Public Health England

UCL Institute of Health Equity

Local action on health inequalities:

Improving access to green spaces

Health Equity Evidence Review 8: September 2014

About Public Health England

Public Health England's mission is to protect and improve the nation's health and to address inequalities through working with national and local government, the NHS, industry and the voluntary and community sector. PHE is an operationally autonomous executive agency of the Department of Health.

About the UCL Institute of Health Equity

The UCL Institute of Health Equity (IHE) is led by Professor Sir Michael Marmot and seeks to increase health equity through action on the social determinants of health, in four specific areas: influencing global, national and local policies; advising on and learning from practice; building the evidence base; and capacity building. The Institute is building on previous work to tackle inequalities in health led by Professor Sir Michael Marmot and his team, including the Commission on Social Determinants of Health, Fair Society Healthy Lives ('The Marmot Review') and the Review of Social Determinants of Health and the Health Divide for the WHO European Region. www.instituteofhealthequity.org

About this evidence review

This evidence review was commissioned by PHE and researched, analysed and written by the IHE. It is intended primarily for directors of public health, public health teams and local authorities. This review and an accompanying summary briefing note are part of a series commissioned by PHE to describe and demonstrate effective, practical local action on a range of social determinants of health. Summary briefing notes are also available on the other series reviews.

This evidence review was written for IHE by Reuben Balfour and Jessica Allen.

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Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
www.gov.uk/phe
Twitter: @PHE_uk

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Key messages

1. There is significant and growing evidence on the physical and mental health benefits of green spaces. Research shows that access to green space is associated with better health outcomes and income-related inequality in health is less pronounced where people have access to green space.
2. Access to good quality green space is associated with a range of positive health outcomes including better self-rated health; lower body mass index scores, overweight and obesity levels; improved mental health and wellbeing and increased longevity in older people.
3. Access to green space is not equal across the population of England. People living in the most deprived areas are less likely to live in the greenest areas, and will therefore have less opportunity to gain the health benefits of green space compared with people living in the least deprived areas.
4. Increasing the use of good quality green space for all social groups is likely to improve health outcomes and reduce health inequalities. It can also bring other benefits such as greater community cohesion and less social isolation.
5. Local authorities play a vital role in protecting, maintaining and improving local green spaces and can create new areas of green space to improve access for all communities. Such efforts require joint work across different parts of the local authority and beyond, particularly public health, planning, transport, and parks and leisure.

Introduction

There is evidence that access to green space is associated with a range of better health outcomes and income-related inequality in health is less pronounced where people have access to green space.[1] However, access to green space is unequally distributed across England, contributing to health inequalities. The most affluent 20% of wards in England have five times the amount of green space than the most deprived 10% of wards.[2] Furthermore, people who live in the most deprived communities are ten times less likely to live in the greenest areas than people who live in the least deprived communities.[1]

The first part of this evidence review defines 'accessible' green space and provides an overview of the evidence linking access to green spaces with health benefits, setting out the potential for reducing health inequalities.

The second part provides an overview of interventions implemented at the local level to increase equitable access and use of good quality green spaces. Local authorities and local organisations have taken action on these issues through the implementation of interventions to:

- Create new areas of green space and improve the quality of existing green spaces
- Increase accessibility, engagement and use of green spaces

The final part of the review highlights gaps in the literature and recommends areas for further research.

This paper is part of a collection of evidence reviews commissioned by Public Health England (PHE) and written by the UCL Institute of Health Equity. A corresponding short briefing on this topic is also available.

Throughout the paper, we have highlighted certain evidence and resources in boxes such as this one. These are labelled in the following ways:

Intervention – an example of a strategy, programme or initiative, taken by a local area, organisation or national government, that it is felt may contribute to reducing health inequalities by acting on the social determinants of health. It has either been evaluated and shown to be effective, or is considered to be an example of promising action.

Key message(s) – summaries of the key findings or action proposed in this paper.

Key literature – summaries of academic studies or other reports which provide key information relevant to the chapter, often taking into account a range of different programmes or projects.

1. What is green space?

There is a wide variety of types of open space in England. They include areas of greenery such as local parks, public gardens and playing fields, but also 'spaces' such as streets where there are trees planted, and cycle ways. 'Accessible' green space is considered to be that which is located close to residents' homes, easy to walk to, physically accessible, safe to use, and provides well-maintained facilities.

Types of green space

A broad range of open space may be of public value and included in green space assessments of need and provision, as the box below illustrates. Definitions of green space vary and overlap: the terms 'public spaces', 'urban spaces', 'open spaces' and 'green spaces' are often used interchangeably within the literature.

Key Literature: Planning for a Natural and Healthy Environment[3]

The Department for Communities and Local Government published a consultation paper in 2010 on planning policy and shaping healthy environments. Within the paper, the government defined a wide range of green spaces.

Types of green spaces

- parks and gardens – including urban parks, country parks and formal gardens
- natural and semi-natural urban green spaces – including woodlands, urban forestry, grasslands, common land, wetlands, areas of open and running water, wastelands, derelict open land and rock areas
- green corridors – including canal and river banks, cycle ways and rights of way
- outdoors sports facilities (with natural or artificial surfaces, either publicly or privately owned) – including tennis courts, bowling greens, sport pitches, athletics tracks, playing fields and other outdoor spoors areas
- amenity green space – including informal recreation spaces, green space in and around housing, domestic gardens and town or village greens
- provision for children and teenagers – including play areas, adventure playgrounds, skate parks, basketball courts and other informal areas
- allotments, community gardens, city (urban) farms and land used for permaculture
- cemeteries and churchyards
- accessible countryside in urban fringe areas
- civic spaces, including civic and market squares
- landscape around buildings – including street trees

This document does not address the issues surrounding 'blue space', which is defined as publicly accessible bodies of water such as rivers, lakes or canals. However, many of the issues with green and blue space overlap, and there is evidence that blue space has positive impacts on health.[4]

What is accessible green space?

