



HM Partnerships
Innovators in Public Health

A Rapid Review of the Evidence Base in relation to Physical Activity and Green Space and Health

NHS Ashton Leigh and Wigan

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‘A mass shift in current activity levels is needed. This will only be achieved if people see and want the benefits but also if opportunities are created by changing the physical and cultural landscape – and building an environment that supports people in more active lifestyles’

(Chief Medical Officer 2004)

Green space has for many decades been linked to both social and health benefits for those that access it. This assumption is now supported by a growing body of robust research, which identifies that high quality green space brings considerable benefits to the local economy, to the environment and to people’s physical and mental health in particular in terms of reducing obesity, decreasing the risk of coronary heart disease and strokes and improvements in mental health and wellbeing. Research has shown that residents in high 'greenery' environments were 40% less likely to be overweight and obese as those in the lowest greenery category. The Faculty of Public Health, in their recent publication *Great Outdoors* (2010), note that ‘Safe, green spaces may be as effective as prescription drugs in treating some forms of mental illnesses’.

In terms of public health, green space is most commonly associated with physical activity and mental health and wellbeing. Current evidence suggests that individuals could derive health benefits by engaging in as little as 150 minutes of moderate exercise daily for adults and 1 hour a day for children and young people (DH 2011). However physical activity levels have declined over recent decades and reversing this decline could confer considerable population health benefits. The UK government set targets to increase levels of participation in physical activity and sport including measures for providing cleaner, safer and greener public spaces. (DCMS 2002) and the Marmot Review (2010) stressed the importance of creating more good quality open space where it is lacking to help tackle health inequalities.

Public parks account for one-third of all the public green space and 90% of peoples green space use. If an area has high quality parks, it is likely that more residents will use them more often; people are more satisfied with their neighbourhood and are more likely to report better health. However there are stark differences in the provision and accessibility of green space based on socio economic status and ethnicity. Provision of green space is worse in deprived areas than in affluent areas.

This review examines the evidence base relating to green space and health and green space and physical activity levels. The review finds that there are considerable inconsistencies and contradictions in the findings of research in these areas. However, on balance of the evidence considered within this review clearly indicates a positive association between access to high quality green space and health and access to high quality green space and physical activity.

The review concludes that:

- **Investment in parks and green spaces should be seen as an investment in public health**
 - Local authorities and Primary Care Trusts are in a good position to identify and improve communities that are poorly served by good quality green space and parks
 - The Joint Strategic Needs Assessment (JSNA) provides a significant opportunity for local authorities and current PCTs to work together in the planning of healthy urban spaces

- **A supportive built environment is important in encouraging activity across all age groups**
 - Recent work has shown that where people have good perceived and/or actual access to green space they are 24% more like to be physically active (Coombs et al). If this effect was universal and the population of England had equitable good access to green space, it is estimated that the life-cost averted saving to the health service is around £2.1 billion per annum

- **Green space needs to be available close to residential areas**
 - it should be ensured that there is a park or small supervised (overlooked) play area within 4 minutes walk of every family home

- **That the green space needs to be of sufficient quality**
 - That it should be multi purpose, have facilities for all age groups, be safe and included in wider strategies

- **Green space can help to reduce health inequalities.**
 - The more disadvantaged a community, the more likely they are to lack good quality open space
 - Black and minority ethnic groups and those socially disadvantaged have less access to high quality green space. Yet improving green space in urban areas has the potential to benefit those who have the most to gain

- **Several studies observed variations in green space use by different age groups**
 - access to open space can increase levels of exercise in a community, especially for children
 - male cardiovascular disease and respiratory disease mortality rates decreased with increasing green space but there is little evidence of similar impact for females
 - women can be discouraged from using green space because they view these areas as unsafe

A Rapid Review of the Evidence Base in relation to Physical Activity, Green Space and Health

1.0 Introduction

Green space sits within and contributes to the quality of the natural and built environment. Green space has for many decades been recognised for its social and health benefits and more recently the importance of the design of the built environment and its contribution to health has been recognised (HUDU, accessed 03/08/11).

Approximately 80 per cent of the UK population live in urban areas (defined as an area with a population over 10,000 people) and there is a growing evidence base demonstrating the relationship between the built environment and health (Rao et al 2007). The World Health Organisation (WHO) believes that urban planning is a significant determinant of health and recognises that attempts to change behaviour without changing social, economic and environmental conditions are likely to have little success (WHO 2003).

The most important green space in relation to public health benefit is in and around urban populations. Public parks account for one-third of all the public green space contained within the urban areas of England (National Heart Forum, 2007). In England, 8 out of 10 people live in urban areas and the networks of parks and green spaces help sustain the quality of everyday life (CABE, 2010c). According to CABE (2010a) the local park is the green space which matters most to people, irrespective of quality, accounting for 90% of the green spaces all people use. However, other types of urban green space include nature reserves, allotments, playing fields and recreation grounds. These provide important opportunities and space for physical activity including space for outdoor facilities, for example, play areas and outdoor gyms.

