# The built environment and health:
an evidence review

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1. INTRODUCTION

It is increasingly recognised that place and space have an impact on human health and wellbeing and that individual actions to improve lifestyle or health status are likely to be influenced by the environmental and socioeconomic context in which they take place. The built environment, as described here, includes the physical structures engineered and designed by people, including the places in which people work, live, play and socialise[1]. Also important are the connections between these spaces, including the built infrastructure and a range of natural features. The built environment includes several material determinants of health, including housing, neighbourhood conditions and transport routes, all of which shape the social, economic and environmental conditions for which good health is dependent. Within urban areas, the imaginative integration of built and natural features can help to create environments which are unique and interesting enough for people to lead varied and healthy lives. The varying influences on health and wellbeing are depicted in Figure 1[2].

Figure 1: The determinants of health and wellbeing in our neighbourhoods.
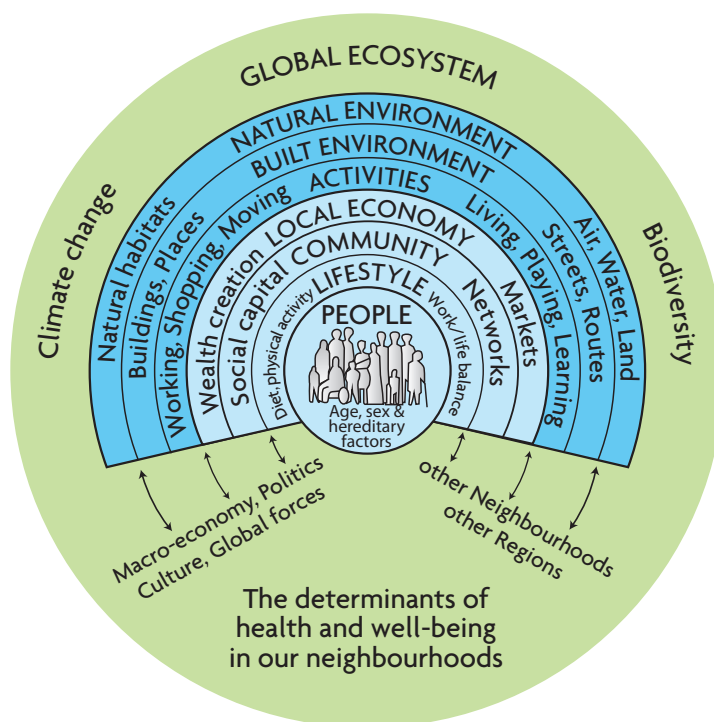
Source: Barton H, Grant M. A health map for the local human habitat. *Journal of the Royal Society for the Promotion of Public Health* 2006;126(6):252-261.

Although a wealth of guidance is available to support the provision of healthy urban planning and design practice, the evidence base underpinning these principles is still developing. The subjective nature of built environment features can make it difficult to make informed decisions on the appropriate design and planning of places, and successful practice in one community setting may not always be transferrable to another. However, the evidence base is growing, and there are several ways in which policies and actions which result in changes to an environment can have positive impacts across the population, as discussed throughout this paper.

This review summarises the main ways in which built environment features and neighbourhood characteristics can impact on health and wellbeing. By ensuring that people are able to experience the benefits of living in a well-designed, adequately resourced and well-connected neighbourhood, population level health benefits can be accrued. It is beyond the scope of this short paper to provide a comprehensive review of the evidence; instead recent literature that highlights the links between the built environment and health and wellbeing is summarised. The evidence on the direct impacts updates information from a previous 2008 report on Healthy Urban Planning provided to the Glasgow Health Commission[3]. The evidence on indirect influences is a synthesis of the results from a series of critical literature reviews commissioned by the GCPH and completed by the University of York. The most recent review was conducted in 2012 on the influence of land use mix, density and urban design on health[4]. Further evidence has been identified through the GCPH's experience of working with built environment professionals and communities to promote healthy practice since 2004. The content within this review is based on available literature from developed nations. Where possible, evidence from the UK, Scotland and Greater Glasgow has been prioritised over that which is more geographically distant.

The review is intended to offer guidance to those responsible for shaping decisions on the design, characteristics and maintenance of urban places from professions such as planning, regeneration, housing and health. It aims to clearly outline the relationship between the built environment and health to inform future practice in the creation of healthy and sustainable environments. The evidence is presented in terms of direct and indirect influences on health, with policy and practice responses offered for those which are direct. As indirect influences include a range of influences on health which can be experienced differently according to context and setting, generic forms of intervention cannot be uniformly implemented. As such, evidence here has been more appropriately summarised into key points. It is hoped that this review will increase recognition and understanding of the built environment as an important determinant of health by highlighting that appropriate decision-making can improve the quality of people's lives and prevent the escalation of healthcare costs in the future.