Proximity to plentiful, good quality green space has an important influence on the health of local populations[1, 5-7] and accessible, good quality green space is linked to better and more frequent use of green spaces.[8-10] As outlined below, organisations have developed specific benchmarks and standards defining accessible green space and other spaces used for play and recreation.

Key literature:

Bristol's Parks and Green Space Strategy[11]

In 2008 Bristol City Council developed an accessible green space standard, known as the distance standard, which sits alongside both quality and quantity standards. The aim of the distance standard is to safeguard and encourage an accessible network of green spaces. The standard is based on local research which identified the distance Bristol residents felt they could reasonably walk to access green space which coincided with the layout of Bristol's green spaces to ensure the standards were credible.

The distances proposed include:

- distance to the nearest green space – 400m/nine minutes' walk
- children's play space – 450m/10 minutes' walk
- formal green space – 600m/15 minutes' walk
- informal green space – 550m/13 minutes' walk
- natural green space – 700m/18 minutes' walk

Accessible Natural Greenspace Standard (ANGSt)[12]

Natural England has developed an Accessible Natural Greenspace Standard (ANGSt) which provides local authorities with a detailed guide as to what constitutes accessible green space. The Accessible Natural Greenspace Standard not only recommends the distance people should live from certain types of green spaces but also recommends the size of the green spaces in conjunction with distance to homes.

All people should have accessible natural green space:

- of at least two hectares in size, no more than 300m (five minutes' walk) from home
- at least one accessible 20 hectare site within 2km of home
- one accessible 100 hectare site within 5km of home
- one accessible 500 hectare site within 10km of home

ANGSt also recommends a minimum of one hectare of statutory local nature reserves per thousand people.

Accessible sport and play[13]

The Fields in Trust organisation has developed a benchmark for accessible outdoor sport and play. This states that:

- playing pitches should be available within 1.2km of all dwellings in major residential areas
- athletics tracks equipped with floodlighting should be within 30 minutes' drive (45 minutes in rural areas) of local residents (per 250,000)
- community tennis courts should be located within 20 minutes' travel time (walking in urban areas, by car in rural areas)
- bowling greens should be located within 20 minutes' travel time (walking in urban areas, by car in rural areas)
- local areas for play and informal recreation should be within 100m walking distance
- local equipped areas of play and informal recreation should be within 400m walking distance
- neighbourhood equipped areas for play and informal recreation should be within 1km walking distance
- size of playing space:
  - designated equipped playing space (0.25 hectares per thousand people)
  - informal playing space (0.55 hectares per thousand people)
  - children's playing space (0.80 hectares per thousand people)

Green space and local government

A position statement published by the Landscape Institute in 2013 states that local planning, design and landscape management must be developed with health as a key focus.[14] The new responsibilities placed on local authority public health teams provides an opportunity and incentive for public health to work closely with planners and landscape architects to develop and implement measures that facilitate access to green space and healthy places.

The Public Health Outcomes Framework (PHOF) includes an indicator on the use of outdoor space for health or exercise reasons, which provides an important incentive for local authorities to ensure good quality, accessible open spaces in local areas.

Key Literature: National Planning Practice Guidance – health and wellbeing[15]

National Planning Practice Guidance, published in 2014, includes a statement defining exactly what a healthy community is:

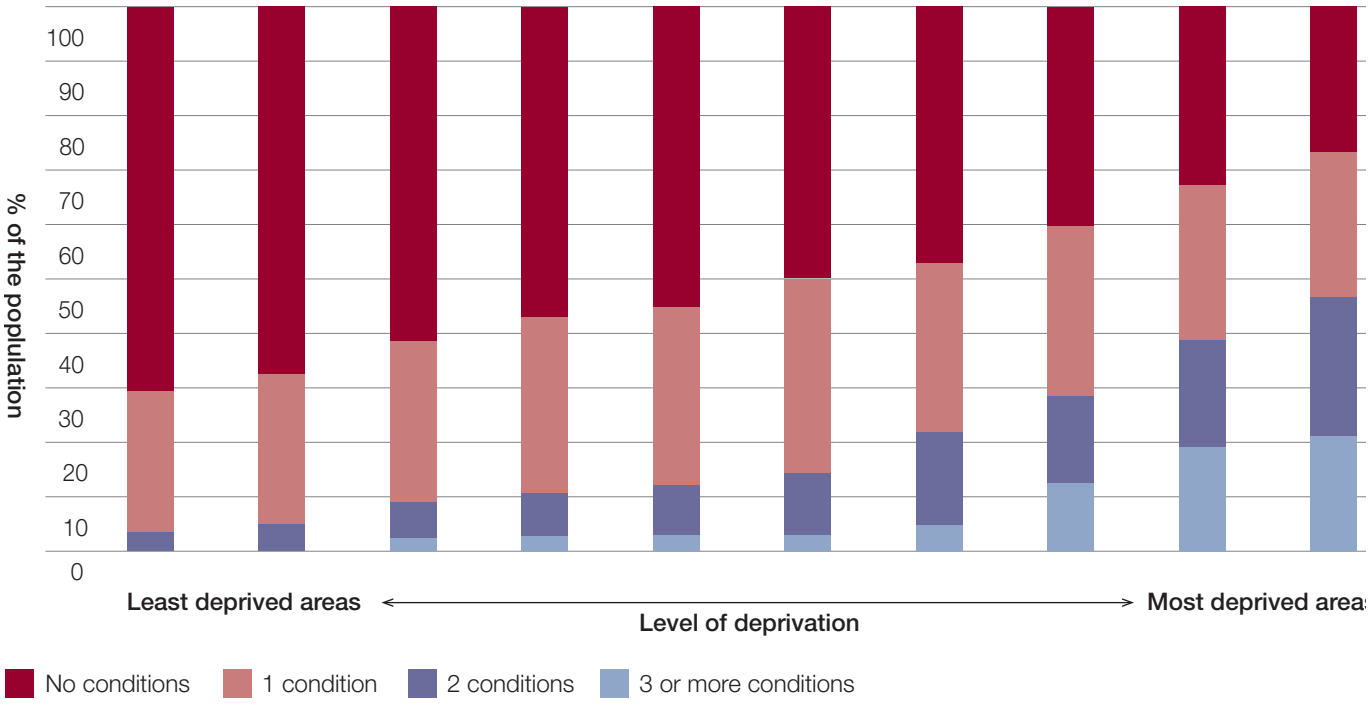
"A healthy community is a good place to grow up and grow old in. It is one which supports healthy behaviours and supports reductions in health inequalities. It should enhance the physical and mental health of the community and, where appropriate, encourage:

- "active healthy lifestyles that are made easy through the pattern of development, good urban design, good access to local services and facilities; green open space and safe places for active play and food growing, and is accessible by walking and cycling and public transport.
- "the creation of healthy living environments for people of all ages which supports social interaction. It meets the needs of children and young people to grow and develop, as well as being adaptable to the needs of an increasingly elderly population and those with dementia and other sensory or mobility impairments."

This provides encouragement for public health teams and planning departments within local government to work together in developing healthier communities.

2. Green space and health inequalities

Residents of more deprived neighbourhoods tend to experience less favourable living and environmental conditions than people who live in more affluent areas; there is a graded relationship in environmental conditions related to levels of area deprivation (16) illustrated in figure 1, although green space is just one of the factors considered in the graph.



Environmental conditions: river water quality, air quality, green space, habitat favourable to bio-diversity, flood risk, litter, detritus, housing conditions, road accidents, regulated sites (e.g. landfill)

Figure 1. Populations living in areas with, in relative terms, the least favourable environmental conditions, 2001–6
Source: (16)

People exposed to poor quality environments are more likely to experience poorer health outcomes than people who enjoy good quality environments.[5, 67] Cumulative small effects on a range of established risk factors could have important health benefits. For example, risk of adverse cardiovascular events might be increased by physical inactivity, by particulate air pollution, by social isolation and by heat-waves; each of these risk factors might be mitigated by improving accessible green space.

Proximity to green space influences health outcomes.[1] This is illustrated in figure 2, which shows an income-related gradient in all cause and circulatory disease mortality. The graph shows lower rates and inequality in mortality across all groups with greater exposure to green space, and higher rates of mortality across all groups with less exposure to green space.