Historically there has been a decline in the quality of urban green space, however this trend has now been reversed and nine out of ten people are now using their parks and green spaces (CABE, 2010c) and importantly, they value them more: in 2007, 91% of people thought it was very or fairly important to have green spaces near to where they live, and by 2009 this had risen to 95 per cent (CABE, 2010c). Despite this, too many local green spaces still remain unused. There are also stark differences in the provision and accessibility of green space based on socio economic status and ethnicity (CABE, 2010a). Provision of green space is worse in deprived areas than in affluent areas. Accessibility to green space and parks is significantly poorer for areas with higher numbers of black and ethnic minority groups, whilst accessibility to recreation grounds and playgrounds appears to be more equitable (CABE, 2010c). A person's ethnicity has been found to be the strongest indicator of the way people use their local green space (CABE, 2010a).

This rapid review of literature relating to the impact of green space on health and physical activity was commissioned by NHS Ashton Leigh and Wigan to inform public health policy developments in this field.

2.0 Approach to the review

This rapid review was conducted to provide a brief summary of evidence relating to green space use and its impact on health and physical activity. Our approach involved a review of the literature investigating the links between the outdoor environment and health. Peer-reviewed (eg NICE), published literature was given preference over grey literature, alongside evidence from reputable sources such as CABE.

Due to limits on time and resources, a systematic review of the literature has not been conducted, and individual studies have not been assessed on methodology or sample size.

3.0 Access to green space

Research shows that the percentage of green space inside a one kilometre and a three kilometre radius of residential housing has a significant relationship to the perceived general health of a local population and this relationship is stronger for lower socioeconomic groups (Maas et al 2006). A study by Coombs et al (2010) found that reported frequency of green space use declines with increasing distance from home.

Bird (2004) identified that local access to safe natural green space and attractive scenery within 2 kms of home and with a good surface with no obstructions such as stiles is associated with high levels of physical activity either where the green space is a destination within walking and cycling distance or as a place to be active (Bird, 2004).

The National Playing Fields Association (now known as Fields in Trust) (2001) recommends that playing fields (or sports and recreation grounds or other local outdoor facilities) should be within three-quarters of a mile (1.2km) of where people live but also added that facilities should be 'close to home, workplaces, shops and schools'. According to Sport England (2001) accessibility to facilities should be within 20 minutes travel by foot in urban areas or 20 minutes by motorised transport in rural areas (National Heart Forum, 2007).

Research has shown that the majority of people (78%) visited their nearest green space on foot, although people travelled further in order to access a higher-quality

park, for instance with a Green Flag¹ award (CABE, 2010a). This supports research by Mitchell & Popham (2008) which found that if a local area has high quality parks, it is likely that more residents will use them more often, people are more satisfied with their neighbourhood and are more likely to report better health (CABE, 2010a). When people value their local green space and feel safe in it, they use it more and are more physically active. Almost half (46 per cent) said they would use their local green space more if it had better facilities.

NICE (2008) found evidence that a supportive built environment was important in encouraging activity across all age groups. NICE recommendations included the prioritisation of the need to be active for all including those with impaired mobility and access to safe, attractive and welcoming public open spaces on foot, by bicycle and using other modes of physical activity. NICE also recommended ensuring that public open spaces and paths including coastal, forest and riverside paths and canal towpaths are well-maintained to a high standard.

Donovan & Giles-Corti, (2002) noted that access to a supportive environment may need to be accompanied by strategies that aim to influence individual and social environmental factors to support participation in order to increase community recreational activity levels.

4.0 Benefits of green space

A growing body of robust research identifies that high quality green space brings considerable benefits to the local economy, to people's physical and mental health and to the environment (CABE, 2010c; NICE, 2011).

4.1 Green space and health

Regardless of economic circumstances, access to green space is considered to be beneficial to health. Exposure to parks, open countryside, gardens and other green spaces) has generally been found to have positive benefits for mental and physical health (Pretty 2007). William Bird (2004) noted that for every 10% increase in green space there was a reduction in health complaints equivalent to a reduction of 5 years age.

The Urban Green Spaces Taskforce (2002) found health benefits associated with good quality parks and green spaces in terms of reducing obesity, decreasing the risk of coronary heart disease and strokes and reducing daily stress (Grahn & Stigsdotter, 2003). Further research into green space has

¹ The Green Flag award scheme is one measure of the quality of green space, specifically parks. Between 08/09 and 09/10 there was an increase in the number of parks with green flags (from 487 to 594) (CABE, 2010c).

supported these findings and shown green spaces to be associated with decreased blood pressure, lower cholesterol (Maller et al, 2005), a decrease in health complaints (de Vries et al, 2003) and perceived better health (Mass et al, 2006). Ellaway et al (2005) found that residents in high 'greenery' environments were 40% less likely to be overweight and obese as those in the lowest greenery category.