The built environment and health: an evidence review

2. DIRECT IMPACTS ON HEALTH AND WELLBEING

Direct impacts of the built environment on health and wellbeing include those traditionally associated with infrastructure planning and environmental health, such as air quality (indoor and outdoor), climate, water quantity and quality, noise and traffic-related injuries[5-8]. Much of the evidence concerning direct impacts is quantifiable and causal effects can be attributed.

2.1 Air quality

In a review of the evidence on housing and health for the Fourth Ministerial Conference on Environment and Health, the World Health Organization (WHO) identified five main indoor air substances that have harmful effects: radon, environmental tobacco smoke, cooking pollutants, volatile organic compounds and asbestos, all of which have been linked to respiratory diseases[9]. These substances can be controlled at the source, or mitigated against through filtration and ventilation[10].

Outdoor air quality in the UK is mainly affected by traffic, although in some areas industrial emissions are also significantly present[11]. Exposure to harmful pollutants can reduce life expectancy and heighten the ill effects of some respiratory conditions[12]. WHO has linked transport-related air pollution to numerous health impacts, including mortality, asthma, rhinitis, cardiovascular disease, cancer, adverse pregnancy and birth outcomes and decreased male fertility[13]. Significantly, poor air quality has been found to be associated with socioeconomic status, with people living in more deprived areas often at greater risk of harm[14].

Possible policy or practice responses

- Routine testing for asbestos and other harmful substances within homes, schools and other public buildings.
- Policies and legislation which prevents the harmful exposure of secondhand smoke in indoor and outdoor environments.
- Removing harmful indoor substances at the source and ensuring that buildings are well ventilated where risks have been identified.
- Policies which reduce levels of harmful transport and industrial emissions (e.g. through switching to cleaner energy sources, promoting active travel and providing a networked infrastructure which enables active travel throughout towns and cities).
- Policies which actively seek to reduce emissions in areas of high pollution, particularly in areas of deprivation to reduce inequalities.
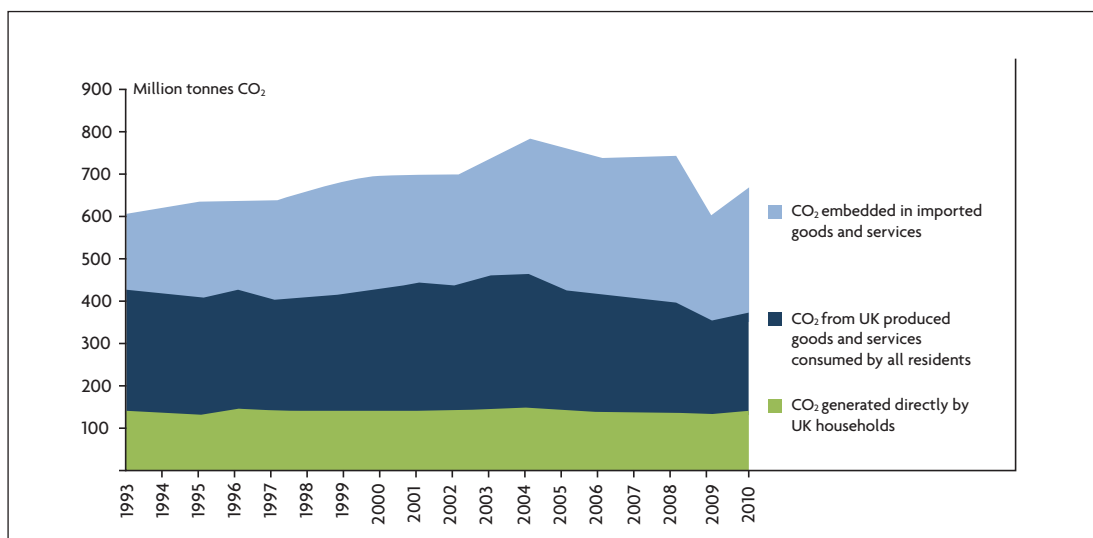
2.2 Climate

Climate change in Scotland is likely to be felt through direct impacts on the temperature, weather patterns and the environment. Figure 2[15] illustrates that carbon dioxide emissions have risen steadily since 1993, peaking in 2004 as a result of growth in levels produced by 'imported goods and services' and 'UK produced goods and services consumed by all residents'. To respond appropriately, levels of carbon consumption will need to be reduced, impacting on human behaviour in a variety of ways (e.g. changes to travel habits and food production)[16]. Globally, poor crop yields, the displacement of populations and the potential for resource conflict could significantly impact upon existing trade structures and the systems upon which cities are reliant[17,18].

The UK's contribution to global climate change through CO_2 emissions in 2010 was 722 million tonnes (excluding international aviation and shipping)[15]. As climatic conditions escalate, droughts, flooding, storms and temperature extremes are expected to increase in frequency[19-21]. Some predicted health impacts in the UK include an increase in heat-related mortality, food poisoning, increased exposure to UV radiation and rising injuries and deaths due to extreme weather events[15,22], thus placing additional pressure on NHS services. Infrastructure and buildings are being assessed to determine the extent to which they contribute towards climate change[23], as well as their ability to withstand the effects of extreme weather events. However, despite continuing progress, mitigative action is not currently taking place on the scale necessary to reverse current climate trends.