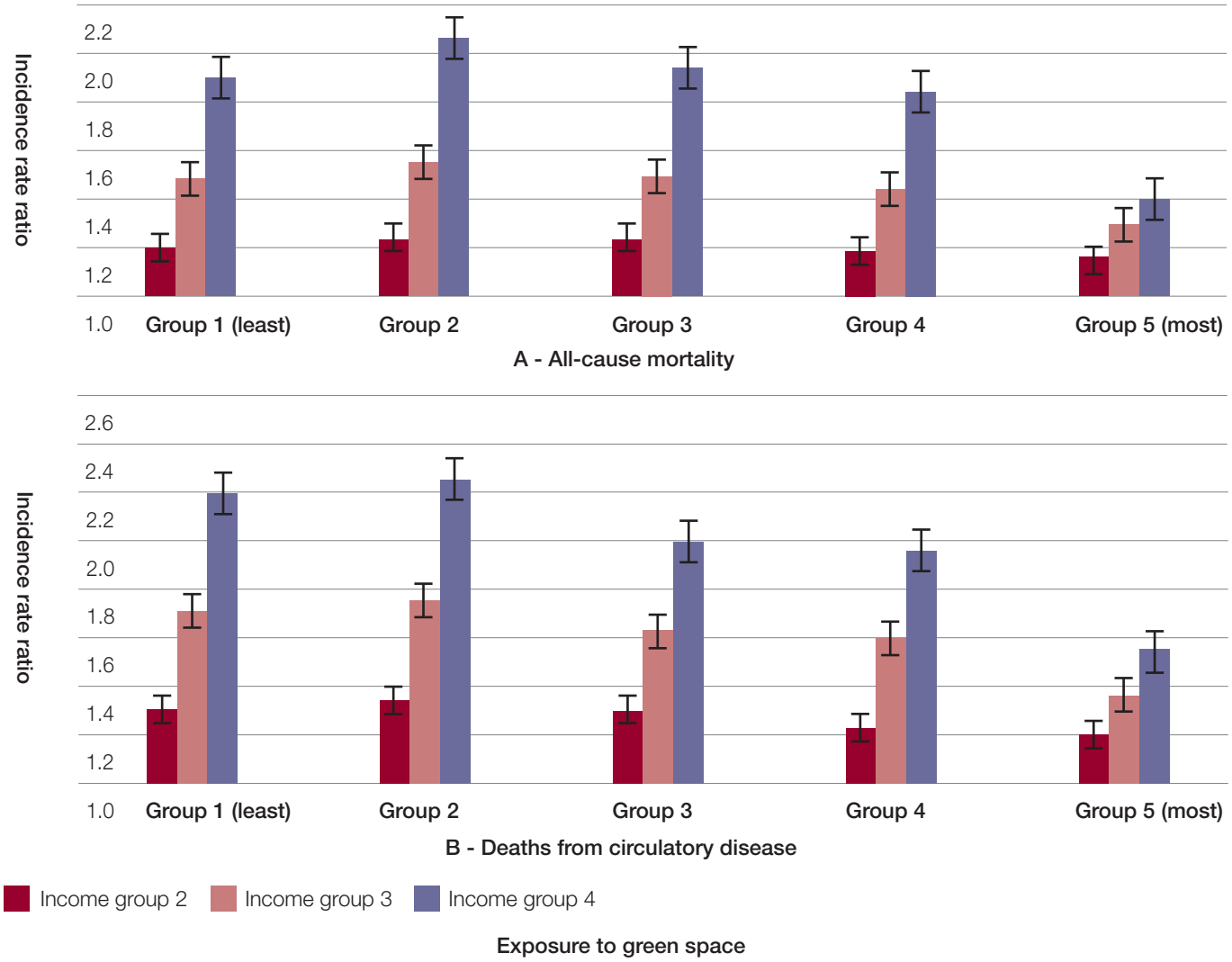


Figure 2. Incidence ratios for all-cause mortality (A) and deaths from circulatory disease (B) in income-deprivation quartiles 2-4, relative to income deprivation quartile 1 (least deprived), stratified by exposure to green space

Note: bars are grouped according to population exposure to green space. Error bars indicate 95% CIs.
Source: (1)

More generally, open space provides a platform for community activities, social interaction, physical activity and recreation, as well as reducing social isolation, improving community cohesion and positively affecting the wider determinants of health.[17, 18] For example, there is evidence of an association between social capital – such as volunteering, community trust and local safety – and health, including protective factors against dementia[19] and cognitive decline[20] in over-65s linked to social participation and community empowerment.[21]

Furthermore, while not solely about access to green spaces, a study investigating the relationship between older people's health and perceived neighbourhood environment, social contact, social support and self-efficacy, found that neighbourhoods with good quality facilities were associated with positive self-rated health and physical functioning. In contrast, poor neighbourhood perceptions were associated with poorer self-rated health.[22] The study suggests that there are a number of potentially positive health implications that can come from good local services and infrastructure which enable people to have a sense of control over their lives and remain socially active.

Evidence on the health benefits associated with use of green spaces is wide-ranging including positive associations with general health, health benefits associated with higher levels of physical activity, improved mental health and wellbeing as well as positive physiological effects of better quality environments. There can, however, be a conflict between maintaining accessible green space and tackling other local development priorities such as housing shortfall.

General health

Living close to areas of green space is associated with a range of health benefits. A study examining morbidity data derived from medical records found lower rates of disease among people living in environments with more green space within a kilometre radius of the home. The relationship was strongest for anxiety disorder and depression as well as for children and people with low socioeconomic status.[6] Similarly, a large-scale study investigating the rate of type 2 diabetes in middle-to-old-aged people found that, after controlling for demographic factors, cultural factors and neighbourhood circumstances, the risk of developing type 2 diabetes decreased consistently in greener areas; the risk was significantly lower in areas with 40% or more green space land use.[23]

A cross-sectional analysis of health survey data, controlling for individual-level socioeconomic deprivation, sex, age and smoking behaviour, found that the greenest areas had the lowest risks of poor mental health. In addition, the study found that with every 15% or more of green space availability, the risk of cardiovascular disease went down in all local areas; however, the researchers were not able to identify a dose-response relationship[i].[24]

Having good access to green space has also been associated with living longer. A study in Japan examined the links between areas of urban green public space and the longevity of 3,133 older local residents (born in 1903, 1908, 1913 and 1918) over a five-year period. It found two environmental factors increased their likelihood of survival: having green space within a walkable distance from home; and having a positive attitude towards the local community. These two factors increased the longevity of life of participants independently of other factors including age, sex, marital status and socioeconomic group.[25]

[i] Dose-response relationship refers to the measurement of change in effect (response) on an organism caused by differing quantities of exposure (dose) to a particular stressor.

Physical activity and associated health benefits

Green space is linked to greater levels of physical activity and associated health benefits. A study examining obesity levels across a number of European countries found that people living in areas with large amounts of green space were three times as likely to be physically active than people living in areas where there is little green space.[26] Similarly, a study designed to test the association between green space and changes in the body mass index (BMI) of predominantly economically disadvantaged children found that, after controlling for ethnicity, gender, age and socioeconomic status, children living in areas with more green space had lower BMI scores than children living in areas with less green space. Higher levels of green space were associated with lower BMI scores over a two-year period. This may be the result of increased physical activity and time spent outdoors.[27]

Elsewhere, a study in Bristol which examined the association between objectively measured access to green space, frequency of green space use, physical activity and the probability of being overweight or obese, found that, after controlling for socioeconomic status, area deprivation and other neighbourhood characteristics, people who lived further away from urban green spaces were less likely to visit them than those who lived nearby, less likely to meet the recommended guidelines for physical activity and more likely to be overweight or obese. People who frequently visited green space were more likely to be physically active and less likely to be overweight or obese.[28] It is estimated that the cost to the UK economy of people being overweight and obese is £15.8bn per year.[29]