According to Boyce et al (2009) there is strong evidence that the provision of green space effectively improves mental health. However, Lee and Mateswaran (2010) noted that there is a lack of robust evidence to support this, since much of the research into the psychological benefits of green space tended to be qualitative or from grey literature. This may be due to the inherent difficulties in quantifying non-physical health benefits.

NICE (2011) found evidence that green space also encourages social contact and integration, provides space for physical activity and play, improves air quality and reduces urban heat island effects².

4.2 Green space and health Inequalities

A large-scale UK study of patient records clearly showed that green space can help to reduce health inequalities. In areas with higher levels of green space there was a 25% lower all-cause mortality compared to areas with little green space (Mitchell & Popham, 2008).

People living in deprived urban areas view green space as a key service and one of the essentials in making a neighbourhood liveable (CABE, 2010a).

The Marmot review (2011) looked at the evidence on the relationship between aspects of spatial planning, the built environment, health and health inequalities. It found that people living in the most deprived neighbourhoods were more exposed to environmental conditions which negatively affect health. It found 'green and open space' was one of six areas that had a significant impact on health and socio economic status. The more disadvantaged a community, the more likely they are to lack good quality open space, easy walking and cycling routes, well located services and good housing mix and design. They are also more likely to experience environmental burdens such as pollution and crime.

CABE (2010b,c) also identified that the provision of green space is worse in deprived areas than in affluent areas. Houses in deprived areas often do not have gardens and so access to good-quality public green space matters even more. The most affluent 20 per cent of wards have five times the amount of

² The urban heat island is a metropolitan area, which is significantly and consistently warmer than its surroundings areas. This is usually caused by a combination of urban development, which uses materials that retain heat, and waste heat generated by energy usage of the local population.

parks or general green space (excluding gardens) per person than the most deprived 10 per cent of wards. People who are not working because of unemployment or sickness, tend to be found in areas with lower quantity and quality of green space. The study found that limiting longer-term illness or disability is associated with lower satisfaction with neighbourhood, lower quality of parks service, lower parks use and much lower physical activity.

This supports previous findings by the National Heart Forum (2007) specifically in relation to parks, which found a prevalence of 'poor' parks in poorer urban areas and a study by Jones et al (2009a) which found that groups with a lower income had less access to public parks. In the most deprived wards, where quality of green space provision is lower, only 40 per cent of adults engage in moderate physical activity, compared with nearly 60 per cent in the most affluent wards (CABE, 2010c). However, Jones et al (2009b) found that respondents in more deprived areas lived closer to green spaces, but reported poorer perceived accessibility, poorer safety, and less frequent use. Frequency of use declined with distance but only in the most affluent areas. Overall, the accessibility of green spaces was better in more deprived areas but those residents had more negative perceptions and were less likely to use the green spaces. (Jones et al, 2009). According to CABE (2010a) less than 1% of those living in social housing reported using the green spaces in the housing estates they lived in which may be due to concerns about safety, lack of access or poor quality.

The strong correlations between poor quality and quantity of spaces in deprived areas, and the low levels of physical activity of residents, strongly suggest that investing in the quality of parks and green spaces is an important way to tackle inequalities in health and well-being (CABE, 2010c). One way this is being addressed is through the Neighbourhoods Green partnership³. This looks at the development of a 10-point action plan to support social landlords to look at how they can provide more opportunities for people to enjoy the space on their doorsteps (CABE, 2010b). This supports the Marmot review which recommended 'improved good quality open and green spaces' and 'active travel' as part of the policy actions to address the inequalities in environmental conditions faced by people living in more deprived neighbourhoods.

CABE (2010c) also identified that people from minority ethnic groups tend to have less local green space and the space available is of a poorer quality. Specifically, areas that have a population with less than 2% from black and minority groups have 6 times as many parks and in total 11 times more green space than wards with over 40% of people from black and minority ethnic groups. However, the situation is slightly more promising for recreation grounds and playgrounds: with a relatively high level of provision of recreation grounds in areas with a black and minority population of between 6-20% and playground provision is high for wards with a population of between 11-40% from black and

³ The Neighbourhoods Green partnership is currently supported by CABE, the National Housing Federation, Natural England, Peabody, Green Flag Plus Partnership, Groundwork UK, Landscape Institute and the Wildlife Trusts.

minority ethnic groups. According to CABE (2010a), perceptions of safety was the most important barrier to the use of green space and this differed between ethnic groups. Only 53% of Bangladeshi people reported feeling safe using their local green space compared to 75% of white British people. However, Bangladeshi people along with Indian and Pakistani people were more likely to visit urban green spaces for physical activity than white British people, who were more likely to visit for relaxation. Indian people reported the highest perceived benefits if their local green spaces were improved. Whilst physical activity did not feature highly in people's current use patterns, 52% said they would do more physical activity if green spaces were improved (CABE, 2010a).