Possible policy or practice responses

- Mitigative climate change action such as transferring to active forms of travel, recycling, improving fuel efficiency, setting organisational carbon reduction plans and locally producing food.
- Accurate and accessible weather forecasting to enable people to prepare for threats, and efficient neighbourhood support systems to protect vulnerable members of society.
- Assessment of the design and situation of buildings in terms of their vulnerability to climate change.
- Having efficient, prepared and flexible emergency services to deal with disasters in a co-ordinated way.
- Providing information about how to mitigate against and adapt to climate change for individuals and organisations.

Figure 2: UK CO_2 emissions by source 1993-2010.

Source: Department for Environment and Rural Affairs (DEFRA). UK's Carbon Footprint 1993-2010. London; DEFRA: 2012.

The built environment and health: an evidence review

The built environment and health: an evidence review

2.3 Water

In Scotland, flooding represents the greatest climate change induced threat to health and wellbeing, heightening the risk of injury and infection and potentially resulting in a greater number of deaths[24]. As illustrated in Figure 3[25], the coupling of climate change and population growth in the future will increase the proportion of the population at risk from pluvial (rain related) flooding. Urban development contributes towards increasing this risk as a result of continued development on floodplains and the increased use of impervious materials which increase surface water runoff. As runoff increases, so too does the risk of flooding and contamination from microbial and chemical agents. Exposure to contaminated floodwater increases the risk of respiratory illness, gastrointestinal illness and high blood pressure, and many of the chemical contaminants found in flood water are carcinogenic[25,26]. The adverse effects of flooding are also likely to be felt through the increased prevalence of mental health symptoms in flooding victims[27], including depression, post-traumatic stress disorder and anxiety[28]. Vulnerable groups are more likely to be affected, and may have fewer resources to deal with the aftermath[29,30].

Possible policy or practice response

- Upgrading flood defence mechanisms where necessary, particularly in areas where people have fewer resources to cope in the aftermath of a flooding event.
- Increasing the number of permeable surfaces within built-up urban areas to reduce levels of surface water runoff.
- Offering immediate and long-term support to enable people to return to pre-event conditions in the aftermath of a flooding event.
- The provision of adequate materials to defend against floods in places at high risk.
- Timely weather forecasting and efficient emergency responses, including the identification of community facilities for people to access support in times of need.

Figure 3: Change in urban population at potential risk from pluvial flooding by source of change.
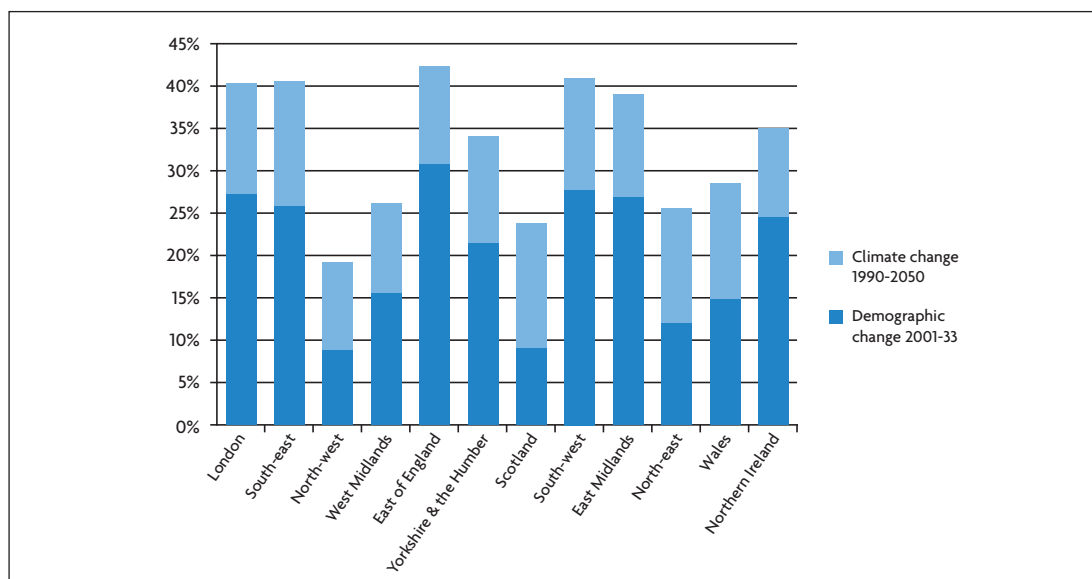
Source: Houston D, Werritty A, Bassett D, Geddes A, Hoolachan A, McMillan M. Pluvial (rain – related) flooding in urban areas: the invisible hazard. York: Joseph Rowntree Foundation; 2011.