As the evidence described above suggests, those living close to green spaces are more likely to engage in physical activity. Physical activity is associated with better health outcomes. For example, research has shown that exercise can reduce the likelihood of dying of coronary heart disease and can produce moderate improvements in quality of life for people living with the disease.[30] Other research has shown that engaging in physical exercise can improve the quality of life for cancer patients, reduce the chances of negative health outcomes, help with the recuperation process and improve the adverse psychological effects associated with cancer sufferers.[31]

In addition, as outlined earlier in this section, there are inequalities in access to green space across England: less deprived areas have more green spaces than more deprived areas. These inequalities are likely to contribute to inequalities in health. For example, a report by the National Children's Bureau found that children living in deprived areas are nine times less likely than those living in affluent areas to have access to green space and places to play. Boys living in deprived areas are three times more likely to be obese than boys growing up in affluent areas, while girls are twice as likely.[32]

Mental health and wellbeing

Access to green space is linked to better mental health and wellbeing. Analysis of panel data on the effects of living in green urban areas indicates, after controlling for socioeconomic factors, that on average people living in greener urban areas were happier than when they lived in areas with less urban greenery. General health questionnaire (GHQ) scores showed that people living in greener areas experienced significantly lower levels of mental distress, while life satisfaction scores showed significantly higher levels of wellbeing among people living in greener areas. Furthermore, living in a lower super output area (LSOA)[ii] with green space 1 standard deviation above the mean, equal to 81% green space, was associated with a 0.14 reduction in GHQ score and a 0.07 increase in life satisfaction.[33]

Similarly, a longitudinal study into the effects on mental health of moving to either greener or less green urban areas (based on the generalised land use database [GLUD]) found that moving to greener urban areas was associated with sustained improvements in mental health, while moving to a less green area was associated with a decline in mental health within the first year of moving, returning to baseline levels thereafter.[34]

Exercising in green spaces versus indoors is also associated with better mental health and wellbeing. A systematic review looking at the health benefits of outdoor exercise in natural environments found evidence suggesting that engaging in physical activity in such settings is associated with additional benefits to mental wellbeing that are not seen with similar levels of indoor physical activity.[35] Moreover, a review of physical activity interventions and their effects on the brain found that older people who engaged in walking as a physical activity were less likely to develop dementia, and MRI examinations showed greater volumes of grey matter among walkers.[36]

A healthier living environment

Green space helps contribute to a healthier living environment overall, which is likely to have a positive impact on health. Research indicates that green space can improve the environmental quality of an area with consequential health benefits: improved air and water quality, noise absorption, and reduced 'urban heat island' effects[iii] are some of the environmental benefits that green spaces can provide. Additionally, green spaces can improve absorption of excessive rainwater, as vegetation intercepts rainfall leading to more evapotranspiration, reducing surface run-off and thereby the likelihood of flooding and sewage overflow, while protecting biodiversity and enhancing ecosystems.[37]

[2] A LSOA has a population of 1,000 to 3,000 people, or between 400 and 1,200 households, as designated by the Office for National Statistics.
[3] An urban heat island is an urban area that is significantly warmer than surrounding rural areas, primarily because the land surface in towns and cities absorbs and stores heat, and because of more concentrated energy use.

3. Scale of the problem

Prevalence and costs of physical inactivity in England

As outlined in section 2, there are links between access to green space and levels of physical activity.

Estimates suggest that an inactive person is likely to spend 37% more time in hospital and visit the doctor 5.5% more often than an active person.[38] In 2007, physical inactivity was estimated to cost the NHS somewhere within the region of £1bn and £1.8bn.[39]

A study examining the physical inactivity of England's population by analysing data from the Active People Survey (APS) on over a million individuals, found high levels of physical inactivity across the study population: around 20% engaged in minimal levels of physical activity while around 10% stated that they had not engaged in five minutes of continuous walking in the past four weeks.

Furthermore, panel data from the study shows a gradient by household income in terms of physical inactivity. People with the lowest household income were found to be around 30% more likely not to engage in any physical activity whatsoever, whereas those with the highest level of income only had a 10% chance of being completely physically inactive. Panel data also showed inequalities in physical activity levels when measuring local area deprivation. The study found that around 15% of people living in the least deprived local areas did not engage in physical activity compared with over 20% of people living in the most deprived local areas.[40]

Unequal distribution of green space

Access and proximity to green space are unequally distributed across the population. The most affluent 20% of wards in England have five times the amount of green space compared with the most deprived 10% of wards.[2] Furthermore, people who live in the most deprived communities are ten times less likely to live in the greenest areas than people who live in the least deprived communities.[1]

The distribution of green space is also related to levels of urbanisation. Urban life can expose people to stressors including noise, pollution, crowding, fear of crime and limited access to good quality green spaces.[41] Research suggests that those most at risk of poor health are more likely to live in the most deprived environments, which can have a cumulative negative influence on stress levels, self-esteem, weight and physical activity.[16]

In terms of quantity, rural areas by their very nature tend to have more green space; however, research indicates that access to, and the quality of, green space in rural areas is often problematic as amenities such as lighting, safety, upkeep, suitability of paths and play equipment are often of a poor standard.[42] Therefore, it is important that green spaces in rural areas are well maintained and easily accessible to enable local residents to make the most of them.

Why some groups of people are less likely to access green space than others

Identifying why certain groups of people are less likely to visit green spaces is important; community engagement can help to establish this and provide insights and valuable perspectives on green space access and use. As has been highlighted throughout this paper, the distribution of good quality green space is unequal across England, affecting access, use and health outcomes.[1, 28]

An analysis of data collected through the Monitor of Engagement with the Natural Environment Survey (2013), which surveys around 45,000 people each year from across England, exploring the differences in access to nature, has identified several groups who are less likely to visit green spaces than the national average. These include some minority ethnic groups, urban deprived populations, more disadvantaged socioeconomic groups, people aged over 65 and disabled people.[43]

Developing a clear understanding of what motivates local residents to use green spaces is essential when developing areas of green space and improving access to existing areas of green space. Analysis of the Monitor of Engagement with the Natural Environment Survey (2013) identified a range of reasons for why people visit green space. These include: exercising dogs; personal health and exercise; relaxing and unwinding; and enjoying fresh air, pleasant weather and scenery.

