urban green space is defined as any vegetated land within, or adjoining an urban area

the extent of urban green space is difficult to estimate as it may include a wide variety of amenities (such as allotments, playgrounds, canal towpaths as well as parks). Public parks only represent about one third of all urban green space in the UK

there are inextricable links between human beings and the natural environment

urban green spaces impact positively on the health of local populations in many ways. They can:

- provide opportunities for physical activity, which contribute to the prevention of many health problems such as cardiovascular disease, diabetes, stroke, some cancers and osteoporosis
- improve mental health and well-being by enhancing concentration, worker productivity, and self esteem. They can alleviate anxiety and depression, and boost immunity
- promote healing and recovery after an accident or illness
- provide opportunities for education, social inclusion and cohesion by supplying space for social mixing, creating networks and relationships. Playing in parks and gardens helps children to develop intellectually and learn about social interaction
- help mitigate the impact of climate change by reducing flood risk, sequestering carbon dioxide in trees and plants and reducing atmospheric pollution. The urban tree canopy also helps to reduce the risks from ultraviolet radiation exposure and the heat island effect
INTRODUCTION

Urban green space can be defined as any vegetated land within or adjoining an urban area. Parks and gardens; allotments; amenity grassland; canal corridors; sports facilities; playing fields and playgrounds are all green spaces [1,2].

The total amount of urban green space in Britain is difficult to estimate as it may include a wide variety of features (such as allotments, playgrounds and parks). Public parks are estimated to cover an area of between 127,000 and 147,000 ha [3], and represent only about one third of all urban green space in the UK [4].

Urban green spaces provide economic, social, cultural, environmental and health benefits to their local populations, and encourage the development of sustainable communities [4,5,6].

The Victorians created urban parks to provide ‘green lungs’ that could be used to promote physical health and recreation, and to reduce stress, crime and social unrest in towns and cities [7,8].

The environment is important for health and the World Health Organization suggests that 24% of the global burden of disease is caused by environmental factors [9,10].

The Ottawa Charter for Health Promotion [11] stressed the inextricable links between people, their environment and health; and the protection and improvement of natural environments as an important goal to promote health [8].

HEALTH AND WELLBEING

Urban parks and other green open spaces provide opportunities for health promoting physical activity.

Over 95% of people in England think that it is very or fairly important to have green spaces near to where they live and 22% of the population of England visit a green space three or more times a week [13].

Physical inactivity is linked to obesity, one of the ten leading causes of death in developed countries. Around a fifth (21%) of men and a quarter (24%) of women in England are now obese; and almost 24 million adults are now overweight [14]. Overweight and obesity leads to an increased risk of chronic disease and lack of independence in the elderly [15].

The total economic cost of inactivity in England (including costs as a result of treating the related diseases and from days lost due to sickness) is approximately £8.2 billion per year. This figure does not include costs related directly to obesity, estimated to be another £2.5 billion annually, £0.5 billion of which is NHS costs [16,4].

Current advice from the Department of Health is for adults to do thirty minutes moderate exercise (e.g. brisk walking) five times a week, if possible outdoors [17]. The provision of attractive urban green spaces encourages this healthy activity.

Exercise in a natural green environment is generally preferred to indoor activity and is more effective in tackling health problems. Moderate exercise helps to prevent heart disease, diabetes, strokes, some cancers (including colon cancer), osteoporosis, depression, anxiety and sleep problems [18,19,20,21].

In general, urban green spaces are positively associated with lower all-cause mortality and lower deaths from circulatory disease [22].

Open green spaces improve mental health and wellbeing.

Depression related illnesses are expected to become the greatest cause of ill health by 2020. At present, depression is the most common mental illness in Europe [23]. In Great Britain, in 2000, one in six adults reported a neurotic disorder, the most prevalent being anxiety and depression [24].

THE BIOPHILIA EFFECT

The Biophilia hypothesis, originally proposed by Edward O. Wilson in 1984, suggests that human beings have an innate and very strong link with the natural world, and that close contact with the latter reduces human stress, anxiety and aggression [12].
In Britain, mental ill health costs the economy about £77 billion per year (including indirect costs). The NHS, in England spends around £3.8 billion annually to treat mental illness [4].

A natural green environment can provide effective relief from everyday stress, improve concentration, enhance worker productivity, improve self esteem, boost immunity, and promote healing and recovery after an accident or illness [25]. Natural vistas have been shown to decrease the recovery time for patients in hospital [26].

The existing research indicates that exercise is a useful adjunct in the treatment of schizophrenia [18, 25].

Urban green spaces provide opportunities for education, the development of social networks and promotion of wellbeing.

Green spaces provide great opportunities for social mixing, as well as enhancing social networks and relationships, all of which are associated with a lower risk of premature death and greater sense of well-being [25]. Attractive parks can help create a sense of pride in the community and build up self esteem in its individuals. Low self esteem on the other hand is linked to unhealthy activities such as smoking, alcohol and drug abuse [27].

Studies suggest that on average, people living close to a green environment perceive their health to be better [28].

Parks provide children with the opportunity to explore, play and use their imagination. Parks also enable children to learn more about social interaction, the natural world, different cultures and how to cope with risk [29, 30]. A number of studies have suggested that outdoor play helps children’s intellectual and social development [31, 32].