2.4 Noise

Noise-related problems in Scotland are more prevalent in areas of socioeconomic disadvantage[31]. Excessive and persistent noise may cause sleep disturbance and annoyance, potentially leading to poor mental health[32]. Higher residential density, although providing opportunities for greater interaction between neighbours, may increase stress and conflict and can result in social withdrawal[33]. Homes that are sound-insulated reduce this risk. At the neighbourhood scale, places that are quiet and peaceful can improve the mental wellbeing of the resident population[34].

Possible policy or practice responses

- Accessible advice on how to insulate poorly soundproofed homes.
- Traffic measures which reduce speeds or divert traffic away from busy streets and spread the flow more evenly across built-up areas.
- The availability of guidance from local authorities and housing providers on how to report noise complaints.

2.5 Traffic

In 2010, 186 people were killed, 1,873 were seriously injured and 10,704 were slightly injured in road traffic accidents in Scotland[35]. As illustrated by Figure 4[35], road traffic deaths in Scotland have fallen steadily since the early 1970s. However, health inequalities continue to persist through disproportionately high levels of traffic accidents occurring in areas of socioeconomic disadvantage[36]. Despite a reduction in the number of road traffic accidents in the UK, child pedestrian injuries remain the leading cause of death in children aged five to 14[37], and the majority of accidents occur in built-up places where low speed limits are in place[38]. One successful measure has been the introduction of 20 miles per hour (mph) zones in parts of London, which has resulted in a 50% reduction in road accidents over a ten-year period[39].

Possible policy or practice responses

- Traffic calming measures in busy residential streets such as 20mph zones.
- Continued anti-speeding and road safety campaigns.
- Measures which reduce the risk of traffic accidents on busy roads within areas of socioeconomic disadvantage.

Figure 4: Scottish road deaths from 1950 to 2012.
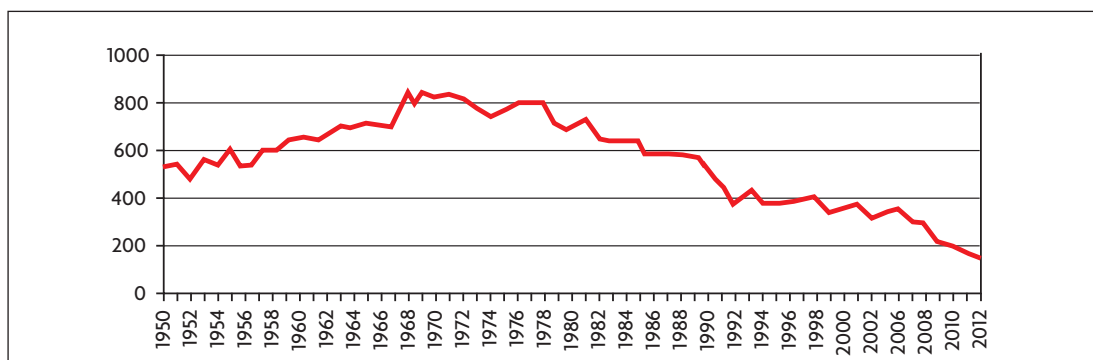
Source: National Statistics. Statistical Series Transport Scotland. Key reported road casualties Scotland 2011. Edinburgh: Transport Scotland; 2012.

The built environment and health: an evidence review

3. INDIRECT IMPACTS ON HEALTH AND WELLBEING

Indirect impacts on health and wellbeing include the ways in which built environment features and their design can influence the feelings and behaviour of individuals and populations. For example, perceptions of the local area, social connections, accessibility and physical activity levels are all influenced by the quality and design of the built environment. These impacts are recognised as being largely interdependent and have been associated with both physical and mental health outcomes[5,7,9,40-46]. It is important to note that much of the evidence base is cross-sectional, and causal attributions cannot be made. For example, although negative perceptions of neighbourhoods are associated with poor mental health, it may be that those experiencing poor mental health are more likely to perceive their local area negatively.

3.1 Housing and buildings

On average, people spend around 90% of their time indoors, with a high proportion of this within the home[14]. Several housing factors are associated with mental and physical health impacts such as air quality, dampness, infestation, noise, lighting, housing tenure and design[47]. For children, dampness and poor air quality have been associated with heightened asthmatic symptoms[48]. Accidents are another key health risk for children and remain a major cause of death. Household design or overcrowding[49] may be a contributory factor in some cases, illustrating that although accidents cannot be eradicated completely, their incidence can be reduced.

For good health, people require well-designed homes that are insulated, dry, warm[50] and spacious enough to meet home owner/tenant needs[51]. Similar factors to those relevant within the home can be attributed to other buildings where people have regular and prolonged contact (e.g. schools, hospitals and workplaces), although conditions within these places may be required to meet minimum standards. Although some attention has been accorded to the impact of hospitals[52-54] and care settings[55] on mental wellbeing and recovery, evidence on the impact of the workplace on health and wellbeing remains sparse[56].