Green space was also shown to play a role in easing racial tensions and bringing diverse groups together, for instance to play football or cricket, and promoting integration by providing space for organised and casual encounters with neighbours and different ethnic groups.

4.3 Green space and physical activity

According to Bird (2004) some of the health benefits associated with green spaces are due to increased opportunity to take part in physical activity in a favourable environment. Access to outdoor play and adventure in natural settings has been shown to contribute to increased physical activity and fitness, positive views towards physical activity and improved healthy wellbeing through childhood and adulthood (Travlou, 2006). Lee and Mateswaran (2007) noted that most studies have consistently reported the association between ease and convenience of access with either higher levels of structured or unstructured physical activity.

Bauman & Bull (2007) also found reasonably consistent associations between physical activity levels and the accessibility of green space and other facilities, the density of residential areas, land use mix, urban 'walkability' scores, the perceived safety of an area and the availability of footpaths or equipment for exercising. A study by Coombs et al (2010) found that people living closer to green spaces, specifically formal parks were more likely to be active at the recommended level for health. This supported earlier findings by Ellaway et al (2005) which showed that residents in high 'greenery' environments were 3.3 times more likely to take frequent physical exercise as those in the lowest greenery category.

Two reviews (Humpel et al, 2002; Owen et al, 2004) found that levels of total walking at the recommended level for health are more likely to be met when there is: Local access to public space and a local area which is attractive with enjoyable scenery; safe footpaths; minor traffic with trees; pavements; diversity of land use; easy access to public transport and the neighbourhood is friendly.

Further research found that people with access to attractive and large public open spaces were 50% more likely to have high levels of walking (defined as at least six walking sessions per week, totalling 180 minutes) (Giles-Corti et al. 2005).

Maas et al (2008) found a positive relationship between green space and gardening and cycling for commuting purposes. However, the study also found that the amount of green space has little influence on people's overall level of physical activity. The percentage of green space in people's living environment was not related to people meeting the public health recommendations for physical activity or their participation and amount of time spent doing sports activities or walking for commuting purposes. Maas also added that the amount of physical activity taken in greener environments does not explain the relationship between green space and health.

5.0 Use of green space by population groups

Several studies observed variations in green space use by different age groups but the findings are inconsistent. Gender differences in green space use have also been reported.

5.1 Children and young people

For children, outside space provides the opportunity for them to engage in active play. Evidence demonstrates that one of the best ways for children to stay both physically and mentally healthy is through access to a variety of unstructured play experiences (Play England, 2008). A review by the Greater London Authority/London Health Observatory (2001) found that access to open space can increase levels of exercise in a community, especially for children, improving social interaction and community activities. Being outdoors was found to be the most powerful correlate of physical activity, particularly in pre-school children (Baranowski, 1993). Mackett et al (2004) showed that walking and playing provide children with more physical activity than any other activities. They also found that encouraging children to be outside increases their activity and that a shift from unstructured to structured activities encourages car use (National Heart Forum, 2007).

According to Sallis et al (1995) children's physical activity levels are also associated with the number of play spaces near their homes and the amount of time children use those play spaces. However, Potwarka (2008) found that it was not necessarily access to green space but the facilities provided in the green space that had the most significant benefit on physical activity levels and healthy weight status of children. A further study by Den Hertog et al (2006) found that a

local park of good quality stimulates active behaviours, especially for children. Bird (2004) suggested that local green space within walking distance is vital to maintain physical activity levels in children.

Barby et al (2007) reported that teenagers living in disadvantaged neighbourhoods lacked access to parks they considered safe and were therefore less likely to participate in physical activities than teens in more affluent neighbourhoods. According to Power et al (2009), it should therefore be ensured that play areas are safe, and that there is a park or small supervised (overlooked) play area within 4 minutes walk of every family home (NICE, 2011, accessed 03/08/11). Earley (2007) recommended that playing fields (or other local outdoor facilities) should be within $\frac{3}{4}$ of a mile of where people live and of high quality.

5.2 Adults

Many of the studies referred to in this document have been conducted on the adult population so when considering evidence impact on the adult population we must also consider evidence referenced elsewhere in this review.

Richardson and Mitchell (2010) conducted the first large scale UK-wide study of the relationship between urban green space and health, and the first such study to investigate gender differences in this relationship. The report, which involved an estimated 29 million working age adults found that male cardiovascular disease and respiratory disease mortality rates decreased with increasing green space (men living in the greenest neighbourhoods were about 10 per cent less likely to die prematurely), but found no significant associations for women. Possible explanations for the observed gender differences may be down to the fact that men and women view and use green space in very contrasting ways.