‘Green Infrastructures’ are networks of different open spaces linked together with greenways/attractive routes and are often referred to as a community asset.

In 2004, Dr William Bird explored the economic benefit of green space by estimating its ability to support physical activity within the community [16]. He estimated that in terms of avoided inactivity, the potential value of urban parks in a selection of large UK cities was between £1.6 million and £8.7 million per year. This is largely attributed to reduced costs from work absence and lower risk of early mortality, and includes respective savings of £0.3 million and £1.8 million to the NHS from reduced levels of ill health. For example, each year a park in Portsmouth could potentially save the economy £4.4 million, including £910,000 to the NHS. A 3 km footpath on the edge of Norwich could potentially save the economy £1 million, including £210,000 to the NHS. These estimations are based on an urban park providing 20% of total physical activity needs and a 3km footpath providing 16% of total physical activity needs and take into account their respective population densities [16].

Urban green spaces can also increase local property values, encourage development investment in the area, and attract tourism [25, 33].

Sustainability of the environment and health.

Urban green spaces are part of the ecosystem which provides the conditions to sustain healthy human life [34].

The most important positive ecological effects of urban green spaces are that they:

- **enhance biodiversity**, by providing accommodation for a wide range of plants and animals and form part of a network of habitats [6]. The World Health Organization recently reported that biodiversity is important for human health, mainly by helping to control the spread of diseases [34, 35, 36]
- **reduce flood risk** by retaining ground permeability, attenuating water flows and providing flood water storage [6, 36, 37]
- **store significant amounts of carbon** in the trees, plants and in soil organic matter, thereby...
contributing to the mitigation of climate change [34,36,38]. Climate change was estimated to be responsible for approximately 0.3% of mortality and 0.4% of the burden of disease, globally in 2000 and these figures are likely to increase [39].

- **reduce atmospheric pollution** in urban areas (e.g. by reducing the amount of dust and total suspended particles) and the burden of related disease [37,40]
- **reduce UV exposure** through the shade provided by the tree canopy. Trees also create urban microclimates by increasing local cooling of the urban environment, which helps to reduce the adverse effects of heat waves [6,37]
- **mitigate noise** by providing a barrier of vegetation [6,37]

**CONCLUSIONS**

The positive effects of open green spaces on human health are many and well documented in the scientific literature. To improve the health and wellbeing of local communities, decision makers, planners and developers are encouraged to consider this evidence.

The benefits of open green spaces can be summarised as follows [4,8,34]:

- **physical benefits**: urban green spaces provide attractive locations for a huge range of sporting and recreational activities, including walking, cycling, football and running, as well as more gentle activities such as picnicking or photography
- **mental benefits**: urban green spaces provide areas of quiet and solitude where people can escape from the stresses of life
- **spiritual benefits**: urban green spaces can help bring about a sense of place and provide areas for contemplation, reflection and inspiration
- **social benefits**: urban green spaces provide areas where social clubs and organisations can hold events. They can also help individuals enhance their own personal social network
- **environmental benefits**: urban green spaces help to preserve ecosystems and biodiversity, mitigate atmospheric pollution and reduce the urban heat island effect. They encourage carbon sequestration, provide some degree of defence against flooding and encourage human interaction with the natural environment.

**EXAMPLES OF HEALTH SCHEMES RELATED TO THE USE OF GREEN SPACE**

- **The National Cycling Strategy** was produced in 1996 by the National Cycling Strategy Board to set out comprehensive plans to significantly increase levels of cycling across the country. In 2005, the Department for Transport established Cycling England, which replaced the National Cycling Strategy Board. In March 2007, Cycling England launched **Bikeability**, a flagship scheme, already adopted by half of all the local authorities in England to encourage the safe use of bicycles.
  [http://www.dft.gov.uk/cyclingengland](http://www.dft.gov.uk/cyclingengland/)
- **The Green Gym** is based on the idea that outdoor exercise is more effective than using conventional indoor gyms. The scheme was first developed in the late 1990s by Dr William Bird, an Oxford GP, and was launched in 1997 as a pilot study. After being implemented by the British Trust for Conservation Volunteers (BTCV), it is now commonly found throughout the UK.
  [http://www2.btcv.org.uk/display/greengym](http://www2.btcv.org.uk/display/greengym)
- **Walking for Health** was initially set up with the name of **Walking the Way to Health** by the Countryside Agency, in collaboration with the British Heart Foundation. It is a healthy walking scheme, based on the same concept as the Green Gym. Presently, the scheme is managed by Natural England, which supports over 590 local health walk schemes.
Most of the evidence on green space and public health is based on statistical correlations; but there is a need for empirical research to demonstrate more clearly the health benefits of green open space.

Possible areas for further research are around:

- improving accessibility to open spaces for people with limited mobility and other disabilities
- exploring the synergistic effects of green spaces and social capital on public health
- examining the potential health benefits of unusual green spaces, such as green roofs and walls
- investigating the effects of ‘Green Infrastructures’ on the health and well-being of the whole community

REFERENCES

1. The Town and Country Planning Act 1990 (c. 8), London: HMSO
6. CABE Space. Start with the Park. Creating sustainable urban green spaces in areas of housing growth and renewal. London: Commission for Architecture & the Built Environment (CABE); 2005


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