3.2 Neighbourhoods

There is a considerable amount of literature focusing on the relative impact of neighbourhood characteristics on health, wellbeing and social cohesion[57-60], with a strong evidence base associating concentrations of disadvantage and neighbourhood problems with worse general health and poorer mental wellbeing[61-64]. Examples include a range of factors shaped by community behaviour (see Table 1)[31] and broader physical constraints such as poor quality greenspace, limited access to community facilities[58] and the presence of vacant or derelict land[65]. Within Scotland, Glasgow has the highest proportion of derelict land of any local authority (see Figure 5)[66]. This is significant, as people who perceive their neighbourhoods to be hostile, dirty, poorly maintained and lacking in safe places to play are more likely to experience lower levels of mental wellbeing[63,67], and the negative impacts may be felt to a greater extent by women, older people and those who are unemployed[68-72]. At an individual level, the built environment has been found to affect beliefs, behaviours and cultural influences; each impacting upon health[73,74].

Neighbourhoods with high levels of antisocial behaviour can increase social isolation and community fears[75]. Feeling unsafe within a neighbourhood is associated with a series of negative health outcomes and can prevent people (particularly women in low-income neighbourhoods) from using the built and natural environment to undertake exercise[76,77]. A range of measures that enhance people's perceptions of safety, therefore, may encourage greater levels of walking and cycling as well as improving mental wellbeing[33,78,79]. Physical characteristics of neighbourhoods identified as having a positive impact on health, wellbeing, physical activity and walkability are: choice and diversity; well-kept environments; affordable and efficient public transport; safe and sociable play areas; the presence of greenspace; well-lit and pedestrian-friendly footpaths; and street patterns that provide opportunities for informal contact among residents[46,68,80-83].

Key messages

- Housing design and condition can impact upon physical and mental health in a number of different ways.
- The workplace and other buildings/environments where people spend a large proportion of their time can also impact on mental wellbeing and health behaviours, although research in this area remains sparse.
- Poor quality built environments are associated with lower levels of mental wellbeing, particularly for women, the elderly and people that are unemployed.
- Noisy neighbours, poor quality greenspace, overcrowding and limited access to facilities are associated with poor mental health outcomes.
- Feeling unsafe in a neighbourhood is influenced by environmental conditions. This can result in reduced mental wellbeing and changes to health-related behaviour such as exercising.
- Vacant and derelict land – which is associated with a number of poor health outcomes – is more concentrated in areas of socioeconomic disadvantage.
- Health promoting neighbourhood conditions include; choice and diversity; well-kept environments; affordable and efficient public transport; safe and sociable play areas; high quality greenspace; well-lit and pedestrian-friendly footpaths and socially enhancing street patterns.

Table 1. Perception of prevalence of neighbourhood problems by Scottish Index of Multiple Deprivation.

Percentages, 2012 data

| | Adults | ← 10% most deprived | | | | | | 10% least deprived → | | | | Scotland |
		1	2	3	4	5	6	7	8	9	10	
General antisocial behaviour	Vandalism/graffiti/property damage	29	19	17	12	11	7	5	5	6	4	11
	Groups or individual harassing others	21	16	14	8	8	4	3	3	3	3	8
	Drug misuse or dealing	37	26	21	13	11	7	5	5	2	2	13
	Rowdy behaviour	32	26	21	14	14	9	9	9	6	7	15
Neighbour problems	Noisy neighbours/loud parties	25	20	17	11	12	7	8	5	6	5	12
	Neighbour disputes	15	12	9	6	5	5	4	4	2	2	6
Rubbish and fouling	Rubbish or litter lying around	47	40	37	33	31	25	22	23	17	16	29
	Animal nuisance such as noise or dog fouling	45	40	38	33	29	22	25	23	23	20	30
Vehicles	Abandoned or burnt-out vehicles	4	2	1	1	1	0	0	1	0	0	1
	Base	960	920	970	1,110	1,070	1,080	1,090	1,030	960	910	9,890

Source: Adapted from Scottish Government. Scotland's people. *Annual Report: results from 2012 Scottish Household Survey*. Edinburgh: Scottish Government; 2013.