Men were more likely to take vigorous exercise in green space than women, who perhaps view green space as somewhere to take their children. Studies have shown that women can be discouraged from using green space because they view these areas as unsafe. Another study in the UK showed that for women, walking over 150 minutes a week was associated with them 'feeling safe' and having 'access to shops', but for men it was associated with 'access to a park or open space' (Foster et al, 2004). King et al (2003) found that women living within walking distance of a park or footpath walked more (as measured by a pedometer) than those living near a community centre, pub, bar, coffee shop, post office or library.

Hillsdon et al (2006) also found that access to urban green spaces does not appear to be associated with population levels of recreational physical activity in middle-aged adults. This was further supported in a study by Foster et al (2009) which found that access to green space and area levels of crime were *not*

associated with walking for recreation for adults. Distance to facilities had either no or only a small effect on the uptake of different activities.

5.3 Older adults

Takano et al (2002) conducted a study into the importance of walkable green space for older adults. The study concluded that “living in areas with walkable green spaces positively influenced the longevity of urban senior citizens independent of their age, sex, marital status, baseline functional status, and socioeconomic status”.

Research has found that older adults need to be within 5–10 minutes’ walking distance of local shops and amenities, need to feel secure and safe from traffic and other threats, and should have access to well maintained walkways and pleasant green spaces (Department of Health, 2011).

6.0 Green space and conservation

Using green space for conservation or gardening provides another opportunity for physical activity. Activities in which exercise becomes secondary to environmental or social benefits (e.g. cycling, gardening, Green Gym, walking in green space) appear to be more sustainable than activities in which exercise remains the primary driver’. Nature is considered to be a major motivating factor for physical exercise.

Health benefits have been found to be associated with a number of conservation programmes including ‘Green Gyms’. These were established by the British Trust for Conservation Volunteers (BTCV) and widely replicated by local authorities and other organisations. Green gyms involve volunteer officers taking participants, on a regular basis, through a set of practical projects dictated by the environment they are working in. These ‘outdoor jobs’ are designed to help improve the strength and stamina of the gym members, give them practical experience and skills and change their local green spaces for the better. Independent research has shown that Green Gym participants gain physical benefits from their exercise, including better long term health and mental health benefits such as increased confidence and better sleep and lower levels of anxiety (Yerrell, 2008).

Another programme, The Green Exercise Programme⁴, was funded by Natural England with the aim of targeting sedentary people and increasing their physical

⁴ Natural England funded eight, three year pilot projects through local partnerships in the regions between 2008-11 to test the process of engaging hard to reach groups in green exercise activity. The eight projects adopted very different approaches to delivering green exercise but enabled approximately 18,000 people, approximately 8,000 children and 10,000 adults, within the target groups, to access and experience their local greenspaces.

activity and their connection to local green spaces. Research showed that the programme was successful in engaging a variety of hard to reach groups to access local green spaces through a range of varied project interventions. Whilst the long-term impact on behaviour is unclear, the programme has shown that accessing local green space and having a positive environmental experience leads to other benefits including improved health and well-being, increased physical activity, community cohesion and action to conserve and improve local green spaces (Hynds, 2011).

Additionally, contact with nature has been found to have a beneficial effect on health (Maller et al, 2002). A good design of wildlife-rich gardens has also been found to be beneficial to the whole population including those in hospitals or residential care homes (Bird, 2004).

7.0 Key issues in relation to green space

7.1 Spatial planning for health

For many years the link between physical development and health was dismissed by planning legislation as 'not a land use issue'. The role of spatial planning has now widened and its role to support and promote healthier communities is increasingly recognised (Healthy Urban Development Unit (HUDU), accessed 030811). The HUDU have produced a manual to support PCTs and local authorities to make the most of the spatial planning opportunities. Green space is relevant to many of the National Indicators applied to Local Area Agreements (LAAs) in England. Green space supports LAA targets relating to Stronger Communities, Children and Young People, Adult Health and Wellbeing and Environmental Sustainability. For example, increasing provision of, and access to, safe, clean green space can improve scores for National Indicator 5 (overall/general satisfaction with local area) and National Indicator 188 (adapting to climate change). Whilst this provides an opportunity to integrate green space planning into local government policy, a recent NICE Systematic Review (2011) looking at the integration of health in spatial planning documents found little evidence of health issues in Local Development Frameworks although there was some evidence? in environmental policies of Regional Spatial Strategies. There was also limited evidence of post implementation results or monitoring where policies were in place due to a shortage of resources (NICE accessed 030811). This review formed part of a series of reviews by NICE (2011) on 'spatial planning for health', whilst these will no longer be translated into public health guidance, they are still valuable reference documents

(<http://www.nice.org.uk/guidance/phg/SpatialPlanningInfo.jsp>).