Similarly, analysis of the survey data to establish the reasons for not visiting green space found a range of reported reasons, including being too busy at work; poor weather; being too busy at home; poor health and old age, as well as no particular reason.[44]

Data collected as part of an intervention that sought to increase green space engagement among hard to reach groups found people unwilling to use green spaces due to poor maintenance of green sites, inadequate facilities and fears for personal safety.[45]

Selling off and managing green space

Increasingly, local authorities are facing financial pressure to sell green space in order to generate income and save money. There is also often a pressure placed on local authorities to develop more land for housing or other facilities to accommodate projected population growth.[46] For example, from 2009 to 2012, London councils raised £69m from the sale of open public land; the largest portion was made up by the sale of playing fields.[47]

In some cases, local communities or organisations can take over and maintain open spaces in order to ensure that they are still available for use by the local population. Community land trusts (CLTs) are non-profit, community based organisations run by volunteers that develop local assets for local use, owned and controlled by the community.[48] Schemes such as this offer opportunities for the effective maintenance of green spaces.

It may be important to increase recognition of the health-promoting properties of green spaces in local planning applications, in particular for community infrastructure levy (CIL) or Section 106 funds (46). Public health teams and other staff within local authorities have a role to play in this process to explain how green spaces are a part of vital infrastructure.

4. What works to improve access to green space?

Section 3 identified the health benefits of green space along with barriers in accessing good quality green spaces. This section identifies interventions and solutions that have been found to be effective in increasing access to green space and engagement with the natural environment. The majority of this activity has taken place at the local and community level, aiming to engage local people in a range of activities, such as walking, cycling, running, children's play, sport, farming, horticulture and gardening, while developing and improving land designated as green space.

To reduce inequalities in health, it is important that interventions to improve access to green spaces are available to the whole population, but with a scale and intensity that is proportionate to local needs.

4.1: National programmes

Several national programmes have been implemented in regions across the country aimed at encouraging more engagement with the natural environment across the population as a whole, but also focussing on particular population groups who are less likely to use green spaces. Some of these are described below.

Natural England's Access to Nature programme

The Access to Nature programme is a grant programme made up of a consortium of 11 major environmental organisations, which aims to distribute around £30m of funding to improve access and engagement with the natural environment. It has a particular focus on people who may face social exclusion or who have little, if any, contact with the natural environment.[49]

An evaluation carried out in 2011 indicated that the programme looked set to outperform on the majority of its targets. The evaluation showed key outcomes to include an improvement in opportunities for active experience and enjoyment of natural environments for at least a million people, including groups experiencing social exclusion; successful investment in the quality of 100 natural spaces to better meet the needs of local people and wildlife; investment in access links and associated networks to 130 places by 2014; and, 250,000 people benefitting from physical improvements to local natural spaces.[50]

Walking for Health

Walking for Health is a UK-wide programme run by the Ramblers and Macmillan Cancer Support, which aims to increase physical activity through the uptake of regular short walks within local communities. Set up in 2000 by the Countryside Agency, the programme has been delivered at the local level by the NHS, local authorities and voluntary organisations.[51]

Evaluation of the project was carried out in 2009 to identify the economic benefits of the scheme and wider green space access. An illustrative cost–benefit analysis of the programme estimated that it would deliver 2,817 quality adjusted life years (QALYs)[iv] at a cost of £4,008.98 per QALY. Based on life-cost averted[v], it was estimated that this would make a saving to the NHS of around £81m.[52] There was no evaluation of the different QALY impact of the programme on different parts of the population and therefore it is not possible to summarise the potential impact on health inequalities.

Green Gyms

The Green Gyms scheme is run by the Conservation Volunteers, who specialise in reclaiming green spaces across the UK. The idea is to improve health and physical activity while doing something beneficial for the environment at the same time. Special guides assist and support participants in a range of projects that give people the opportunity to engage in physical, outdoor activities in local green spaces.[53]

A cost–benefit analysis of the effectiveness of the Green Gym project between 2005 and 2009 estimates that the scheme generated savings to health services of £1,359,453 (based on cost-averted savings) and indicates that for every £1 invested in Green Gyms, £2.55 will be saved in treating physical inactivity related illness. Furthermore, analysis of the cost-effectiveness over the same period estimates that the scheme delivered 132 QALYs at a cost of £4,031 per QALY based on participation in one Green Gym session per week.[54] As with the Walking for Health evaluation, however, there was no study on the distribution of impact across the population and therefore it is not possible to discuss potential equity impacts of the programme.

4.2: Improving access to green spaces at the local level

The evidence presented in earlier sections of this document highlighted the unequal distribution of green space across England and differences in health outcomes associated with this inequality. The creation of new green spaces, protecting existing green space and improving the quality of green space, are important factors in improving the accessibility and increasing the use of England's green spaces, particularly for deprived communities in areas where access is typically poorest.

Local authorities are well placed to understand local needs and deliver appropriate action to provide good quality, safe and accessible areas of green space that meet the needs of all of their population.

[iv] A measure of the state of health of a person or group in which the benefits, in terms of length of life, are adjusted to reflect the quality of life. One QALY is equal to one year of life in perfect health.