The built environment and health: an evidence review

Figure 5: Local authorities with the highest amount of derelict land as a percentage of local authority administrative area, 2012.
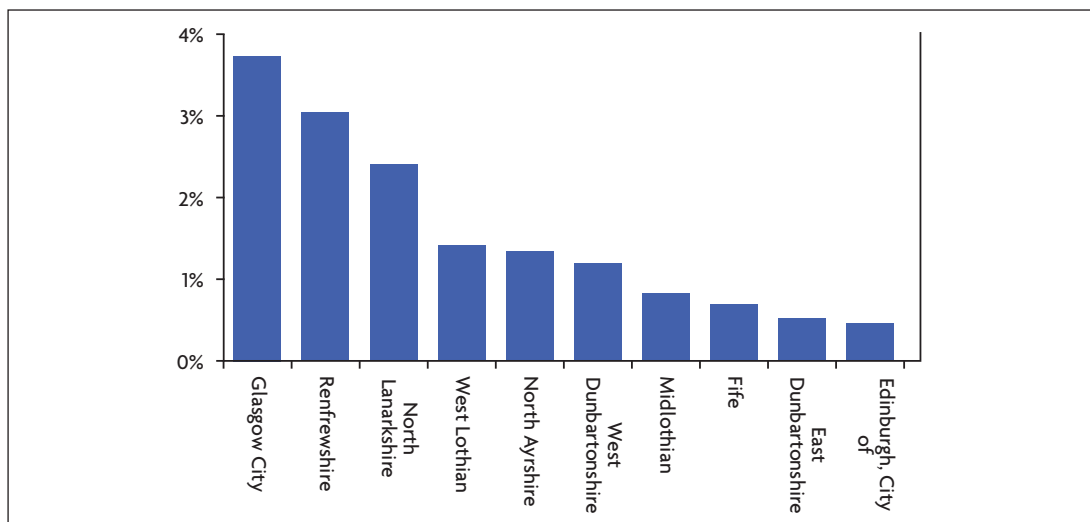
Source: Scottish Government. Scottish vacant and derelict land survey 2012. Edinburgh: Scottish Government; 2013.

3.3 Social environments

Fewer and weaker social networks have been associated with a number of adverse health outcomes including cardiovascular disease, mental health problems and higher rates of mortality[2,83,84]. Social fragmentation and the loss of social cohesion have been identified as being detrimental to mental and physical health[85-90]. There is also evidence that urban sprawl increases the social stratification of communities, which can negatively affect levels of trust and undermine social capital[91]. The dislocation between work, home and amenities can be detrimental to health and wellbeing, and social capital can diminish with increasing time spent in cars[74]. This is important because people living in neighbourhoods with high levels of social capital are more likely to express positive self-reported health[92].

Neighbourhood design that is likely to promote social networks is generally diverse and pedestrian-oriented, including public spaces such as parks to enable opportunities for socialising[4,93-95]. Relatively modest physical changes within a neighbourhood have been found to improve mental health and the sense of community between residents in close proximity to an intervention[96], although the specific pathways between neighbourhood features and improved health remain relatively unexplored[97]. Meanwhile, well-maintained areas have been found to be associated with increased social capital and feelings of safety[98].

Key messages

- Having a strong, supportive social network is important for maintaining mental wellbeing, and built environment features can facilitate or reduce opportunities for social activity.

- The density of the built environment can impact upon levels of trust and social capital, and lower density forms of development can stratify communities into distinct social class groups.

- Excess car use and the absence of local amenities can diminish the role of communities in enabling social activity to take place.

- Well maintained, distinctive, attractive and safe-feeling public spaces and routes enable social activity and can encourage people to prioritise community-oriented behaviour over individualism.

3.4 Connectivity, density and land use mix

The built environment is a key location for physical activity to take place[99], with attractive well-designed and connected public spaces and streetscapes increasing levels of active travel[100-102]. Taking regular physical activity can improve mental health and reduce the risk of obesity, coronary heart disease, type II diabetes and certain cancers[2,103-108]. The availability and accessibility of parks, recreation and sports facilities strongly influence physical activity levels, and areas of socioeconomic disadvantage often suffer due to the poor quality or unequal distribution of such resources[68,109].

The transport choices that people make are influenced by the distance that they have to travel to conduct daily routines and the way in which they perceive the physical environment[8]. Land use decisions, therefore, can encourage people to make sustainable travel choices by improving the quality of the built environment and the connections between places. 'Walkable' neighbourhoods are generally characterised by high population density, different types of land use, high connectivity (e.g. easy routes between destinations), good pedestrian and cycling facilities (well-maintained pavements, cycle routes, traffic calming measures), good accessibility (easily-reached destinations or facilities, greenspace, and transport links) and high levels of physical activity[76,110-116]. In urban areas, walking and cycling can be incorporated into daily routines to replace unnecessary short distance car journeys[117,118]. Scottish Planning Policy (SPP) promotes development in locations with existing walking or cycling networks, encouraging the creation of new networks in locations where they do not currently exist[119]. To benefit public health, proposed developments can be assessed to evaluate their impact on walking and cycling, as well as other aspects of health, such as road safety[120].

Key messages

- Well-connected and attractive public places and streets can encourage more people to exercise and make active travel choices.

- High-quality parks and recreational facilities are often unevenly distributed across towns and cities.

- Places which enable people to carry out daily routines (e.g. shopping, banking, exercising, meeting people) within walking distance of their homes are likely to have higher levels of walking and cycling.