In 2011, the government announced a review of planning policy in order to produce a single National Planning Policy Framework. HUDU has responded to

suggest that it should fully embrace health and well-being as a key element of creating sustainable communities.

7.2 Parks and green spaces

Ten years ago the decline in quality of urban green space was a cause for concern. However, the creation of CAGE space as a champion for urban green space identified that the higher the quality of green space the more it is likely to be used. This led to initiatives including Parkforce, which encourages LA to put staff back into public parks who can then support other physical activity initiatives like Green Gyms. People are now using their parks more and consequently valuing them more (CAGE, 2010c).

7.3 Outdoor facilities for sport and recreation (including play)

Outdoor facilities still remain at risk from sale. Capital investment in indoor facilities is considered sufficient justification for the sale of outdoor facilities where the quality of the facility has declined due to a lack of investment. Investment needed for indoor facilities far outweighs that needed for outdoor facilities. Local authority playing fields held for public use do not have the same protection and reinvestment as afforded to school playing fields (National Heart Forum, 2007). However, research in the UK has shown that people who took part in outdoor exercise programmes more often complete the programme than people who participate in indoor exercise programmes (Pretty et al, 2007).

8.0 Cost effectiveness of green space

The Faculty of Public Health in their recent publication Great Outdoors (2010) note that 'Safe, green spaces may be as effective as prescription drugs in treating some forms of mental illnesses'.

Estimating economic values for public health interventions is problematic, but not impossible. Recent work has shown that where people have good perceived and/or actual access to green space they are 24% more like to be physically active (Coombs et al). If this effect was universal and the population of England had equitable good access to green space, it is estimated that the life-cost averted saving to the health service is around £2.1 billion per annum (Natural England 2009).

According to Bird (2004), a park in Portsmouth, for example, could, annually, save the economy £4.4 million, including £910,00 to the NHS. A 3km footpath on the edge of Norwich would save the economy £1 million, including £210,00 to the NHS.⁵

The health and economic benefits of active travel have been found to outweigh the costs by up to 11 times. Cost ranged from £90 to £25,000 per QALY (Lewis et al, 2010).

Economic modelling commissioned by Cycling England has calculated that a 20% increase in cycling by 2015 would save £107 million in reducing premature deaths, £52 million in lowered NHS costs and £87 million by decreasing absences from work (Macdonald, 2007).

In relation to walking, Bird (2004) estimates that in England, if a group of 120 healthy individuals aged over 60 years started to walk 2 miles per day, then over 10 years there would be approximately 20 less deaths, 7 less heart attacks, 3 less strokes, 2 less new diabetics, and 13 less people with some disability from osteoarthritis of the knee when compared to an inactive group; in other words 2 deaths per year could be saved.

Natural England (2009) has estimated the value of the expanded Walking for Health Initiative over a 3 year period as:

- 2817 Quality Adjusted Life Years (QALY) delivered at a cost of £4008.98 per QALY.
- Savings to the health service of £81,167,864 (based on life-cost averted).
- A cost-benefit ratio of 1:7.18.

According to Natural England (2009), if the data was available that allowed for the full financial costs to be considered across the range of delivery partners, it is still highly likely that the models would show WHI to be cost-effective, with substantial life-cost averted savings and a high cost benefit ratio.

Evaluation of the Bristol Play Pathfinder programme (2011) has estimated the value of the programme as 20.25 QALY, with a total value of the health benefits of play in the Play Pathfinder areas at £1,447,875.⁶

⁵ These estimates are based on an urban park providing 20% of total local physical activity provision and a 3km footpath providing 16% of total local physical activity provision, and are dependent on the population (density) who can access the green space.

⁶ seventy six percent of children were engaged for more than thirty minutes daily in active play. It was estimated that over 250 children were physically active for more than half an hour daily, which is equivalent to 7500 hours of exercise in a month

9.0 Case Studies

9.1 Dudley Healthy Town Project (Parks)

Dudley Healthy Towns project was established in 2009, with 3-year funding totalling £4.5million allocated from the governments Healthy Community Challenge fund. This fund was set up to support innovative ways of making the environment more conducive to physical activity and healthy eating. Dudley was one of 9 towns/cities across England who was successful in their bid.

Dudley Healthy Towns project was designed to encourage families to make the most of the outdoor areas by transforming five of the borough's parks and play areas into healthy hubs. Each hub has a free outdoor gym, a Healthy Town building and a dedicated park ranger. Hubs are located throughout the borough.