[v] The life-cost averted model is based on three health conditions for which the prevalence in the general population and the annual cost per person of treatment are known: cardio-vascular heart disease; stroke; and type 2 diabetes. The model assumes that Walking for Health participants are representative of the general population, and that they adhere to the programme of physical activity.

Intervention: the Healthy Active By Design (HABD) tool, Western Australia[55,56]

The HABD tool was introduced by the National Heart Foundation of Australia in 2004 to assist planners in developing environments that support active lifestyles. The tool was developed in response to local government requests for practical guidance in designing healthy communities in Western Australia. The National Heart Foundation of Australia works in collaboration with local and national agencies to deliver the work.

HABD provides a platform for sharing information, research and case studies that demonstrate the creation of environments that support healthy living, including the design and development of green open spaces. The tool is based on research indicating that users of open spaces are more likely to achieve the recommended physical activity levels required to be beneficial to health, compared with non-users.[57]

Creating new areas of green space and improving the quality of existing green spaces

As detailed in section 1, a number of organisations at both the local and national level have outlined accessibility specifications. While it is important to have green spaces in close proximity to local residents, the green spaces on offer also need to be well maintained and of good quality. Improving the quality and facilities available in areas of green spaces may help overcome some of the barriers associated with accessing and visiting green spaces. Several examples of interventions that have been commissioned locally to improve access and quality are shown in the boxes that follow.

Intervention: new natural recreation area, Bytheway, Dorset[58]

East Dorset District Council has created an area of green space for residents of a new 186 home development. The area is East Dorset's first suitable alternative natural greenspace (SANG),[vi] designed to offer a purpose-built outdoor recreation facility. The houses are being developed in close proximity to several areas of protected land and there are concerns among the existing local community about the impact of additional visitors to the protected areas, caused by potential new residents of the development.

This prompted developers to apply for planning permission to develop 14 hectares of green space which lie close to the protected areas. The plans include a new car park, footpaths, ponds, a boardwalk, benches and plants which will open up the green space for the local community and future residents of the development through volunteer opportunities. It is anticipated that this new area of green space will enable residents to engage in physical activities, such as jogging and recreational activities.

[vi] Suitable alternative natural greenspaces are areas that take recreational pressure off protected landscapes, making them a potentially useful way of supporting growth and development while protecting wildlife.

Intervention: Pocket Park programme, London[59]

The Pocket Park programme is run by the Greater London Authority and is part of the Mayor of London's Great Outdoors manifesto, launched in 2009. The programme aims to improve streets, squares, local parks, canal and riverside areas across the city. The initiative aims to deliver 100 new or improved areas of greenery within London's busy urban environment.

60 projects are already underway, ranging from community orchards to Green Gyms to 'edible bus stops' (areas of green space located around London's transport network made up of flowers and vegetable plants).

Intervention: Clissold Park restoration[60,61]

Clissold Park is located in the North East London Borough of Hackney. In 2011, £8.9m was invested in park restoration, to build and improve a wide range of facilities and features. The project, proposed by local councillors, is funded by the Heritage Lottery Fund's Urban Parks programme.

Aside from grassy areas and trees, the park offers a wide range of amenities, including:

- aviary and animal enclosures (including butterfly dome)
- children's play area
- a café and function room
- dog-free areas
- fountains
- multi-use games area
- organic food growing area
- pond-dipping platform
- paddling pool
- table tennis table
- refreshment kiosk
- river
- tennis courts
- toilets
- wheels park

Survey data published in 2014 recorded over three million visits between May 2013 and April 2014. This far exceeds the year's Heritage Fund target of two million visits. Clissold Park users group hopes to publish analysis in the near future demonstrating how visitors have been using the park.

Intervention: Dudley Healthy Towns project[62]

Dudley Healthy Towns project is investing £4.5m into encouraging families to make the most of the borough's outdoor areas.

The project has invested in improving five of the borough's parks and play areas, converting them into 'healthy hubs'. Each hub comes with a free outdoor gym and dedicated park ranger.

The project has also invested in creating active travel corridors, which make it easier and safer for people to walk and cycle across the borough.

Evaluation of the project found there were a number of measurable improvements, including:

- increased use of the healthy hubs
- increased visiting frequency and duration
- increased self-reported physical activity within the healthy hub users
- improvements in the overall condition of the healthy hubs and user satisfaction
- increased perceptions of safety

As with evaluations of the other initiatives above, there was no consideration of different levels of impact across the local population.

Increasing accessibility, engagement and use of green space

As described in section 3, it is also important to consider what motivates local residents to engage with green spaces and venture outdoors. Doing so may help overcome common barriers that prevent people from accessing and engaging with green space, as well as improving community cohesion and action.

Local community groups can play a part in increasing accessibility, engagement and use of green space and therefore increase local community assets. Action taken by local community groups includes creating play areas and taking part in cleaning up operations.[63, 64]

Intervention: Green Exercise programme[45]

The Green Exercise programme was designed to target people who were disconnected with green space and who did not take regular physical activity.

Interventions took place in eight different regions across the country. Through local partnerships, Natural England developed and implemented pilot projects to test the process of engaging hard to reach groups in green exercise activities. Within each region, interventions were tailored to local needs and attempted to engage with a range of different people, including:

- black and minority ethnic groups
- young people
- people with learning difficulties
- overweight and obese adults
- people suffering from mental health problems
- people with specific health conditions, such as heart conditions
- people living in deprived areas
- older people

Projects, some of which are ongoing, covered a range of different activities, including conservation tasks, outdoor activity programmes (including cycling), walking programmes and woodland games.