- Land use decisions can be considered in terms of their contribution towards the promotion of health and the mitigation of poor health.

The built environment and health: an evidence review

3.5 Accessibility, amenities and decision-making processes

Higher density neighbourhoods allow better access to, and increased use of local facilities[93]. Having access to services and resources has been associated with positive health outcomes, although socioeconomic disadvantage does not necessarily correlate with fewer facilities and amenities[112,121]. However, services may range in quality between places, and some will be health-enhancing (e.g. food shops and supermarkets, exercise facilities, cultural amenities, financial services, shops and health care facilities) while others may be associated with health-damaging behaviours (bars, fast food outlets and off-licences)[68,122].

Evidence suggests that the increased presence of fast food outlets is associated with higher levels of obesity[123], and there is evidence in Scotland that areas of socioeconomic disadvantage contain a higher concentration of fast food outlets[40]. Living in urban areas of disadvantage or doing shift work has been found to be associated with lower fruit and vegetable consumption, and increased takeaway consumption[124]. Meanwhile, close proximity to a supermarket increases the likelihood of fruit and vegetable consumption and reduces the likelihood of being overweight or obese[125].

Neighbourhood perceptions have been found to be associated with feelings of control over the decision-making process, and feeling disempowered can be associated with increased feelings of dissatisfaction towards a neighbourhood[126]. Conversely, shaping decision-making can be associated with positive outcomes, such as increased feelings of neighbourhood pride and a greater willingness to participate in subsequent forms of engagement[127]. As illustrated in Table 2[31] the proportion of people in Scotland who feel able to influence decision making in their local area has been consistently low since 2007. In recent times there has been a growing recognition that public services do not always adequately engage with local people[128-130]. Managing expectations, ensuring local input into neighborhood decision-making and delivering on agreed changes, therefore, can be important for maintaining public trust and participation[131].

Key messages

- Large disparities exist throughout Scotland in terms of the presence of facilities and amenities.
- Some neighbourhoods are well-serviced with amenities and facilities, but have high concentrations of those which are health damaging.
- Fast food outlets tend to be more concentrated in areas of socioeconomic deprivation, which contributes towards the disparity in levels of obesity across the population.
- Having an input into the decision-making process within a neighbourhood may increase feelings of pride in the local area and encourage participation in subsequent forms of engagement.

Table 2. Percentage of people who agree with the statement 'I can influence decisions affecting my local area'.

Percentages, 2007-2012 data

Adults	2007	2008	2009	2010	2011	2012
Can influence decisions	19.6	21.7	21.8	21.3	22.4	21.5
Base	10,230	9,250	9,710	9,020	9,660	9,890

Source: Adapted from Scottish Government. Scotland's people. *Annual Report: results from 2012 Scottish Household Survey*. Edinburgh: Scottish Government; 2013.

3.6 Greenspace

'Greenspace' within urban areas includes parks, private gardens and other areas of vegetation which offer space for recreational activity. The importance of greenspace for mental wellbeing and quality of life is well-established; being an important resource for social activity, escaping the stress of urban living and connecting with nature[132,133]. The presence of greenspace can improve neighbourhood perceptions[113], enhance feelings of safety and potentially reduce rates of violent crime, as indicated by a recent study from the USA[134].

Proximity to an adequate quantity of high-quality greenspace has been found to have a protective effect on health[135], with its availability in areas of socioeconomic deprivation potentially reducing health inequalities[136] and increasing levels of physical activity[137-139]. Recent studies on the health-promoting effects of urban greenspace have identified the need to provide opportunities for sports, unstructured activities (e.g. trees for children to climb) and passive pursuits (e.g. places to connect with nature and enjoy the view) to take place[140,141]. Greenspace needs to be flexible enough to cater for different age groups and the varying needs of the population. As with other facets of the built environment, the use and enjoyment of greenspace is dependent on it being safe and attractive[115,142,143].

Key messages

- Greenspace is a valuable resource within neighbourhoods which can help to remediate the stresses of urban life and enable social activity to take place.
- Good quality greenspace can be unevenly distributed in urban areas, often benefiting people living in affluent parts of a city.
- The provision of good quality greenspace in areas of socioeconomic deprivation may contribute towards a reduction in health inequalities and result in increased levels of physical activity.
- The design, location and maintenance of greenspace is important for people to use it.
- Spaces should be flexible enough to cater for different age groups and the varying needs of the local and visitor population.