The funding is also being used to make active travel corridors, making it easier to cycle and walk safely across the borough. Whilst learning from all 9 Healthy Towns will be available towards the end of 2011, testimonials from local residents, below, show the initial effects of this programme.

"I think the outdoor gym is absolutely great for me as a parent who hasn't got time to go to the gym"

"I am a 68 year old male who had a heart attack followed by a triple bypass operation in 1997 and I am conscious of the need to keep fit myself. The outdoor gym is a huge benefit to the population and myself in particular"

<http://www.dudleyhealthytowns.co.uk/>

9.2 Doncaster Green Gym (Green Gym)

Volunteering to take part in practical environmental conservation has proved a life changing experience for members of the Doncaster Green Gym.

Referred by social and health care organisations throughout the Borough, many have learning difficulties, mental health problems or restricted mobility.

Time and again, the chance to interact with new people, acquire practical skills and get tangible results has helped Green Gym members to tackle issues such as depression, isolation and low self-esteem.

Around 2000 people have joined the Gym since it was set up in 2004, Through activities such as woodland management, bird and bat box making, dead

hedging and canal digging, they help to maintain and improve Community Woodlands created from old colliery workings across South Yorkshire.

Green Gym members' confidence and ability to undertake tasks have increased dramatically over time, with three individuals nominated for BTCV's Better Lives awards in 2008. Some have now moved onto other projects within the community, even taking leadership roles – something that was unimaginable when they first started.

<http://www2.btcv.org.uk/Case-study-GGDonc.pdf>

9.3 Cumbria – integrated health walks at GP surgeries

New GP surgery health walks in Cumbria are an inspired response to organisational changes in the health sector. GPs management of their own budgets provides an incentive to improve health without medication.

In two medical centres, health walks have become an integrated part of what the surgery offers and incur no costs.

A GP practice near Penrith has set up a fortnightly health walk from the surgery with the receptionist trained as a WfH walk leader. The doctors refer patients onto the walks, which are publicised in the waiting room.

In the south of the county, a newly established surgery walk is proving popular. The Practice Manager arranged training for two patients who were keen to become walk leaders and each now leads a walk once a fortnight.

These walks are sustainable because they are guaranteed participants and they have no overhead expenses. New health funding arrangements mean that GPs will be more protective of their budgets and looking at alternative ways to improve health.

'Where there are no local health walks, Natural England is now looking to GPs to set them up. Health professionals are increasingly aware of the benefits of walking and this could be a sustainable way of developing health walk schemes for the future' Chris Pantechis, Natural England/WfH North-West team
November 2010 <http://www.wfh.naturalengland.org.uk/case-story/cumbria>

9.4 Bristol Play Pathfinder Programme (2011)

The Play Pathfinder programme was launched by the former DCSF (2008) to honour their commitment in the Play Strategy to improve and develop play spaces. Bristol was one of 30 local authorities who secured £2million capital

funding to develop 28 play spaces and 1 adventure playground over a three-year period. The programme was designed to enable more children to undertake greater physical activity; increase social integration; engage in experiential learning through actively engaging with improved play environments across the city of Bristol and communicate and disseminate the results of the evaluation effectively to all stakeholders.

The following is a summary of investments and deliverables of the project.

Year 1 (08/09) funding was successfully invested in twelve play sites - four Adventure play grounds, two destination parks and six local parks.

Year 2 (09/10) Eighteen sites were delivered in year 2: One Adventure playground, one destination park and sixteen local parks

Year 3 (10/11) The final year of pathfinder, comprised a £123k former funded revenue programme which supported a range of events and training including completion of the Pathfinder Play Watch and Play Training programmes.

The University of West England, Bristol was appointed to conduct an independent review of the programme by Bristol City Council in order to determine the impact and effectiveness of changes made to the existing play spaces in Bristol to meet the priorities of their play strategy Playing For Real (2003)

Key Findings: A snapshot

- **Access and Inclusion:** 96% of respondents concurred that the play space is accessible by foot and bike and 94% agreed that children could easily find their way around the play area.
- **Degree of inclusiveness:** 65.8% agreed that the play areas were accessible to both disabled and non-disabled children; 68.5% of participants were positive that the play areas attract children and parents from ethnic minority background.
- **Risk, safety and play:** 60.4% of participants were positive about the ability of the play areas to offer a variety of on-site adult supervision, although 54.7% felt that the feeling of safety would be increased if the area were staffed by play workers.
- **Usage and perceptions of play areas:** 93.3% of respondents were positive about the good balance between play equipment and space for free play; 69.2% of participants confirmed that their child played more often in the new playgrounds.
- **Physical activity and play:** Over 41% of children played more than an hour a day, as result of the improvements to the play areas in Bristol Play Pathfinder case studies.

http://www.goplacestoplay.org.uk/uploads/File/Final%20draft%20pathfinder%20atest_1_04_11-1.pdf

9.5 Broadway Community Garden, Essex (Social Housing)

Tilbury community garden on the Broadway estate was developed on a site that had been blighted by antisocial behaviour.. Most residents on the Broadway Estate wanted to leave the area and no outsiders visited the estate. Tenants felt undervalued and ignored, and the buildings and public spaces were in a state of disrepair. The resident population changed on a regular basis, as new tenants moved in, including a significant number of families from the traveller community. The Broadway Estate lacked public space and residents did not identify with the estate that they lived in.