Evaluation of the programme found that local interventions had enabled a range of hard to reach groups to access local green spaces and participants reported positive experiences. Furthermore, the programme helped identify a variety of common barriers that prevented people from accessing green space. These included:

- anti-social behaviour, intimidation and fear for personal safety
- poor maintenance of green spaces
- lack of time
- lack of transport
- lack of knowledge about the location of green space
- lack of knowledge about what constituted green space
- lack of knowledge about the facilities on offer
- poor health
- lack of confidence in the outdoors
- poor weather

The programme was also found to provide a number of other benefits, including learning and development (such as improved social skills, confidence, work experience and knowledge about green spaces), increased levels of physical activity, self-reported improvements in wellbeing, community cohesion and community participation.

Intervention: Glasgow Health Walks[65,66]

Glasgow has some of the highest levels of health inequality in Europe and the lowest life expectancy in the UK. Glasgow Health Walks project was implemented to address these issues and improve physical activity levels and quality of life for the city's residents. Working with local organisations, the project aims to establish and support local health walks.

The project offers free, gentle and friendly walks of up to two miles, available to everyone. The walks are facilitated by trained coordinators who develop connections with organisations working directly with communities and help them to build support and community capacity to carry out the walks.

Paths for All commissioned an evaluation of the project, which produced some positive results. Between April 2011 and March 2012, Walk Glasgow delivered 33 open walk projects open to the general public, and 26 closed walk projects restricted to clients from certain groups such as hospital in-patients.

Participants reported a number of positive outcomes, including:

- feelings of improved fitness and physical health
- improved confidence
- increase in social contacts
- reduction in social isolation

The project was also evaluated for its social return on investment. During the year 2011-12 a total of £48,705.15 was invested into the Walk Glasgow project, which accounted for staff and volunteers', time, expenses and training. The evaluation recorded outputs from 21 Health Walk projects, each delivering an average of 35 walks over the year. The value of the outcomes is estimated at £384,630. This represents a cost–benefit ratio of £8 in benefits for every £1 invested.

Intervention: Active England – the woodland projects[67]

The Active England programme aimed to increase participation in sport and physical activity of local residents across England. As part of the programme, five three-year projects were developed in woodland areas of Kent, Devon, Derbyshire, Wiltshire and Nottinghamshire.

The projects targeted key groups who were defined as being under-represented in sporting activities. These were:

- women and girls
- disabled people
- people from black and minority ethnic backgrounds (BME)
- under-16s
- over-45s
- people on low incomes

The woodland area teams involved in the projects undertook a wide range of activities to improve access to green space and participation of targeted groups. These included:

- installing new infrastructure including paths, catering facilities, visitor centres, outdoor furniture, and climbing walls
- buying new equipment, including laser quest and archery equipment
- special events like fun runs, craft fairs, cycle events, activity days, and tree festivals
- staff-led activities such as health walks, cycle rides, and nature walks
- transport facilities, to and from sites

Evaluation of the programme found significant increases in the total number of visitors across three of the projects (other projects did not measure total numbers of visitors), between 2006-07 and 2007-08: from 391,340 to 686,905. Furthermore, projects also increased the number of BME visitors, people aged 16-44 and families, increased numbers of female visitors and increased participation in physical activities.

5. Areas for further research

Within the evidence linking green spaces with health improvements, there is no indication about the proximity to, amount and type of green space that produces specific health benefits. More research would be needed to establish links between access to green space and improved health outcomes more precisely.

The majority of evaluations do not consider the health equity impact across the social gradient for different social groups: they tend to simply record average numbers of users or focus on specific target groups. While targeting is a useful and important way of improving access to green space for certain groups of people, a focus on improving provision, quality and access for all is needed to reduce health inequalities. Universal support which is tailored to be proportionate to need will help to reduce the social gradient in access to good quality green spaces and improve access to green spaces for everyone.

Evaluation of interventions in this area often fall short of measuring impact over long periods of time and rely on survey data and self-reported measures of success. For stronger designs, studies should gather information on long-term outcomes of improved access to green space and include outcome measures that can be directly attributed to improvements in health. For example, interventions could monitor changes in the number of visits to see the GP, weight loss or levels of engagement in weekly recommended levels of physical activity.

In addition, there is a lack of evidence from evaluations that demonstrates the cost-effectiveness of access to green space interventions in improving health outcomes. The majority of interventions present a number of outputs, such as increased usage of green spaces, but rarely include data on whether or not increased usage of green space has resulted in improved health outcomes.

Finally, as described in section 1, there is now government planning guidance on what constitutes a healthy community. It is important that future planning and building developments monitor the impact of healthy planning developments on health outcomes.

Conclusion

The evidence outlined in this review indicates that access to and use of green space are associated with a range of positive health outcomes that can help reduce inequalities in health. These include improvements in mental health, length of life, circulatory health, lower BMI scores and greater physical activity levels. Access to good quality, safe and local green spaces can contribute to local and national measures to reduce health inequalities and promote healthy and active lifestyles.

The interventions covered in the review address a range of aspects relating to access to green space. These include interventions to increase the quantity and improve the quality of green spaces; increase accessibility of, and engagement with, green spaces; and, increase the use of green spaces. Efforts to improve access and regular use of green spaces require cross-sectoral collaborations and the involvement of local communities. Local authorities are well placed to protect, maintain and improve green spaces while understanding the needs within local areas. Public health teams in local areas have a clear role in prioritising, designing and commissioning interventions to improve access to green spaces and in working with local authorities to influence delivery. Interventions that improve access to green spaces are likely to help local areas reduce health inequalities and help level up the social gradient in health.

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