The built environment and health: an evidence review

4. WHAT MIGHT THIS EVIDENCE MEAN FOR FUTURE PRACTICE?

4.1 Creating healthy places: a complex challenge

It is widely accepted that the urban landscape can have a profound impact on health and wellbeing, with personal characteristics such as age and gender influencing the way in which people experience and respond to their environment. Improvements can have lasting impacts across the population by shaping people's daily actions, behaviours, perceptions and feelings in a variety of ways, influencing both physical and mental health. As already outlined, the pathways between built environment features and health can be direct or indirect. With direct impacts it is often easier to identify which population groups are at risk, enabling appropriate responses to be implemented. However, some direct impacts can be difficult to predict (e.g. the effects of climate change), and are therefore not possible to mitigate against completely. For other direct impacts, such as air pollution, it is possible to determine the direction of causality, although reducing its incidence remains difficult due to a range of structural factors which prevent changes from being implemented. With indirect impacts, the direction of influence can be less clear, and environmental features/conditions are likely to be experienced differently across population groups.

Many of the features of neighbourhoods which can enhance wellbeing are well-understood and improvements may be applied generically with positive results (e.g. adequate lighting, providing amenities and improving the quality of greenspace). However, places with healthy populations are not the result of formulaic approaches to their development. Communities have varying needs and aspirations, and these are important to consider when planning for their future.

4.2 Addressing inequalities in health through environmental improvements

The built environment is an important contributory factor to the persistence of inequalities in health throughout the UK. This review has highlighted several important ways in which environmental burdens are distributed unfairly across the population. Remedial actions such as regeneration activity, local housing association contributions, implementing healthy planning and design principles and improving public engagement will remain important ways of reducing inequality, although a more focused effort to promote environmental justice may be a more appropriate approach to address a challenge of such scale. While there are now many positive examples of healthy neighbourhood approaches, widely implementing policies and practice based on their potential to reduce inequality would represent further progress. To illustrate the potential to reduce inequalities through environmental improvements, poor quality built environment features that are more likely to be experienced in areas of socioeconomic disadvantage are outlined in Table 3 overleaf.

Table 3: Features of the built environment/neighbourhood issues that are more likely to be experienced in areas of socioeconomic disadvantage.

Built environment feature	Potential health and wellbeing risk
High levels of traffic	Increased risk of injury or death. Factors associated with mental wellbeing such as stress, anxiety and depression. Lower levels of walking and other forms of active travel.
Vacant and derelict land	Reduced social capital and feelings of safety within community. Poor mental wellbeing and reduced incidence of exercise in outdoor spaces.
Poor quality housing	Poor mental wellbeing and increased likelihood of health damaging behaviours (e.g. smoking, alcohol consumption, inactivity).
Lack of quality greenspace/public spaces	Lower mental wellbeing, increased stress, inactivity and less social activity.
Poor quality streetscape, shops and employment opportunities	Lower mental wellbeing, reduction in levels of walking and cycling, reduced social activity and higher unemployment or in work poverty.
Limited access to travel (including infrastructure for active travel)	Low levels of walking and cycling, isolated and poorly connected communities, loss of social activity.
Limited availability of amenities/facilities	Loss of social activity, increased rates of crime, loss of community identity.
Amenities/facilities which promote unhealthy behaviour (e.g. betting shops, fast food outlets)	Increased likelihood of making unhealthy choices such as poor diet and alcohol consumption, increased risk of financial hardship.
Antisocial behaviour and problems with neighbours	Reduced feelings of safety and increased stress related mental health problems (e.g. anxiety and depression). Reduced levels of social activity, particularly from vulnerable population groups.

The built environment and health: an evidence review

4.3 Evidence and local storytelling as complementary decision-making tools

There remains a need for the generation of data (and better use of existing data) on how spaces are used and how well resourced neighbourhoods are. The Scottish Index of Multiple Deprivation (SIMD) and Scottish Neighbourhood Statistics provide information on several aspects of the built environment and are useful for drawing comparisons between places. GIS mapping, asset mapping and local surveys can be used to generate further evidence and provide a comprehensive picture of a community's strengths and needs. The increased availability of such information may help to shape decision-making and prioritise investment. However, it is only part of the process. Harnessing local knowledge and skills increases the likelihood of creating environments which retain local identity and support existing businesses. From our experience, engaging with local people does not need to begin with a grand vision; a good starting point might simply involve a conversation about what aspirations people have for a neighbourhood, how they use their public spaces, and how these spaces could become more widely used. From there, relationships are built and possibilities can be explored. Engagement can take many forms, but that which sets out to be inclusive, uncomplicated and transparent will lay the foundations for positive relationships to develop.

4.4 Taking a long-term perspective

Although much is known about the way in which the built environment can affect health and wellbeing, continued research will be vital to keep pace with the various technological, social, economic, demographic and environmental changes that will shape the way in which places are planned and designed. Climate change, urbanisation, economic uncertainty, population ageing, changing communication modes and technological advancement are all significant factors that are becoming increasingly relevant to modern living and the policies and actions which influence urban areas. As such, the development of urban spaces will need to be considered in relation to both immediate needs and longer term projections. As the future cannot be predicted with any degree of certainty, places should be flexible and resilient enough to adapt in the face of change.

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The built environment and health: an evidence review

The built environment and health: an evidence review

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