The site of the community garden had been a bleak, flat area of grass with a small playground in the centre of 189 houses, 36 sheltered flats and 192 flats in 3 high rise towers. The Broadway Residents and Tenants Associations (BRATS) proposed that the underused space at the centre of their estate was transformed into a shared open space for local people. In 1998 the Broadway Multi-Agency Partnership formed, consisting of a housing officer, residents, the local council and the local police, and successfully bid for Single Regeneration funding to improve their local area. The partnership proposed a community garden that was innovative and inspired the residents and which could radically transform the crime hotspot into a much needed recreation space for the local community.

In 2001 BRATS produced a brief to create a community garden including facilities for play and a place for all residents to relax and socialise. Residents were consulted and their ideas which included the presence of horses and the travelling heritage were incorporated into the design process. The result was a community garden with three separate sections; one for the use of horses, a large central space for football and another for play equipment that is divided for older and younger children. Paths separated the different areas. The edges of the site were made of rubble and earth filled cages planted with grass and wild flowers, at different levels, giving views across the site to maximise safety. A park warden was also employed to look after the park and facilitate events for the community, especially young people.

Whilst there were some problems with maintenance especially on the site for horses, residents from the estate were happy the garden was built. If the garden had not been a success houses and flats would have been built on the site, leaving the estate with no green area. As Linzi Leslie, a resident on Broadway Estate said 'We need a park, if you build houses where are the kids going to hang around?'

Consultation with local people was a crucial part of the design process and has resulted in a popular and well-used community garden designed to meet the needs of local people. It has also led to the reduction of crime in the area.

<http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/case-studies/broadway-community-garden/evaluation>

10.0 Conclusions

Green space is widely available across England, but despite the increase in usage of parks in recent years, much green space still remains underused (especially in deprived communities) due to a range of factors including access, quality and safety. Indeed the review demonstrates that, whilst there is some debate around the characteristics of the environment which encourage an increase in physical activity, safety and access remain common features affecting people's use of green space.

Whilst there are inconsistencies between the research findings, we believe that here is sufficient robust research programmes and evidence led reviews to conclude that access to safe high quality green space is beneficial to both health and physical activity levels. This is strongly reflected by NICE reviews and research by Bird (2004) who concludes that local access to safe natural and attractive green space is associated with high levels of physical activity within communities.

A 'dose-response' relationship between exposure to natural spaces and health is generally suggested across peer reviews – the more green space there is in a neighbourhood, the better people's health is. Exposure to natural spaces has also been found to have a restorative function with regards to mental health and well-being

Investment in parks and green spaces should be seen as an investment in Public Health. The review has found clear evidence that those living in deprived neighbourhoods access green space far more infrequently than those from more affluent neighbourhoods. Within this, black and minority ethnic groups and those socially disadvantaged have less access to high quality, safe green space. Therefore improving green space in deprived, urban areas has the potential to benefit those who have the most to gain.

The balance of evidence suggests that it is important not to assume uniform health benefits of urban green space for all population subgroups. Whilst all high quality green space is valuable to local communities, there should not be a 'one size fits all' approach to designing and developing green spaces; a lack of use by teenagers for example has been attributed to a lack of consideration of their needs in the planning of parks. The consultation and involvement of the community is therefore key in ensuring that the space is 'fit for purpose' and valued by the community. The needs of females also need to be considered within any green space strategy and there are clear strategies and principles of healthy design and interventions to meet the needs of different population groups

Local authorities and Primary Care Trusts are in a good position to identify and improve communities that are poorly served by good quality green space and parks in order to address inequalities in health. The Joint Strategic Needs Assessment (JSNA) provides a significant opportunity for local authorities and current PCTs to work together in the planning of healthy urban spaces (HUDU, 2011).

This review concludes that access to good quality green space provides an effective, population-wide strategy for the promotion of good health, wellbeing and quality of life. However the majority of the health benefits associated with green space are long-term; therefore to be successful any initiative needs to be independent of financial or political cycles of administration and should be seen as a long term investment (Greater London Authority/London Health Observatory (2001).

‘A mass shift in current activity levels is needed. This will only be achieved if people see and want the benefits but also if opportunities are created by changing the physical and cultural landscape – and building an environment that supports people in more active lifestyles’
(Chief Medical Officer 2004)

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