of Sustainable Development Goals (SDGs), it supported gender equality (SDG5). But this is the kind of initiative that would also support targets for good health and well-being (SDG3), quality education (SDG4) and sustainable cities and communities (SDG11) amongst others.

A global study of premature mortality due to non-compliance with international directives for the urban environment gives another example of the potential for co-benefits. Its findings emphasised the need for the reduction of motorised traffic through the promotion of active and public transport and the provision of green infrastructure, both of which could also provide opportunities for physical activity and mitigation of air pollution, noise and heat (Mueller et al. 2017). A third example can be found in Cape Town, South Africa. A public-private partnership formed to launch a housing retrofit programme in a low-income neighbourhood of Khayelitsha Township. Housing units were upgraded with insulation, low-energy lighting and solar water heaters with consequent savings in carbon dioxide emission and energy cost for each household. These measures lowered the risk of tuberculosis by reducing dampness in dwellings and improved hygiene by encouraging washing with warm water. The associated reductions in air pollution also lowered the risk of pneumonia and other respiratory illnesses (WHO 2011a). Focussing on co-benefits allows a stronger coalition of stakeholders to come together and support these more complex interventions.

12.6 Setting the Scene for Effective Action

Planning for healthy cities creates the potential for new city level collaboration for urban health. This is now supported globally. The Shanghai Consensus for Healthy Cities 2016 (Mayors Forum 2016) identified priority action areas for cities to achieve SDG3 'ensure healthy lives and promote well-being for all at all ages' and SDG11 'make cities and human settlements inclusive, safe, resilient and sustainable'. The Quito Implementation Plan, stemming from Habitat III, the United Nations Conference on Housing and Sustainable Urban Development, provides a

platform for national action (WHO 2016). These lay the basis for national and city level action to put the wider determinants of health and health equity into city and transport planning.

12.6.1 City Leadership for Healthy People

In the quest for 'the creation of health', the causes of the wider determinants of health (and ill-health) have been the subject of continual dialogue (such as Hippocrates 1849; Hancock 1985; Dahlgren and Whitehead 2007; Burns 2014; de Leeuw and Simos 2017). The refrain often heard in the context of national policy and echoed in city leadership is that economic growth is the main determinant of health (Povall et al. 2007) and that economic growth as an objective in itself will promote human development and improve health as a matter of course. However it is not as simple as that. Economic development can bring with it widening inequalities that frustrate health objectives (Pickett and Wilkinson 2015) and even the way that economic development is measured is subject to challenge on the grounds of being insensitive or even blind to human and planetary well-being (Jackson and Senker 2011). Moreover, the association at national or city level between average wealth and health can often mask a deepening inequality. After a basic level of economic development, further improvements often skew benefit to those in higher socio-economic groups (CSDH 2008). As part of what looks like a circular argument, health may need to constantly reposition itself in relation to more dominant political objectives (Kickbusch 2012). For example, the European Union set an additional 2 years of healthy life expectancy as a key determinant of its economic growth policy through expecting a longevity dividend in return. This same type of reasoning was been applied when negotiating the Ministerial Declaration on NCDs at the United Nations in 2011, by calculating the significant loss to national economies that emerging powers will experience if they do not address the health challenges at hand (Kickbusch 2012).

With the drive for economic prowess in the minds of many city leaders, there also has been recent discussion of the commercial determinants of non-communicable disease (Kickbusch et al. 2016; Buse et al. 2017). In Bristol, the public health section of the local authority has published a number of working papers of the negative impact on health of job creation. Even though employment is a key determinant of health, we cannot say that job creation is always pro-health especially where the work is insecure, low paid and shift work or involves long commuting times. City leaders will need to carefully assess political and economic drivers locally in order to clarify, strengthen and position a healthy city or Healthy Urban Planning approach. However, with several competing drivers of city development, many conflicting with health goals, it can be an uphill struggle to attempt to use planning and urban design for such value-based activity without strong political support (Tsouros 2017).

In terms of action, city leaders will need to:

1. Prioritise city policies that create co-benefits between health and well-being and other social, economic and environmental goods.
2. Engage with public agencies, spatial planners, voluntary bodies, businesses and industry and all other actors whose activities influence the ability of places to support and create health.
3. Engage local communities in identifying the physical characteristics of place that most support the health and well-being.
4. Promote development that is supportive to groups of all ages and levels of ability.
5. Ensure sustainable use and access to natural resources and reduce vulnerabilities to climate risks for communities.

12.6.2 Coalitions for Healthy Planning

Policy makers and researchers need to join forces with city leaders and help them steer investments in physical change to better support health, together with their communities. Pivotal to this success is the contribution of spatial planning, through Healthy Urban Planning and healthy transport; it offers the opportunity to shape the form and function of cities and the neighbourhoods where people live:

- Through planning, development and design
- Across all sectors; city governance, urban management, community development, landscape, architecture, urban planning and transport
- By partnerships; in policy, in practice and in research
- For initial build, for regeneration and for retrofit
- At all scales; from building and street, home-patch and neighbourhood to district, city and city region

12.6.3 Changing the Game

Revisiting the analogy of a game. The ever-growing community of those interested in healthier cities now needs to take charge of how this game is being played. We need to find common cause between action on the ground in cities and the research into that action. So we should not forget that one goal of planning for healthy cities should be to obtain better knowledge of how to improve urban health through planning, urban design and transport. We need research methods that can support and critically analyse multidisciplinary groups, fully including the communities involved, as we all develop our understanding of neighbourhood characteristics that support health.

There are currently two significant areas where more knowledge is required:

- Firstly, the economic case still needs proving and articulating in a way that politicians will find meaningful. There is an implicit hunch that 'building-in' health to cities and their neighbourhoods makes long-term financial sense. Can we now develop the research to prove it?
- Secondly, in this multidisciplinary, multi-professional and multi-stakeholder domain, evidence is being 'created', and evidence is being 'consumed' across quite different traditions of validity and relevance. However, we have yet to develop a common language. Without this how can we identify the misconnections and outright gaps that still exist within our ever-growing landscape of evidence and interventions?

I would suggest the following key questions for practitioners, researchers and city leaders with their communities, to keep asking of their own local context:

- How can I develop and spread an understanding of health in relation to urban form?
- What urban components and determinants of health are locally most dominant?
- What urban planning solutions have been successful and how can we adapt and implement them more widely?

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